

**Appendix E Attachments to Comment Letter From  
Kern Water Bank Authority**

---



# State Water Resources Control Board



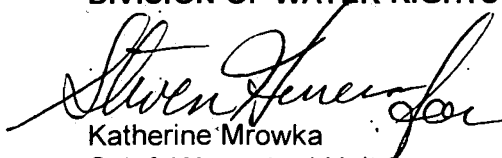
Linda S. Adams  
Secretary for  
Environmental Protection

Division of Water Rights  
1001 I Street, 14<sup>th</sup> Floor ♦ Sacramento, California 95814 ♦ 916.341.5300  
P.O. Box 2000 ♦ Sacramento, California 95812-2000  
Fax: 916.341.5400 ♦ www.waterrights.ca.gov

Arnold Schwarzenegger  
Governor

## MEMORANDUM

TO: Victoria A. Whitney, Chief  
DIVISION OF WATER RIGHTS

FROM:   
Katherine Mrowka  
Chief, Watershed Unit 3  
DIVISION OF WATER RIGHTS

DATE: OCT - 2 2008

SUBJECT: PETITIONS TO REVISE STATUS OF KERN RIVER ON STATE WATER BOARD FULLY APPROPRIATED STREAMS LIST

In accordance with California Code of Regulations, title 23, section 871, five petitions have been filed with the State Water Resources Control Board (State Water Board), Division of Water Rights (Division), requesting revision of the Kern River's fully appropriated status as declared in Order 89-25 and subsequent orders, the Declaration of Fully Appropriated Streams (collectively "the Declaration"). The five petitions were received from: (1) North Kern Water Storage District (North Kern) and City of Shafter; (2) City of Bakersfield; (3) Buena Vista Water Storage District; (4) Kern Water Bank Authority; and (5) Kern County Water Agency (Petitioners). The Petitioners also filed applications to appropriate water.

The Petitioners cited the Fifth District Court of Appeal's decision in *North Kern Water Storage District v. Kern Delta Water District* as the basis for filing the petitions. The Fifth District's ruling found that there was a partial forfeiture of Kern Delta Water District's (Kern Delta) pre-1914 water rights on the Kern River.

### Background

#### *Water Rights on Kern River*

Water diversions from the Kern River for agricultural and domestic purposes date back to the 1860's. The historical administration of the water rights on the Kern is based on the concept of "the law of the river," which refers to the body of decrees, agreements, customs and practices that came into existence over the history of disputes on the river. Those court decisions and agreements of interest are:

- 1) Decision of the California Supreme Court in *Lux v. Haggin* (1886) 69 Cal. 255;
- 2) *Farmers Canal Company v. J.R. Simmons* (Super. Ct., Kern County, 1900, No. 1901), commonly known as the Shaw Decree
- 3) Miller-Haggin Agreement, 1888;

TURNAME

  
KAM 10/2/08  
Bulloek 9/29/08  
KAM 9/2/08

Recycled Paper

VAW 10/10/08

AR001887



- 4) Amendment to the Miller-Haggin Agreement, 1930;
- 5) Amendment to the Miller-Haggin Agreement, 1955;
- 6) Kern River Water Rights and Storage Agreement, 1962;
- 7) Lake Isabella Recreation Pool Agreement, 1963; and
- 8) Other more recent court cases further discussed below

For the past 100 years, the major users of water from the Kern River have relied upon the original division of water in the various agreements and decrees and have been contracting and interchanging Kern River water among themselves. In most cases, water disputes have been settled out of court by agreement among the disputing parties.

A relatively small portion of water presently diverted from the Kern River and its tributaries is based on post-1914 water rights. The extent and validity of the pre-1914 water rights have been challenged in court, which led to the finding of partial forfeiture of Kern Delta's water rights. (*North Kern Water Storage District v. Kern Delta Water District* (2007) 147 Cal.App.4th 555.) The present distribution, use, and basis of water rights in the Kern River is complex and based on the various decrees and agreements. As of this date, a definitive quantification of the extent and validity of all water rights on the Kern River has not been undertaken.

#### *Kern River's Fully Appropriated Stream Status*

Pursuant to Water Code sections 1205 through 1207, the State Water Board has adopted and periodically revised the Declaration. The Declaration includes a list of stream systems that have been found to be fully appropriated for all or part of the year based on court decisions or decisions of the State Water Board. The Kern River stream system has been found to be fully appropriated throughout the year from the Buena Vista Sink upstream, including all tributaries where hydraulic continuity exists in Kern County. The Kern River system was included in the original Declaration adopted by State Water Board Order WR 89-25, and it remains listed on the most recent revised Declaration adopted with State Water Board Orders WR 91-07 and WR 98-08. Order 89-25 cited State Water Rights Board Decision 1196 (D1196), issued on October 29, 1964, to include the Kern River on the Declaration. Specifically, D1196 found that, "there was no showing that there is unappropriated water available" in the Kern River watershed. (D1196, p.5.)

#### Change in circumstances since issuance of D1196

Water Code section 1205(b) states that, "A declaration that a stream system is fully appropriated shall contain a finding that the supply of water in the stream system is being fully applied to beneficial uses where the board finds that previous water rights decisions have determined that no water remains available for appropriation." In substantiating the Kern River's status as fully appropriated, paragraph 7 of D1196 concluded that there was no water surplus to established uses in the Kern River, based on data included in the State Water Rights Board Engineering Staff Analysis of Record, dated May 28, 1964.

California Code of Regulations title 23, section 871, subdivision (b) states that the Division Chief may recommend a hearing to consider revision to the Declaration as follows: "The Chief's recommendation for revocation or revision may be based upon any relevant factor, including but not limited to a change in circumstances from those considered in a previous water right decision determining that no water remains available for appropriation, or upon reasonable cause derived from hydrologic data, water usage data, or other relevant information acquire by the Division of Water Rights in the course of any investigation conducted by it."

Following is staff's analysis regarding the change in circumstances from the information considered in D1196.

*Kern River-California Aqueduct Intertie*

The U.S. Army Corps of Engineers (Corps) constructed the Kern River-California Aqueduct Intertie (Intertie) as a flood control project in 1977. The Intertie diverts water from the lower Kern River near the City of Tupman, and its flood control function is intended to protect downstream agricultural lands on the Buena Vista Lake and Tulare Lake lakebeds. Absent the Intertie and upstream uses, Kern River flows would reach these areas and be used to irrigate crops, but as a result of upstream agricultural diversions and storage in Lake Isabella, these areas are usually dry, other than in years of very large runoff.

The Corps acknowledged that the Intertie was designed with the understanding that water would be diverted into the California Aqueduct and would be put to beneficial use via the State Water Project (SWP). The Department of Water Resources (DWR) operates the facility in accordance with an agreement among DWR, the Kern County Water Agency, and other water districts asserting water rights on the Kern River. The agreement limits Intertie diversions to flood flows *in excess of the needs of the districts claiming water rights on the Kern River*.

DWR diverted water through the Intertie in six different years between 1978 and 1988, in 1997 and 1998, and again in 2006. DWR has informed the State Water Board that it intends to use the Intertie more frequently over the next several years. The State Water Board has notified DWR of the necessity for it to obtain water rights for the Intertie diversions. However, DWR has questioned its need to obtain water rights.

In 1996, North Kern filed an action with the Tulare County Superior Court that sought a judgment that pre-1914 water rights acquired by Kern Delta in 1976 were partially forfeited by nonuse. (*North Kern Water Storage District v. Kern Delta Water District* (Super. Ct. Tulare County, 1999, No. 96-172919) hereinafter "the Conn Judgment.")

The Conn Judgment found that Kern Delta's pre-1914 water rights had been partially forfeited. The Conn Judgment also declared that Kern Delta's forfeiture resulted in an unspecified quantity of unappropriated water in the Kern River. In response to the finding of unappropriated water in the Conn Judgment, North Kern, the City of Bakersfield (Bakersfield), Kern Delta and others submitted petitions to the Division to request modification of the Declaration and accompanying applications to appropriate water from the Kern River.

The Fifth District Court of Appeal later reversed the Conn Judgment and remanded the case back to the Tulare County Superior Court. After a second trial, a second judgment was rendered. (*North Kern Water Storage District v. Kern Delta Water District* (Super. Ct. Tulare County, 2004, No. 96-172919) hereinafter "the Reed Judgment.") The Reed Judgment determined that as much as 60,895 acre-feet annually of Kern Delta's rights were forfeited.

On May 26, 2005, after the Reed Judgment but before the second appeal, the Division Chief issued a notice to North Kern, Kern Delta, Bakersfield and the other petitioners that their petitions and applications submitted in response to the Conn Judgment were rejected without prejudice. The notice indicated that new petitions and applications could be presented upon final resolution of the ongoing litigation. Bakersfield filed a petition for reconsideration that was rejected by the State Water Board with Order WR 2005-0017-EXEC. That order stated in

section 3.2, "Until the litigation determining the amount of water forfeited by Kern Delta is concluded with a final judgment, it is premature for the State Water Board to conduct a hearing on whether to revise the Declaration concerning the Kern River."

Ultimately, on April 25, 2007, the California Supreme Court denied petition for review. Therefore the Fifth District Court of Appeal's February 5, 2007 decision, is final. The Appellate Court judgment concluded that there was a partial forfeiture of Kern Delta's pre-1914 water rights. (*North Kern Water Storage District v. Kern Delta Water District* (2007) 147 Cal.App.4th 555.) The Court of Appeal further ruled that although the court determined water had been forfeited by Kern Delta's predecessors, the State Water Board was the proper body to determine whether the forfeiture would affect the status of the Kern River as fully appropriated pursuant to the Declaration.

Further, the Appellate Court judgment found that North Kern's argument that Kern Delta forfeited "water" was incorrect. Instead, the Court found that Kern Delta had actually forfeited "water rights" and stated,

If water rights are forfeited, however, the cumulative effect could be that the river is no longer oversubscribed. That is a determination not for the courts, but for the SWRCB. If those resulting limitations on appropriation might result in a determination that the Kern River is no longer fully appropriated, that determination will be made by the SWRCB on petition of a potential appropriator of the excess.

(*Id.*, at 583.)

#### Conclusion

Paragraph 7 of D1196 states, in part:

A comparison of the quantities of water used in the First Point, Second Point, and Lower River Service Areas for the period 1894-1963, with the quantities of water flowing past the first point of measurement, adjusted to eliminate the effect of Isabella Reservoir, shows that there is no water surplus to the established uses of the applicants, protestants, and other users in these areas.

Diversion of water to the California Aqueduct via the Intertie on numerous occasions since its construction in 1977 confirms that there has been a change in circumstances since D1196. Kern River flows in excess of the established uses of historical water right holders have been available, and excess water has been put to beneficial use through the SWP.

Further, the underlying basis upon which the petitions for revision of the Declaration were filed is that the courts have confirmed that water rights have been forfeited by Kern Delta. This also can be considered a change in circumstances since approval of D1196, because if those forfeitures are applied historically, it could be concluded that the water in the Kern River would not have been fully applied to beneficial use as described in D1196.

Because water rights have been forfeited subsequent to the determination under D1196 which in part was based on the pre-1914 water rights, it follows that the "established uses" referred to may have diminished as evidenced by the forfeiture. Further, Section 3.3 of WR Order 98-08 states in part,

Water Code section 1205 provides for revision of the Declaration under appropriate conditions. In the event that water becomes available for appropriation due to the revocation of a previously issued permit or license, the Declaration could be revised accordingly.

The information above shows there may have been a change in circumstances since D1196 was issued. Therefore I conclude that there is sufficient information to process the petitions and conduct a hearing on the question of whether the Declaration should be revised pursuant to title 23, California Code of Regulations, section 871, subdivision (b). Any action on the petitions would be for purposes of determining whether the Declaration should be revised, and no determinations on whether to approve the pending applications would be made until after the hearing resulted in a determination on whether the stream is fully appropriated.

Concur:

\_\_\_\_\_  
Victoria A. Whitney  
Division Chief

Date:

KMG:dcc: 08/26/08;jmtipps 09.25.08\kmg 10.02.08  
U:\PERDRV\KGaffney\Kern FAS memo 10-2-08.doc

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

ORDER WR-2010-0010

---

In the Matter of the Petitions to Revise the  
Declaration of Fully Appropriated Streams to Allow  
Processing of Applications to Appropriate Water from the Kern River

---

SOURCE: Kern River

COUNTIES: Kern and Tulare

---

ORDER AMENDING DECLARATION OF FULLY APPROPRIATED STREAMS  
TO REMOVE DESIGNATION OF THE KERN RIVER AS FULLY APPROPRIATED

BY THE BOARD:

**1.0 INTRODUCTION**

Pursuant to Water Code sections 1205 through 1207, the State Water Resources Control Board (State Water Board or Board) has adopted and periodically revised the Declaration of Fully Appropriated Streams (Declaration). The Declaration includes a list of streams that have been found to be fully appropriated for all or part of the year based on court decisions or decisions by the State Water Board. The Kern River system has been found to be fully appropriated throughout the year from Buena Vista Sink upstream, including all tributaries where hydraulic continuity exists in Kern County. The Kern River system was included in the original Declaration adopted by [State Water Board Order WR 89-25](#), and it remains listed on the most recent revised Declaration adopted by [State Water Board Orders WR 91-07](#) and [WR 98-08](#). Order 89-25 cited [State Water Rights Board Decision 1196](#) (D-1196), issued on October 29, 1964, as the basis for including the Kern River on the Declaration. D-1196 was based on the fact that “there was no showing that there is unappropriated water available” in the Kern River watershed. (D-1196, p.5.)

In 2007, in accordance with California Code of Regulations, title 23, section 871, five petitions were filed with the State Water Board, Division of Water Rights (Division), requesting revision of the Kern River’s fully appropriated status as listed in the Declaration. The five petitions were

received from: North Kern Water Storage District and City of Shafter, City of Bakersfield, Buena Vista Water Storage District, Kern Water Bank Authority and Kern County Water Agency (Petitioners). Petitioners also filed applications to appropriate water. Petitioners cited the Fifth District Court of Appeal's decision in *North Kern Water Storage District v. Kern Delta Water District* (1997) (147 Cal.App.4<sup>th</sup> 555 [54 Cal.Rptr.3d 578]) (North Kern Decision) as the basis for filing the petitions. The Fifth District's ruling found that there was a partial forfeiture of Kern Delta Water District's (Kern Delta) pre-1914 water rights on the Kern River.

## 2.0 BACKGROUND

California Code of Regulations, title 23, section 871 provides that the State Water Board may revoke or revise the Declaration upon its own motion or upon petition of any interested person. In this instance, the Board received the petitions from the above-named entities to revise the Declaration. In a memorandum dated October 8, 2008, the State Water Board Deputy Director for Water Rights concluded that there was sufficient information to process the petitions and conduct a hearing on the question of whether the Declaration should be revised. The Board held a pre-hearing Conference on September 24, 2009. The purpose of the pre-hearing conference was to receive comments from the parties and other participants on the scope of the hearing, the status of any negotiations to resolve protests, and any other appropriate procedural issues. Representatives of the following parties participated in the pre-hearing conference: Kern County Water Authority, Buena Vista Water Storage District, North Kern Water Storage District, Kern County Water Agency, City of Shafter<sup>1</sup> and the City of Bakersfield.

The primary concern of the parties raised at the pre-hearing conference was the scope of evidence that would be considered in this proceeding. In his letter of September 25, 2009, Board Member Arthur Baggett, Jr., the hearing officer for this proceeding, stated that, as expressed in the Notice of Public Hearing, the purpose of this proceeding is to determine if there has been a change in circumstances since the Kern River was included in the Declaration sufficient to justify the State Water Board revising the Declaration for the purpose of processing water right applications for the Kern River. Therefore, the parties were requested to limit evidence and testimony to whether additional information, based on court decisions or Board

---

<sup>1</sup> At the pre-hearing conference, these five parties, collectively called the North Kern Petitioners, agreed to consolidate testimony and file most exhibits jointly. The North Kern Petitioners likewise agreed to conduct direct and cross-examination of witnesses jointly. Each participant was allowed to give a separate opening statement and closing statement.

orders, or hydrological data showing periods of flows exceeding recognized rights, has become available since the Board listed the Kern River as fully appropriated.

A question was also asked regarding whether the State Water Board would accept evidence pertaining to contractual disputes over water in the Kern River. Board Member Baggett's September 25, 2009 letter to the service list stated that to the extent that these disputes are relevant to whether additional information has become available to justify the Board revising the Declaration, then such evidence may be considered.

The final issue raised at the pre-hearing conference was the extent to which instream flows and public trust matters would be addressed in this hearing. In his September 25, 2009 letter, the Hearing Officer stated public trust issues did not appear to be relevant to this proceeding. This issue is addressed more fully in Section 5.0 of this order.

The Board held a public evidentiary hearing on October 26-27, 2009. The hearing provided an opportunity for the petitioners and all interested parties to present evidence and argument in support of their positions. Following the hearing, the Board received legal briefs from the City of Bakersfield; the North Kern Petitioners, jointly; and the Kern County Water Agency, separately.

### **3.0 DESCRIPTION OF PENDING PETITIONS AND APPLICATIONS**

Each petitioner submitted an application to appropriate the water identified in the petitions as follows:

- 1) Buena Vista Water Storage District's petition and application request a right to collect a maximum of 520,000 acre-feet/annum (afa) in surface and underground storage, and to directly divert a maximum amount of 180,000 afa for the purpose of irrigation.
- 2) City of Bakersfield's petition and application propose combined direct diversion and surface and underground storage of 90,000 afa. The purpose of use is for irrigation, domestic, municipal, recreation, industrial, fish and wildlife enhancement, and water quality uses.

- 3) Kern County Water Agency's petition and application propose combined direct diversion and surface and underground storage of 2,279,000 afa. The purpose of use is for municipal, irrigation, and aquifer storage.
- 4) Kern Water Bank Authority's petition and application propose to directly divert at a rate of 10 cubic feet per second (cfs) for 5,000 afa for municipal use, 1,500 cfs for 490,000 afa for irrigation use, and 15 cfs for 5,000 afa for industrial use. The total combined amount taken by direct diversion and underground storage will be 500,000 afa.
- 5) North Kern Water Storage District and City of Shafter's petition and application request to directly divert at a rate of 1,850 cfs. The maximum combined amount of direct use and surface and underground storage is 500,000 afa. The application by North Kern Water Storage District and City of Shafter lists irrigation, groundwater replenishment, municipal, industrial, domestic and other uses, of the water.

#### **4.0 EVIDENCE SUPPORTING REVISION OF FULLY APPROPRIATED STREAM DECLARATION**

As described above, the purpose of the hearing was to receive evidence and testimony regarding whether additional information has become available since the Board listed the Kern River as fully appropriated to justify the State Water Board revising the Declaration for the purpose of processing water right applications for the Kern River. The information could be based on court decisions or Board orders, or hydrological data showing periods of flows exceeding recognized rights. To this end, both Bakersfield and the North Kern Petitioners presented evidence that in some years there are periods of flows exceeding recognized rights in the Kern River, even without regard to any additional water that may be available due to the Kern Delta's partial forfeiture of its pre-1914 water rights. (Bakersfield 2-1, p. 15 ¶¶ 69 & 70; Joint Exhibit (JE)-46, pp. 2-3, ¶ 4.)

Specifically, Bakersfield submitted exhibit 2-18, which is a table of water diversions via the Kern River/California Aqueduct Intertie (Intertie). This table shows Kern River water being diverted into the Intertie in nine separate years since 1978.

Likewise, the North Kern Petitioners presented a graph; exhibit JE 67, showing Kern River water "undistributed to existing entitlements" in several years. Daniel Easton, witness for the North



Kern Petitioners, explained in his written and oral testimony that there was what he calls “undistributed release” water in at least eight months since 1964. (JE-46, p. 12, ¶ 28; Reporter’s Transcript (R.T.) pp. 208-209.) Mr. Easton testified that water diverted into the Intertie is in excess of traditionally held and exercised rights and claims of right to Kern River water, and that whenever water has been released into the Intertie in the past, all Kern River water right claims had already been satisfied. (R.T. p. 264.) This water is, by definition, unappropriated water.

When asked about this “undistributed” water, Mr. Easton expressed his belief that the North Kern Decision would not have changed the availability of water in years of high flows; that water would have been available in those years anyway. (R.T. pp. 210-211.) Because the purpose of this hearing was to determine whether there is unappropriated water in the Kern River, not limited to whether the North Kern Decision made additional water available for appropriation, Mr. Easton’s point merely reinforces the fact that in some years there is unappropriated water. Mr. Easton’s point that water would have been available in those years regardless of the North Kern Decision further supports the conclusion that unappropriated water exists in the Kern River in some years.

In addition to the undisputed evidence that water has historically been diverted into the Intertie, and that those diversions are in excess of any proprietary water rights to the diversion and use of Kern River water, the evidence presented by the parties did not clearly resolve whether the partial forfeiture of Kern Delta’s rights itself created any additional unappropriated water. Because, however, there is sufficient evidence, as discussed above, to justify the State Water Board revising the Declaration for the purpose of processing water right applications for the Kern River, the Board will not make a determination at this time regarding whether the other pre-1914 rights claimants will use, in full, any water released to the Kern River by the forfeiture judgment. It will be up to the applicants to show when and how much available water there is for appropriation in the context of the Division’s processing of those applications.

## **5.0 ENVIRONMENTAL ISSUES/PUBLIC TRUST**

Several parties raised the issue of the extent to which instream flows and public trust matters would be addressed in this hearing. In his September 25, 2009 letter to the service list, the Hearing Officer stated that based on the key issues identified in the August 24, 2009 Notice of Public Hearing, public trust issues did not appear to be relevant to this proceeding. As specified in the Notice of Public Hearing, no determination regarding approval of the pending applications for appropriation of water will be made until after the State Water Board makes a determination on whether the stream system is fully appropriated.

The environmental issues associated with the North Kern Petitioners' and City of Bakersfield's water right applications will be addressed by the State Water Board in the context of processing Petitioners' applications. Prior to any potential approval or decision to proceed with a proposed project, these entities and the State Water Board must fulfill their obligations under the California Environmental Quality Act (CEQA). (Pub. Res. Code, § 21000 et seq.) In addition to meeting statutory responsibilities under CEQA, the State Water Board will comply with its obligation to consider environmental and public interest issues under the Water Code and the public trust doctrine in the context of processing the water right applications submitted by Petitioners. As such, those issues are not relevant to this order.

## **6.0 CONCLUSION**

It is clear from the evidence and testimony submitted by the parties to this hearing that, even without regard to the North Kern Decision, there is some unappropriated water in the Kern River. The State Water Board recognizes that processing water right applications will require consideration of numerous issues not addressed in this order, including those discussed above, the specific amounts of water available for appropriation under the applications, the season of water availability, the public interest in approval or denial of the applications, and any conditions to be included in any permits that may be issued on the applications. As indicated in the hearing notice, the focus of the Board's inquiry in this proceeding was on the relatively narrow task of determining if the evidentiary record supports revising the fully appropriated status of the Kern River. Based on our review of the record and the findings above, we conclude that the Declaration of Fully Appropriated Streams, as adopted by State Water Board Orders WR 89-25, WR 91-07 and WR 98-08, should be revised to allow for processing the applications to

appropriate water from the Kern River in accordance with the provisions of the Water Code and other applicable law.

## ORDER

**IT IS HEREBY ORDERED THAT**, based upon the foregoing findings:

- 1) The Declaration of Fully Appropriated Streams, as adopted by the State Water Board in Orders WR 89-25, WR 91-07 and WR 98-08, is amended to allow for processing applications to appropriate water from the Kern River.<sup>2</sup>
- 2) The Division shall process any water right applications accepted as a result of this order in accordance with applicable law.

## CERTIFICATION


The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 16, 2010.

AYE: Chairman Charles R. Hoppin  
Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc  
Board Member Walter G. Pettit

NAY: None

ABSENT: None

ABSTAIN: None

  
\_\_\_\_\_  
Jeanine Townsend  
Clerk to the Board

---

<sup>2</sup> This order does not affect the separate designations of the North Fork Kern River or the unnamed spring tributary to Cuddy Creek as fully appropriated.

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

ORDER WR 2010-0016

---

In the Matter of Petition for Reconsideration of

**North Kern Water Storage District  
City of Shafter  
Buena Vista Water Storage District  
Kern Water Bank Authority  
Kern County Water Agency**

Regarding Order Amending Declaration of Fully Appropriate Streams  
To Remove Designation of the Kern River as Fully Appropriated

---

**ORDER DENYING RECONSIDERATION**

BY THE BOARD:

**1.0 INTRODUCTION**

On February 16, 2010, the State Water Resources Control Board (State Water Board or Board) issued State Water Board Order (Order) [WR 2010-0010](#) amending the Declaration of Fully Appropriated Streams (FAS declaration) to remove the designation of the Kern River as fully appropriated. The FAS declaration was amended based on evidence showing unappropriated water in the Kern River. North Kern Water Storage District, City of Shafter, Buena Vista Water Storage District, Kern Water Bank Authority and Kern County Water Agency (Petitioners) jointly filed a petition for reconsideration on March 18, 2010 (Petition). Petitioners request that the State Water Board amend Order WR 2010-0010 to find that the petitioners requesting revision of the FAS declaration failed to demonstrate the existence of unappropriated water available for appropriation, and for that reason dismiss all petitions to revise the declaration. Petitioners also request that the Board amend Order WR 2010-0010 to “clearly state that occasional flood flows are not the basis for amending the FAS declaration absent an application” to place such waters to beneficial use, and for that reason dismiss all petitions to revise the declaration. In the alternative, Petitioners ask that the Board reopen the proceeding to receive further evidence regarding whether the Fifth District Court of Appeal’s (Court of Appeal) decision in *North Kern*



*Water Storage District v. Kern Delta Water District (North Kern)* (1997) 147 Cal.App.4th 555 resulted in additional water available for appropriation and definitively resolve that issue before accepting any water right applications on the Kern River.

## **2.0 GROUNDS FOR RECONSIDERATION**

Any person interested in any application, permit or license affected by a State Water Board decision or order may petition for reconsideration of the decision or order. (Cal. Code Regs., tit. 23, § 768.)<sup>1</sup> The legal bases for reconsideration are: (a) irregularity in the proceedings, or any ruling, or abuse of discretion, by which the person was prevented from having a fair hearing; (b) the decision or order is not supported by substantial evidence; (c) there is relevant evidence which, in the exercise of reasonable diligence, could not have been produced; or (d) error in law.

The State Water Board may refuse to reconsider a decision or order if the petition for reconsideration fails to raise substantial issues related to the causes for reconsideration set forth in section 768 of the State Water Board's regulations. (§ 770, subd. (a)(1).) Alternatively, after review of the record, the State Water Board may deny the petition if the State Water Board finds that the decision or order in question was appropriate and proper, set aside or modify the decision or order, or take other appropriate action. (*Id.*, subd. (a)(2)(A)-(C).)

## **3.0 LEGAL AND FACTUAL BACKGROUND**

The Kern River system was previously found to be fully appropriated throughout the year from the Buena Vista Sink upstream, including all tributaries where hydraulic continuity exists in Kern County, and, pursuant to Water Code section 1205, was included in the original FAS declaration. ([Order WR 89-25](#).) That original FAS declaration cited State Water Rights Board [D1196](#) (D1196), issued on October 29, 1964, as the basis for including the Kern River in the declaration. (Order WR 89-25, pp. 13-14.)

---

<sup>1</sup> All further regulatory references are to the State Water Board's regulations located in title 23 of the California Code of Regulations unless otherwise indicated.

In 2007, five petitions were filed with the State Water Board's Division of Water Rights (Division), requesting revision of the Kern River's fully appropriated status as listed in the FAS Declaration. The five petitions were received from the North Kern Water Storage District (North Kern) and City of Shafter, City of Bakersfield, Buena Vista Water Storage District, Kern Water Bank Authority and Kern County Water Agency. The petitions cited *North Kern* as the basis for filing the petitions. The Court of Appeal's ruling in *North Kern* found that there was a partial forfeiture of Kern Delta Water District's pre-1914 water rights on the Kern River, leaving it to the State Water Board to determine whether the Kern River is no longer fully appropriated. (*North Kern, supra*, 147 Cal.App.4th p. 583.)

Pursuant to section 871, subdivision (b), Victoria Whitney, the State Water Board Deputy Director for Water Rights, issued a memorandum dated October 8, 2008 (Whitney Memo), concluding that there is sufficient information to process the petitions and conduct a hearing on the question of whether the FAS declaration should be revised. The Whitney Memo identified two changes in circumstances since D1196 was issued in 1964 that provide bases for concluding that water may be available for appropriation. First, water has been diverted from the Kern River into the California Aqueduct on numerous occasions since the aqueduct's construction in 1977. (Whitney Memo, pp. 3-4.) Second, *North Kern* found that some of the rights that were considered in D1196 had been partially forfeited. (*Id.*, at pp. 3-5.)

On August 24, 2009, the Board issued a Notice of Public Hearing and Pre-Hearing Conference (Hearing Notice), stating that any action on the petitions would be for purposes of determining whether the Declaration should be revised, and no determination regarding approval of the pending applications will be made until after the Board makes a determination on whether the stream system is fully appropriated. (Hearing Notice, p. 2.) Pursuant to the Hearing Notice, the State Water Board held a pre-hearing conference on September 24, 2009 and a public hearing on October 26 and 27, 2009. After receiving all evidence, the Board accepted closing arguments, and on February 16, 2010, issued Order WR 2010-0010 amending the FAS Declaration to remove the designation of the Kern River as fully appropriated. Order WR 2010-0010 concluded that there is unappropriated water on the Kern River, because water in excess of any proprietary water right to diversion from the Kern River has been diverted into the Kern River-California Aqueduct Intertie (Intertie). (*Id.*, pp. 4-5.) Having determined that there is some unappropriated water on the Kern River without regard to the forfeiture,

Order WR 2010-0010 concluded that it was unnecessary to determine how much, if any, additional water was made available through forfeiture. (*Id.*, pp. 5-6.)

#### **4.0 DISCUSSION**

Petitioners offer six reasons why they believe Order WR 2010-0010 is inappropriate and improper. In summary, these arguments claim that it has not been established that any additional water has been made available for appropriation as a result of forfeiture, and that it was inappropriate to consider other changes in circumstances indicating that water is available for appropriation.

##### **4.1 It is not necessary for the evidentiary record to prove that the *North Kern* decision created “new water.”**

In Order WR 2010-0010, the Board concluded that even without regard to the *North Kern* decision, the evidentiary record established that there is some unappropriated water in the Kern River. Petitioners contend that “a petition [must] be dismissed unless the petitioner proves the existence of ‘new water’.” (Petition, p. 4.) Petitioners equate “new water” with a demonstration that the *Kern River* decision made additional water supplies available in excess of that needed to satisfy existing rights. (See *id.*, pp. 7-8.)

The Water Code does not set any specific limitation on the factors that may be considered in determining whether to revise the FAS declaration. (Wat. Code, § 1205, subd. (c).) State Water Board regulations indicate that the FAS declaration may be revised based on “any relevant factor, including but not limited to a change in circumstances ....” (§ 871, subd. (b).) The diversion of water into the California Aqueduct through the Intertie in amounts in excess of those needed to meet the demands of proprietary water right holders on the Kern River is a relevant factor because it constitutes a change in circumstance and demonstrates that there is unappropriated water on the Kern River.

In support of their argument that the existence of “new water” must be established, Petitioners rely on [Order WR 2000-12](#).<sup>2</sup> However, Order WR 2000-12 does not specify such a requirement. As Petitioners recognize, Order WR 2000-12 determined that there was a basis for revising the FAS declaration because “water previously lost as flood flows can now be stored or regulated by the new Seven Oaks Dam flood control project.” (Order WR 2000-12 at p. 1, see *id.* at pp. 13-14.) One of the circumstances justifying a revision of the FAS declaration here – the construction of a major water development project making it possible to capture what were previously considered to be flood flows that could not practicably be appropriated – is essentially the same as identified as a basis for modifying the FAS declaration in Order WR 2000-12.<sup>3</sup>

#### **4.2 The Board was not required to determine whether the North Kern decision resulted in unappropriated water.**

Petitioners contend that the Board improperly deferred a decision whether the *North Kern* decision resulted in appropriated water. Because the evidence in the record established that there is some unappropriated water in the Kern River even without regard to the forfeiture issue, it was unnecessary to determine whether the *North Kern* decision resulted in unappropriated water. It is not necessary to determine how much unappropriated water is available, and therefore is not necessary, at this stage, to determine whether there are additional reasons unappropriated water may be available beyond that identified as a basis for deciding that at least some unappropriated water is available. Once it is determined that there is adequate cause to revise the FAS declaration, the determination whether sufficient unappropriated water is available for the diversion and use proposed under an application can best be decided in proceedings to issue or deny a permit on that application. As stated in Order WR 2010-0010:

[P]rocessing water right applications will require consideration of numerous issues not addressed in this order, including ... the specific amounts of water available for appropriation under the applications, the season of water

---

<sup>2</sup> Petitioners also rely on an unpublished draft Board order concerning the American River. Because a draft order has not been adopted by the Board, it does not constitute “longstanding FAS precedent,” and Petitioners’ reliance on it is misplaced.

<sup>3</sup> Petitioners characterize the water made available by the Seven Oaks flood control project as “new water.” (Petition, p. 6.) Applying Petitioners’ definition of “new water,” water made available through flood control facilities that divert water through the Intertie would also constitute “new water.” Because the Water Code, Board regulations and Board precedents do not establish any requirement for “new water,” we see no need to define the term.



availability, the public interest in approval or denial of the applications, and any conditions to be included in any permits that may be issued on the applications.

(Order WR 2010-0010, p. 6.)

The Board has been consistently clear that these issues would not be decided during this particular portion of the proceeding, and that “[a]s indicated in the hearing notice, the focus of the Board’s inquiry in this proceeding was on the relatively narrow task of determining if the evidentiary record supports revising the fully appropriated status of the Kern River.” (*Ibid.*)

This approach is consistent with the Board’s approach in previous Board orders. As part of an order revising the FAS declaration as applied to the Santa Ana River, the Board stated:

All questions regarding the specific amount of water available for appropriation under the applications, the season of water availability, approval or denial of the applications, and the conditions to be included in any permit(s) that may be issued... will be resolved in further proceedings on each application pursuant to applicable provisions of the Water Code.

(Order WR 2000-12, p. 2.)

In Order WR 94-1, the Board denied a request for modification of the declaration for the Kern River because there had been no “showing that hydrologic conditions in the Kern River have changed or that other circumstances exist which justify the continued processing of Application 27554.” ([Order WR 94-1](#), p. 9.) The Board did not suggest that the petitioner was required to show exactly how much water had been made available in order for the Board to revise the declaration. The Board merely required a sufficient showing of the availability of at least some unappropriated water as to justify the processing of an application.

Contrary to Petitioners’ contentions, this approach is not in conflict with the *North Kern* decision. The Court of Appeal held that “the initial determination whether the forfeiture creates an allocable excess is reserved in the first instance to [the State Water Board].” (*North Kern, supra*, 147 Cal.App.4th p. 584.) The *North Kern* decision did not dictate that the Board would make its determination as part of its processing of a petition for revising the FAS declaration. If the FAS declaration is revised based on a determination that at least some water is available for appropriation, the Board may determine how much, if any, water is made available as a result of forfeiture as part of its subsequent review of an application to appropriate the water alleged to

have been forfeited. The approach followed by the Board in Order WR 2010-0010, where the Board determines to what extent unappropriated water is available as a result of the forfeiture in the context of a request by a party seeking to appropriate that water, is fully consistent with the *North Kern* decision. (See *id.*, p. 583 [the “determination will be made” by the State Water Board in reviewing “a petition of a potential appropriator of the excess.”].)<sup>4</sup>

#### **4.3 The evidence in the record supports the conclusion that water diverted into the Intertie is unappropriated water.**

The Whitney Memo directly raises the issue of water diverted into the Intertie, stating that “the agreement [between the Department of Water Resources (DWR), the Kern County Water Agency and other water districts asserting water rights on the Kern River] limits Intertie diversions to flood flows *in excess of the needs of the districts claiming water rights on the Kern River.*” (Whitney Memo, p. 3, italics in original.) Evidence presented at the hearing, as described in Order WR 2010-0010, directly supports this conclusion. Petitioners contend that the evidence supporting this conclusion cannot be relied upon.

Petitioners concede that substantial amounts of water have been diverted into the California Aqueduct, with diversions occurring on several occasions. (See Order WR 2010-0010, pp. 4-5.) They claim, however, that the testimony that these diversions were in excess of the needs of water right holders should be disregarded because the witnesses did not have the expertise necessary to conduct a legal analysis for the water rights of parties claiming rights on the Kern River. (Petition, pp. 13-14.) Petitioners’ argument mischaracterizes the nature of the testimony, which was based on the demands of those claiming entitlements, not the amounts to which the claimants might be entitled if they both intended to divert and reasonably needed the water for beneficial use. All water rights are limited to amounts reasonably necessary for beneficial use (Wat. Code, §§ 100, 101), and even if water could be put to beneficial use, it is unappropriated water if no water right holder intends to use it. (See *id.*, § 1201.) The witnesses were familiar

---

<sup>4</sup> We do not read the Court of Appeal's use of the word “petition” as intended to exclude the State Water Board's consideration of the issue as part of its processing of a water right application. There is no indication that the court had any intent to limit the discretion vested in the Board, including the discretion to decide which procedures the Board should employ in making its determination.

with hydrologic conditions and water demands on the Kern River, and were competent to testify on those issues. (See Joint Exhibit (JE) 46 and Bakersfield Exhibit 2-1.) Their testimony was more than adequate to support the conclusion that the waters diverted into the Intertie are taken from flows in excess of the amounts reasonably necessary to meet the demands of those with entitlements to divert water for beneficial use from the Kern River.

Based on previous determinations that the Kern River is fully appropriated, Petitioners also contend that the record indicates that diversions through the Intertie were not in excess of proprietary rights. (Petition, pp. 15-17.) But these determinations were based on conditions as they were understood to be prior to construction of the Intertie. (See, e.g., D1196; see also Order WR 89-25 [basing determination on the record before the Board when it issued D1196].) Moreover, these determinations and testimony cited by Petitioners are addressed to the general issue of whether unappropriated water is available under most conditions, and does not specifically address the relatively infrequently occurring conditions prevailing at times when water is diverted through the Intertie. Far from establishing that there is never any unappropriated water on the Kern River, Petitioners' reliance on previous determinations underscores the point that the evidence concerning diversions through the Intertie amounts to changed conditions.

Petitioners contend that there is "no evidence" that the water diverted through the Intertie has been "anything other" than water voluntarily transferred pursuant to pre-1914 appropriative rights. (See Petition, p. 18, citing Wat. Code, § 1706.)<sup>5</sup> But a voluntary transfer would be made pursuant to the entitlements and demands of Kern River users, contrary to the testimony that diversions through the Intertie are based on water in excess of those demands. (See JE 46 and Bakersfield Exhibit 2-1; see also Whitney Memo, p. 3 ["the agreement [between DWR, the Kern County Water Agency and other water districts asserting water rights on the Kern River] limits Intertie diversions to flood flows *in excess of the needs of the districts claiming water rights on*

---

<sup>5</sup> In the alternative, Petitioners contend that if the water diverted into the Aqueduct is being diverted solely for flood control purposes, and not for beneficial use, then the diversions are not subject to the Board's water right authority. (Petition, p. 18-19; see generally State Water Board Decision 100, p. 61 [flood control is not a beneficial use].) The purpose of these proceedings is not to determine whether water diverted through the Intertie is subsequently put to beneficial use for which a water right permit is required, but merely to determine whether the FAS declaration should be revised. Evidence that water is being diverted through the Intertie and exported from the Kern River watershed during periods when the diversion does not injure any water right holder on the Kern River, where there is no permit authorizing appropriation of water diverted through the Intertie, establishes the availability of unappropriated water whether or not a permit is required for those diversions.

*the Kern River.*”].) The testimony also indicated that diversions were made for flood control purposes. (Reporter’s Transcript, pp. 263-265.) There is no evidence in the record that any, let alone all, of the water diverted through the Intertie was delivered pursuant to a voluntary transfer under pre-1914 water rights.

**4.4 In determining whether to revise the FAS declaration, the Board is not limited to consideration of sources of unappropriated water sought to be appropriated by a party petitioning for revision of the FAS declaration.**

Petitioners suggest that because there are no applications for water diverted into the Intertie, the Board cannot amend the FAS declaration based on the availability of that water. (Petition, pp. 19-21.) However, the procedures for revising the FAS declaration do not limit the Board’s consideration to water sought to be appropriated in an application filed by a petitioner, or even require that an application be filed. Board regulations establish that the Board may revise the declaration based either on the recommendation of the Deputy Director for Water Rights, as provided by section 871, subdivision (b), or based on a petition of a person seeking revision of the fully appropriated status of a stream system, as provided by section 871, subdivision (c). Subdivision (b) does not include any requirement for the filing of an application, and under subdivision (c), a petitioner “may,” but is not required to, file an application accompanying the petition. (§ 871, subd. (c)(2).) The proceedings leading to adoption of Order WR 2010-0010 were based both on the recommendations of the Deputy Director for Water Rights and the petitions that had been filed.

Petitioners claim that they did not have proper notice that the availability of water diverted into the Intertie was relevant to whether the FAS declaration should be revised. This contention is without merit. The Whitney Memo, which was sent to the parties under cover of letter dated October 30, 2008, directly raises the issue of water diverted into the Intertie and unambiguously specifies that construction and use of the Intertie constitute changed circumstances since 1964. (Whitney Memo, p. 4.) The hearing notice clearly identified this memo as part of its discussion of the bases for the proceedings, and included a link to the Whitney Memo. (Hearing Notice, p. 2.) The Hearing Notice recited the conclusion that “there is sufficient information to process the petitions *and conduct a hearing on the question of whether the Declaration should be revised pursuant to California Code of Regulations, title 23, section 871, subdivision (b).*” (*Ibid.*) Thus, the parties were on notice that the hearing would include consideration of the

recommendations of the Deputy Director for Water Rights, as provided by section 871, subdivision (b), including the Deputy Director's recommendation that the FAS declaration be revised due to changed circumstances involving diversions into the Intertie, and not based solely on the petitions, pursuant to section 871, subdivision (c).

#### **4.5 The potential for issuance of temporary permits does not preclude revision of the FAS declaration.**

Petitioners claim it was legal error to revise the FAS declaration based on evidence indicating unappropriated water is available intermittently, during periods of high flows. (Petition, pp. 21-23.) Petitioners point out that these flows could be appropriated based on temporary permits, even if a stream system is listed as fully appropriated in the FAS declaration. (See Wat. Code, §§ 1206, subd. (c), 1425 et seq.) The temporary permit procedure is not intended as a substitute for approval of appropriations pursuant to the ordinary permitting process. (See *id.*, § 1425, subds. (a) [authorizing temporary permits based on "urgent need"] & (c) [the Board ordinarily should not issue a temporary permit if the applicant has not exercised due diligence to obtain a permit pursuant to the ordinary permitting process].) The desirability of authorizing appropriations through the ordinary permitting process, instead of through repeated issuance of temporary permits, is underscored by the statement in the Whitney Memo that "DWR has informed the State Water Board that it intends to use the Intertie more frequently over the next several years." (Whitney Memo, p. 3.)

While Petitioners are correct that temporary permits could be issued to authorize appropriations of flood flows, it does not follow that a temporary permit is the best or only method for authorizing such appropriation, as the circumstances where a temporary permit may be issued include almost any other circumstance that might support amendment of the FAS declaration to remove a fully appropriated listing. A temporary permit may be issued if unappropriated water is available on a stream system listed as fully appropriated, and permitting the appropriation would further the state policy that waters should be put to beneficial use to the fullest extent to which they are capable. (Wat. Code, § 1425, subd. (c).) If the FAS declaration could not be amended under circumstances where a temporary permit could be issued, the FAS declaration could not be amended based on changed circumstances indicating that unappropriated water is available. The Water Code provides the Board with broad authority to revoke or revise a declaration that a stream system is fully appropriated, without any reference to whether unappropriated waters are

available only occasionally or could be appropriated pursuant to temporary permits. (*Id.*, § 1205, subd. (c).) Adopting Petitioners' argument would eliminate that discretion, leaving the Board with little or no ability to revise a declaration that a stream system is fully appropriated.

In Order WR 2000-12, the Board revised the declaration that the Santa Ana River is fully appropriated based on occasional flood flows. Petitioners do not contend that Order WR 2000-12 was incorrectly decided, but instead argue that the Board's authority to revise the FAS declaration based on intermittently or occasionally available flows is limited to cases where an application is filed to appropriate those flows. (Petition, pp. 22-23.) As discussed above, however, the Board's authority to revise the FAS declaration is not limited to those issues that must be decided in addressing an application accompanying a petition to revise the FAS declaration.

As in the case of Order WR 2000-12, revising the FAS declaration here is consistent with the constitutional policy of putting waters to beneficial use to the fullest extent to which they are capable. (Cal. Const., art. X, § 2.) Revising the FAS declaration allows for the filing of applications to obtain rights to put to beneficial use high flows initially diverted for flood control purposes pursuant to the statutory appropriative rights procedures, and these statutory procedures are in furtherance of the constitutional policy. (See Wat. Code, § 1050.)<sup>6</sup>

---

<sup>6</sup> Order WR 2010-0010 and this order do not specifically address the issue of whether a permit is required for current operations of the Intertie. It is unnecessary to address that issue in order to determine that the FAS declaration should be revised, and the Department of Water Resources has requested that we not make a determination on the issue at this time. The Board's decision not to address the issue should not be construed as a determination that no permit is required or that the Board has any misgivings about the opinions expressed by the Chief Counsel in a memo dated January 22, 2007. Allowing parties to obtain water rights for beneficial use of waters diverted through the Intertie helps promote the constitutional policy of putting water to full beneficial use, and the Legislative determination that this policy should be implemented through the statutory permitting and licensing system, whether or not a permit is required for diversions through the Intertie.

#### 4.6 Order WR 2010-0010 is not unlawfully broad or uncertain.

Petitioners observe that the Board has discretion to impose conditions and limitations when it revises the FAS declaration to remove the designation of a stream system as fully appropriated, but cite no authority requiring the Board to impose conditions and limitations. In this case, the Board has determined that at least some unappropriated water is available, but has not determined how much. While some water rights on the Kern River have been partially forfeited under the *North Kern* decision, and some water may be available for appropriation as a result, it has not been determined how much, if any, unappropriated water has become available, or under what conditions it may have become available due to forfeiture. In addition, while water has been diverted through the Intertie only occasionally, it appears that the Intertie will be used more frequently in the future. In these circumstances, it would be difficult, if not impossible, to craft conditions or limitations that would meaningfully limit the types of applications that could be filed without having the undesirable effect of precluding applications seeking to appropriate water that is in fact unappropriated.

In these circumstances, Order WR 2010-0010 reasonably concluded that issues concerning the specific amounts of water available for appropriation, the season of water availability, and other issues relevant to determining whether water rights permits may be issued are best determined as part of the processing of water right applications. (Order WR 2010-0010, p. 6.) As part of its evaluation of a water right application, the Board may require the applicant to prepare and submit a water availability analysis. (See Wat. Code, §§ 1260, subd. (k), 1275, subd. (a).) The Board may also require of those who protest the application based on claims that the appropriation would divert water to which they are entitled, that they provide information supporting their protests. (*Id.*, § 1335, subd. (c)(3).) These procedures allow the Board to address availability of unappropriated water as part of application processing in greater detail than in a FAS declaration proceeding. Application processing procedures also serve to address other relevant issues, including environmental and public trust issues. (Order WR 2010-0010, p. 6.)

While the Board has discretion to impose conditions and limitations on the applications it will consider, imposing conditions like those suggested by Petitioners is neither necessary nor desirable at this time. If, as part of its consideration of an application, the Board issues an order



or decision determining that no water is available for appropriation under particular seasons or conditions, including but not limited to a determination that no water is available for appropriation taking into account waters reasonably necessary for the protection of instream beneficial uses under those seasons or conditions, the Board may amend the FAS declaration at that time. (See Wat. Code, §§ 1205, subd. (b), 1243.)

**ORDER**

**IT IS HEREBY ORDERED THAT,** for the foregoing reasons, Petitioners' petition for reconsideration is denied.

**CERTIFICATION**


The undersigned Clerk of the Board does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 4, 2010.

AYE: Chairman Charles R. Hoppin  
Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc  
Board Member Walter G. Pettit

NAY: None

ABSENT: None

ABSTAIN: None

  
\_\_\_\_\_  
Jeanine Townsend  
Clerk to the Board



**ENDORSED**

FILED  
SUPERIOR COURT, METROPOLITAN DIVISION  
COUNTY OF KERN

JUL 2 1 2011

TERRY McNALLY, CLERK  
BY \_\_\_\_\_ DEPUTY

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

SUPERIOR COURT OF THE STATE OF CALIFORNIA  
KERN COUNTY, METROPOLITAN DIVISION

**NORTH KERN WATER STORAGE DISTRICT, a California Water Storage District, CITY OF SHAFTER, a municipal corporation, BUENA VISTA WATER STORAGE DISTRICT, a California Water Storage District, KERN WATER BANK AUTHORITY, a California Joint Exercise of Powers Authority, KERN COUNTY WATER AGENCY, a California Special Act District,**

Petitioners,

v.

**STATE WATER RESOURCES CONTROL BOARD,**

Respondent,

**CITY OF BAKERSFIELD, a charter city and municipal corporation,**

Real Party in Interest.

Case No. S-1500-CV 270613 NFT

~~PROPOSED~~ JUDGMENT DENYING  
PETITION FOR WRIT OF  
ADMINISTRATIVE MANDATE

Dept: 17  
Judge: Hon. Stephen D. Schuett  
Action Filed: June 2, 2010

The Petition for Writ of Administrative Mandate filed by Petitioners North Kern Water Storage District, City of Shafter, Buena Vista Water Storage District, Kern Water Bank Authority

1 and Kern County Water Agency (Petitioners) came on for hearing in Department 17 of this Court  
2 on March 23, 2011 at 1:30 p.m. Matthew G. Bullock, Deputy Attorney General, appeared on  
3 behalf of Respondent State Water Resources Control Board. Scott K. Kuney, Nicholas Jacobs,  
4 Daniel Raytis, Jason Ackerman, and Kevin O'Brien appeared on behalf of Petitioners. Colin L.  
5 Pearce appeared on behalf of Real Party in Interest City of Bakersfield (Bakersfield).

6 Having reviewed and considered all papers submitted by all parties and the administrative  
7 record, and having heard the argument of counsel, IT IS ORDERED THAT:

8  
9 1. For the reasons stated in the "Final Ruling on Petition of Writ of Mandate" dated June  
10 14, 2011 and attached hereto as Exhibit A and made a part hereof, the petition for  
11 writ of mandate is denied.

12 2. Judgment is entered in favor of Respondent and Bakersfield as prevailing parties in  
13 this proceeding and against Petitioners.

14 ~~3. Respondent and Bakersfield shall be awarded their costs.~~ *SAC*

15 ~~4. The Court shall retain jurisdiction to hear a motion for attorney fees.~~ *SAC*

16 *Respondent and Bakersfield are awarded costs, subject*  
17 *to the filing of a Memorandum of Costs.*

18  
19 Dated: JUL 21 2011

JUDGE OF THE SUPERIOR COURT

**STEPHEN D. SCHUETT**

THE HON. STEPHEN D. SCHUETT

20  
21  
22  
23  
24  
25  
26  
27  
28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

APPROVED AS TO FORM

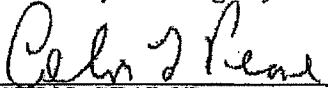
SCOTT K. KUNEY  
*Attorney for Petitioner*  
*North Kern Water Storage District*

JASON ACKERMAN  
*Attorneys for Petitioner*  
*City of Shafter*

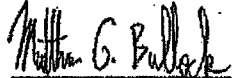
DANIEL RAYTIS  
*Attorneys for Petitioner*  
*Buena Vista Water Storage District*

KEVIN O'BRIEN  
*Attorneys for Petitioner,*  
*Kern Water Bank Authority*

NICHOLAS A. JACOBS  
*Attorney for Petitioner*  
*Kern County Water Agency*



COLIN L. PEARCE  
*Attorney for Real Party in Interest*  
*City of Bakersfield*



MATTHEW G. BULLOCK  
*Attorney for Respondent*  
*State Water Resources Control Board*

SA2010302141  
31260107.doc

# Exhibit A



**SUPERIOR COURT OF CALIFORNIA**  
**METROPOLITAN DIVISION**  
1415 TRUXTUN AVENUE, BAKERSFIELD, CA 93301

**DATE:** TUESDAY, JUNE 14, 2011

**COURT MET AT:** 11:00 AM      **DEPARTMENT** 17

**PRESENT:** HON: STEPHEN D SCHUETT, JUDGE

**CLERK:** LINDA KROLNIK/LK

**REPORTER:** NONE

**BAILIFF:** NONE

**TITLE:**

NORTH KERN WATER STORAGE DISTRICT A CALIFORN  
CITY OF SHAPTER A MUNICIPAL CORPORATION  
BUENA VISTA WATER STORAGE DISTRICT, A CALIFO, ET AL

**COUNSEL:**

ERNEST A CONANT  
" "  
" "

**VS.**

STATE WATER RESOURCES CONTROL BOARD, A CALIF  
CITY OF BAKERSFIELD, A CHARTER CITY AND MUNI

MATTHEW G BULLOCK  
COLIN L PEARCE

**CASE NUMBER:** S-1500-CV-270613, SDS

**NATURE OF PROCEEDINGS:** RULING. FINAL RULING ON PETITION OF WRIT OF MANDATE

SEE RULING ATTACHED AND MADE A PART HEREOF.

PETITION FOR WRIT OF MANDATE DENIED.

COPY OF MINUTE ORDER MAILED TO ALL PARTIES AS STATED ON THE ATTACHED DECLARATION

NATURE OF PROCEEDINGS: FINAL RULING ON PETITION FOR WRIT OF MANDATE

The Court, after consideration of the Petitioners' objections to the proposed decision and the responses to those objections filed by Respondent and Real Party in Interest, the court reaches the following decision:

Petitioners North Kern Water Storage District, City of Shafter, Buena Vista Water Storage District, Kern Water Bank Authority, and Kern County Water Agency (collectively "Petitioners") seek to set aside the decision of the State Water Resources Control Board (the "SWRCB")<sup>1</sup> set forth in WR Order 2010-0010 and WR Order 2010-0016 determining there is unappropriated water in the Kern River.

1. The Administrative Proceedings.

In 2007, the Fifth District Court of Appeals, in *North Kern Water Storage District v. Kern Delta Water District* (2007) 147 Cal.App.4<sup>th</sup> 555, held that Kern Delta Water District had forfeited certain senior water rights in the Kern River. However, the court declined to allocate those rights among the parties, deferring that process to the SWRCB: "That is a determination not for the courts in the first instance, but for SWRCB. If those resulting limitations on appropriation might result in a determination that the Kern River is no longer fully appropriated, that determination will be made by SWRCB on the petition of a potential appropriator of the excess." *Id.* at p. 583.

Subsequent to the *North Kern* decision, Petitioners, along with Real Party in Interest City of Bakersfield (the "City"), filed petitions with the SWRCB requesting that it consider revising the prior declaration of fully appropriated status (the "FAS Declaration") with respect to the Kern River. These petitions were filed pursuant to Water Code section 1205 and section 871 of Title 23 of the California Code of Regulations. Petitioners and Bakersfield also filed separate applications to appropriate water, should the SWRCB determine there was, in fact, unappropriated water in the Kern River.

In a memorandum dated October 2, 2008, the SWRCB concluded there was sufficient information to process the petitions and conduct a hearing on the question of whether the SWRCB should revise the FAS Declaration with respect to the Kern River. The SWRCB then conducted an evidentiary hearing on October 26 and 27, 2009. Petitioners and the City each presented evidence and testimony at the hearing.

On February 16, 2010, the SWRCB issued WR Order 2010-0010 amending the FAS Declaration to remove the designation of the Kern River as fully appropriated. The SWRCB concluded that there was water in excess of recognized rights, even without regard to any additional water that may be available due to Kern Delta Water District's partial forfeiture of its existing rights. The SWRCB based this decision on the finding

<sup>1</sup> In 1967, the State Water Quality Control Board and the State Water Rights Board were merged to form the State Water Resources Control Board. For simplicity, the Court refers collectively to the State Water Resources Control Board and its predecessor boards simply as the "SWRCB."

that there has been water diverted into the Kern River-California Aqueduct Intertie ("the Intertie"), a flood control project, in nine separate years since 1978. The SWRCB also found that because there was sufficient evidence to justify revision of the FAS Declaration on the basis of the diversion of water into the Intertie, it would "not make a determination at this time regarding whether the other pre-1914 rights claimants will use, in full, any water released to the Kern River by the forfeiture judgment." (KR002410)

On March 18, 2009, Petitioners filed a joint petition for reconsideration with the SWRCB. On May 4, 2010, the SWRCB issued Order WR 2010-0016 denying the application for reconsideration.

Petitioners now seek to set aside the decision of the SWRCB contained in WR 2010-0010 and WR 2010-0016 and have filed their petition for writ of mandate pursuant to Code of Civil Procedure section 1094.5. Petitioners allege four causes of action. First, that the SWRCB acted in excess of its jurisdiction in that the water diverted to the California Aqueduct through the Intertie is not within the jurisdiction of the SWRCB as authorized by Division 2 of the Water Code relating to the processing of applications for water rights. Second, the SWRCB acted in excess of its jurisdiction by failing to follow the procedures set forth in Water Code section 1205 and section 871, Title 23 of the California Code of Regulations in conducting the proceedings that led to the decision challenged by Petitioners. Third, the SWRCB's decision constitutes prejudicial abuse of discretion by adopting findings that are not supported by the evidence. Fourth, the SWRCB failed to proceed in the manner required by law by failing to follow the *North Kern* decision.

For the reasons stated below, the Court denies the Petition for Writ of Mandate.

## 2. Petitioners' Standing

Real party in interest City challenges the standing of the Petitioners to bring this action because Petitioners are not aggrieved in any way by the decision below of the SWRCB. City argues that the SWRCB has not made any order or taken any action which impacts the rights of Petitioners, any other rights on the Kern River or the practical operation of the Kern River. Moreover, argues the City, the Petitioners obtained exactly what they asked for by filing their petitions with the SWRCB, a declaration that the Kern River is not fully appropriated. "Generally speaking a party not aggrieved is a party not beneficially interested." *Grant v. Board of Med. Examiners* (1965) 232 Cal.App.2d 820, 827.

In *Bodinson Mfg. Co. v. California Employment Commission* (1941) 17 Cal.2d 321, the court considered whether an employer was a beneficially interested party under Code of Civil Procedure section 1086. In concluding it was, the court stated:

We are aware of no authority which holds that a person permitted by statute to participate as an interested party in the administrative hearings and to take appeals at the administrative level is, nevertheless, without a

sufficient interest in the result to test the legality of the final decision before a court of law. Indeed, it seems to us that elemental principles of justice require that parties to the administrative proceeding be permitted to retain their status as such throughout the final judicial review by a court of law, for the fundamental issues in litigation remain essentially the same. (Cf. *L. Singer & Sons v. Union Pac. R. Co.*, \_\_\_ U. S. \_\_\_ [61 Sup. Ct. [Adv.] 254, \_\_\_ L. Ed. \_\_\_], Frankfurter, J., concurring at p. 259.) Furthermore, it seems apparent that the employer whose reserve account is affected is the only person having sufficient incentive to challenge a decision awarding benefits. Action by this employer provides the only procedural guarantee that the commission can be held by legal process to comply with the requirements of the statute under which it operates.

Water Code section 1205 allows "any interested person" to petition the SWRCB seeking a revocation or revision of a declaration that a stream system is fully appropriated. Petitioners filed their petitions as permitted by the Water Code as interested parties. Petitioners continue to retain their "interested person" status in this writ proceeding to test before a court of law the legality of the SWRCB's final decision. *Temescal Water Co. v. Department of Public Works* (1955) 44 Cal.2d 90, 107. Therefore, Petitioners have standing under Code of Civil Procedure section 1086.

### 3. Standard of Review

Subsection (b) of Code of Civil Procedure §1094.5 states that "[t]he inquiry in such a case shall extend to the questions whether the respondent has proceeded without, or in excess of jurisdiction; whether there was a fair trial; and whether there was any prejudicial abuse of discretion. Abuse of discretion is established if the respondent has not proceeded in the manner required by law, the order or decision is not supported by the findings, or the findings are not supported by the evidence." Where, as here, the issue is whether a fair administrative hearing was conducted, the petitioner is entitled to an independent judicial determination of the issue: *City of Fairfield v. Superior Court* (1975) 14 Cal.3d 768, 776. This independent review is not a "trial de novo." *Hadley v. City of Ontario* (1974) 43 Cal.App.3d 121, 127. Instead, the court renders its independent judgment on the basis of the administrative record. Accordingly, the parties have stipulated that the standard of review in this matter, at least with respect to the First, Second and Fourth causes of action, should be "de novo." The Court has therefore considered those causes of action using that standard of review.

Real parties in interest City and SWRCB believe the Third Cause of Action should also be reviewed under the substantial evidence standard. Petitioners argue that the Third Cause of Action should be reviewed under the "independent judgment" test. For the reasons stated below, the Court determines that the Third Cause of Action is subject to review under the substantial evidence standard.

Under Code of Civil Procedure section 1094.5(c), "[i]n cases in which the court is authorized by law to exercise its independent judgment on the evidence, abuse of



discretion is established if the court determines that the findings are not supported by the weight of the evidence." By law, the trial court must exercise its independent judgment when the administrative decision substantially affects a vested right of the petitioner. *Bixby v. Pierno* (1971) 4 Cal.3d 130.

Petitioners argue their vested rights are affected by the decision of the SWRCB in this case because "the Order infringes upon existing Kern River water rights entitlements which are fundamental and vested." (Petitioners' Opening Brief, at 20:8-10.) However, the effect of a revocation of a fully appropriated stream declaration is to allow processing of water rights applications, not to approve an application or to make the findings required as a prerequisite to the issuance of a water right, i.e. that there is definitely unappropriated water available to supply the applicant. Water Code §1375(d). The effect of revoking the declaration is only to give the applicants the opportunity to subsequently obtain an individualized determination on the availability of unappropriated water for their applications. Once the SWRCB revokes or revises a fully appropriated stream declaration, it will process applications for permits to appropriate water on that stream system consistent with the order revoking or revising the declaration, including review of a Water Availability Analysis. Water Code §§1243, 1260 and 1375.

Because the decision of the SWRCB at this stage in the proceedings cannot determine rights to the Kern River it cannot affect Petitioners' existing rights. To the extent the SWRCB has determined there is unappropriated water in the Kern River, any potential water rights that it would issue in subsequent proceeding would, pursuant to the Water Code, be junior to and subject to all prior existing vested rights. *Temescal Water Co. v. Department of Public Works*, supra, 44 Cal.2d 90, 106. *North Kern Water Storage District v. Kern Delta Water District*, supra, 147 Cal.App. 4<sup>th</sup> 555, 583-4. Water Code §§ 695, 731. Petitioners' vested rights, whatever they may be, are not impacted by this decision of the SWRCB. Therefore, substantial evidence is the proper standard of review for the Third Cause of Action.

In reviewing the record below, this Court is mindful of the role of the trial court in this matter as explained in *Johnson Rancho Water District v. State Water Rights Board* (1965) 235 Cal.App.2d 863, 867, that "[t]he legislature has entrusted the allocation of the state's uncommitted water resources to the Water Rights Board, not to the courts. Unless it can be demonstrated that the board's actions are not grounded upon any reasonable factual basis the courts should not interfere with its discretion or substitute their discretion for that of the board. [Citations.]"

Petitioners bear the burden of proof to demonstrate that the administrative record does not contain sufficient evidence to support the SWRCB's decision. *State Water Resources Control Cases*, (2006) 136 Cal.App.4<sup>th</sup> 744, 763-64. In reviewing the SWRCB's decision, the trial court "exercises an essentially appellate function in that only errors of law appearing on the administrative record are subject to its cognizance." *El Dorado Irrigation Dist. v. State Water Resources Control Bd.* (2006) 142 Cal.App.4<sup>th</sup> 937, 960. Moreover, the court should presume that the SWRCB considered the documents before it and all reasonable doubts should be resolved in favor of upholding the SWRCB's

decision. *County of Los Angeles v. State Water Resources Control Bd.* (2006) 143 Cal.App.4<sup>th</sup> 985, 997-98.

With these principals in mind, the Court has reviewed the record below and made the following determinations with respect to each of Petitioners' causes of action.

4. The SWRCB did not lack jurisdiction to determine whether to revoke the declaration of fully appropriated stream with respect to the Kern River.

Petitioners argue that errors by the SWRCB in initiating the proceedings below as well as errors with the hearing notice deprived the SWRCB of jurisdiction to act. Petitioners are incorrect.

a. The SWRCB initiated the administrative proceedings by determining the petitions showed reasonable cause to conduct a hearing.

Water Code section 1205 and section 871 of Title 23, California Code of Regulations, provide for two mechanisms by which the SWRCB may consider whether to revoke a declaration of fully appropriated stream. Subsection (c) of section 1205 provides: "Upon its own motion or upon petition of any interested person, and following notice and hearing, the board may revoke or revise a declaration that a stream system is fully appropriated." This process is further delineated in section 871, of Title 23:

(a) The board may, upon its own motion or upon petition of any interested person, revoke or revise a declaration, as hereinafter provided.

(b) Upon recommendation of the Chief, Division of Water Rights, and following notice and hearing, the board may adopt an order revoking the fully-appropriated status of a stream system which has previously been declared fully appropriated, or revising any condition specified in a declaration upon which applications to appropriate unappropriated water will be accepted for filing and registrations of small domestic use appropriations will be accepted. The Chief's recommendation for revocation or revision may be based upon any relevant factor, including but not limited to a change in circumstances from those considered in a previous water right decision determining that no water remains available for appropriation, or upon reasonable cause derived from hydrologic data, water usage data, or other relevant information acquired by the Division of Water Rights in the course of any investigation conducted by it.

(c) Any person may petition the board to revoke or revise the fully appropriated status of a stream system included in a declaration. The Chief, Division of Water Rights, shall give notice of receipt of any such petition to all persons known by the Chief to be interested in the fully-appropriated status of the stream system.

(1) The petition shall include hydrologic data, water usage data, or other relevant information based upon which the Chief, Division of Water Rights, may determine that reasonable cause exists to conduct a

hearing on the question whether the fully appropriated status of the stream system should be revoked or revised.

(2) The petition may also be accompanied, depending upon the magnitude of the proposed appropriation, either (A) by a proposed application to appropriate unappropriated water, or (B) by a proposed registration of small domestic use, notwithstanding that the proposed application or registration is unacceptable because it proposes appropriation from a stream system declared to be fully appropriated and does not meet existing conditions for acceptance. Any such proposed application or registration should be complete pursuant to the law and the rules of the board, including payment of the filing fee. The board may cancel the application for failure to pay any annual fee for the application when due.

(3) A proposed application or registration submitted pursuant to subsection (c)(2) will not be accepted but will be retained by the board. Should the board thereafter act in response to the petition to change the declaration in a manner which would make the proposed application or registration acceptable, the proposed application or registration will, if otherwise complete pursuant to the law and the rules of the board, be accepted. A proposed application or registration accepted pursuant to this subsection shall be assigned a priority superior to that assigned to any subsequently retained or accepted application or registration, respectively, proposing to appropriate from a source included in the earlier proposed application or registration; provided that, in proceeding upon competing applications accepted because of a change in the declaration pursuant to this section, the board will implement all provisions of law governing approval and rejection of applications including, but not limited to, Water Code section 1255 relating to public interest.

(4) If the Chief determines that the petition shows reasonable cause to conduct a hearing on the question whether the declaration should be changed, the Chief shall notice a hearing on the issue. The board may thereafter adopt an order changing the declaration or declining to do so.

(5) If the Chief determines that the petition does not show reasonable cause to conduct a hearing on the question whether the declaration should be changed, the Chief shall notify the petitioner, and all persons given notice pursuant to subsection (c) of this section, of such determination. The petitioner may, within 30 days of the date of the notice, file a request that the board review the Chief's determination. Following receipt of any such request timely filed, the board will review the Chief's determination. The board's review shall be limited to the information provided by petitioner to the Chief, pursuant to subsection (c)(1) of this section. Following its review, the board may affirm the Chief's determination, direct the Chief to reconsider the determination, or

direct the Chief to notice a hearing on the question whether the declaration should be changed.

The process provided for in section 871 contemplates that the SWRCB acts either by way of a petition filed by any person or by way of a recommendation by the Chief, Division of Water Rights.

The SWRCB argues that the Board acted under both subdivision (b), on the Board's own motion, and under subdivision (c), upon the petitions of the interested parties. Petitioners argue that the SWRCB failed to invoke either procedure properly and, therefore, lacked jurisdiction to proceed. The Court finds that both positions are incorrect, but does determine that the Board properly proceeded under the authority of subdivision (c), acting on the petitions of the parties.

Following the filing of the petitions, Katherine Mrowka, Chief, Watershed Unit 3, Division of Water Rights, in a memorandum dated October 2, 2008 to Victoria A. Whitney, Division Chief, states, "[t]herefore I conclude that there is sufficient information to process the petitions and conduct a hearing on the question of whether the Declaration should be revised pursuant to title 23, California Code of Regulations, section 871, subdivision (b)." (KR 001813.) On October 10, 2008, Deputy Director Whitney "concur[red]." (KR 001813.) This document has been referred to by the parties as the "Whitney Memo."

In its brief, SWRCB cites to KR 002508, which is a portion of Order WR 2010-0016 denying the application for reconsideration, as evidence of its compliance with subdivision (b). The decision relies on the Whitney Memo as the sole basis for concluding the SWRCB complied with subdivision (b). However, the record is absent of any evidence of the SWRCB's compliance with the basic requirements under subdivision (b), which are a "recommendation" by the Chief, Division of Water Rights and the Board acting "on its own motion."

SWRCB contends the Whitney Memo is "tantamount" to a recommendation by the Chief, Division of Water Rights. However, the statement in the Whitney Memo clearly reflects only the determination of reasonable cause to conduct a hearing on the petitions and there simply is no recommendation to the Board for the Board to proceed on its own motion. Moreover, there is nothing in the record to demonstrate that the Board did in fact proceed on its own motion. While the SWRCB now contends that there is no need for the Board to present itself with a formal written motion, section 871 clearly contemplates some affirmative action by the Board in order to proceed under subdivision (b) and this did not occur. Therefore, there has not been compliance by the SWRCB with subdivision (b).

However, the Court's determination that the SWRCB did not comply with subdivision (b) does not mean it lacked jurisdiction to proceed. Subdivision (c)(4) of section 871 provides that "[i]f the Chief determines that the petition shows reasonable cause to conduct a hearing on the question whether the declaration should be changed, the Chief

shall notice a hearing on the issue." The Whitney Memo documents the Chief's determination that there was reasonable cause to conduct the hearing and proceeded on that basis. Therefore, there has been compliance with subdivision (c) in initiating the hearing process.

b. The notice of hearing was not inadequate.

Subsection (a) of section 874 of title 23, California Code of Regulations governs the notice of hearing:

(a) The Chief, Division of Water Rights, shall give notice of any hearing scheduled pursuant to this article in accordance with Water Code Section 1207 and shall in addition mail notice at least 60 days prior to the date of the hearing to all persons interested in any pending application to appropriate unappropriated water from any stream which is the subject of the hearing.

Water Code section 1207 requires:

Notice of hearing pursuant to this article shall be given as follows:

(a) The notice shall be published at least once a week for four consecutive weeks in one or more newspapers of general circulation published in each county in which any part of the stream system is situated, and publication shall be complete at least 60 days prior to the date of hearing.

(b) At least 60 days prior to the date of the hearing, the notice shall be mailed to all persons known to the board who own land that appears to be riparian to the stream system, who divert water from the stream system, or who have made written request to the board for special notice of hearing pursuant to this article.

In the administrative proceedings below, the SWRCB prepared a four-page Notice of Hearing (KR 001842). That notice provided the background information leading up to the decision to conduct a hearing and included three key issues: 1) should the State Water Board revise the Declaration to allow the Division of Water Rights to accept and process water rights applications to appropriate water from the Kern River?; 2) has adequate information been provided to demonstrate that there is a change in circumstances since the Kern River was included in the Declaration?; and 3) have the petitioners provided sufficient hydrologic data, water usage data, or other relevant information to support a determination that there is unappropriated water in the Kern River system during the season applied for to justify revising the Declaration for the purpose of accepting and processing water right applications for the Kern River?. The hearing notice also included an enclosure entitled "Information Concerning Appearance at Water Right Hearing." (KR001845.) The hearing notice was mailed to interested parties (KR001853; KR001876) at least 60 days prior to the hearing. Therefore, the notice provided by the SWRCB met the statutory requirement.

(The Court notes that the proof of publication is not contained in the administrative record. However, as the Petitioners have not alleged any violation related to the publication of the Notice of Hearing, the Court does not need to address any issue related to publication of the notice.)

c. The SWRCB procedures were consistent with due process considerations.

Petitioners' real argument is not whether the SWRCB had jurisdiction to act, as it clearly did, but whether the scope of the proceedings as ultimately captured in the SWRCB decision was beyond the scope contemplated by the notice of hearing, as contained in the statement of key issues discussed above. Petitioners believe that they were not provided with fair notice that the proceedings could include consideration of water entering the Intertie and, moreover, that the SWRCB could only consider evidence within the scope of the issues raised by the petitions. (Petitioners' Reply Brief, 8:25 - 9:27.) This failure to provide advance notice and the SWRCB's consideration of evidence beyond the scope of the issues raised by the petitions, argue Petitioners, has resulted in a denial of a full and fair hearing on the merits.

From a strict due process analysis, this argument lacks legal merit. The Fourteenth Amendment to the United States Constitution prohibits states from depriving "any person of life, liberty, or property, without due process of law; ..." California Constitution article I, section 7, mirrors its federal counterpart: "(a) A person may not be deprived of life, liberty, or property without due process of law...." However, contrary to the Petitioners' general statements regarding the application of due process principles to the hearing notice in the instant case, the courts have consistently refused to extend due process protection to public entities, which all the Petitioners are.

"[S]ubordinate political entities, as 'creatures' of the state, may not challenge state action as violating the entities' rights under the due process or equal protection clauses of the Fourteenth Amendment or under the contract clause of the federal Constitution. 'A municipal corporation, created by a state for the better ordering of government, has no privileges or immunities under the federal constitution which it may invoke in opposition to the will of its creator. [Citations.]' [Citations.]" (*Star-Kist Foods, Inc. v. County of Los Angeles* (1986) 42 Cal.3d 1, 6. See also *Santa Monica Community College Dist. v. Public Employment Relations Bd.* (1980) 112 Cal.App.3d 684, 690, citing "the long line of cases which hold that a public entity, being a creature of the state, is not a 'person' within the meaning of the due process clause, and is not entitled to due process from the state." Consequently, Petitioners lack standing to assert the notice and hearing process followed by the SWRCB deprived them of any due process.

Even if Petitioners' argument is reframed to suggest that the SWRCB's jurisdiction was limited to taking testimony and evidence that was only within the scope of the petitions that argument is not supported by the record.

First, this argument suggests that the SWRCB should have turned a blind eye to any evidence, albeit relevant to the issue of whether the FAS Declaration should be revoked, unless it was specific to the forfeiture issue raised by the *North Kern* decision. However, the notice of hearing was sufficiently broad to allow the SWRCB to consider any evidence related to whether there is "sufficient hydrologic data, water usage data, or other relevant information to support a determination that there is unappropriated water in the Kern River system during the season applied for to justify revising the Declaration for the purpose of accepting and processing water right applications for the Kern River." (KR001845.)

Second, there is significant evidence in the record to indicate the parties were aware that the hearing could encompass issues outside the limits of the issues raised by the petitions. By letter dated September 17, 2009, Petitioners provided their views on the nature and scope of the upcoming hearing. The letter from Petitioners contains a footnote which reads: "The Petitioners understand that the State Board's omission of any reference to the Kern River Intertie Canal and California Aqueduct in the list of Key Issues set forth in the Notice indicates that the State Board no longer believes this issue is relevant to these proceedings (a position with which Petitioners agree)." (KR001880.)

By letter dated September 25, 2009, following the SWRCB pre-conference hearing to discuss procedural issues related to the upcoming hearing, the SWRCB hearing officer stated:

The primary concern of the parties was the scope of the evidence that will be considered in this proceeding. As expressed in the Notice of Public Hearing, the purpose of this proceeding is to determine whether there has been a change in circumstances since the Kern River was included in the Declaration, sufficient to justify the State Water Board revising the Declaration for the purpose of accepting and processing water right applications for the Kern River. To this end, and to avoid undue burden on the parties and the State Water Board Hearing Team, evidence and testimony should be limited to whether additional information, based on court decisions or Board orders, or hydrologic data showing periods of flows exceeding recognized rights, has become available since the Board listed the Kern River as fully appropriated to justify the Board revising the Declaration.

(Emphasis added; KR001960.)

The September 25, 2009 letter goes on to address an issue raised in the pre-hearing conference:

A question was also asked regarding whether the State Water Board will accept evidence pertaining to contractual disputes over water in the Kern River. To the extent that contractual disputes are relevant to whether, based on Board orders, court decisions, or hydrological data, additional

information has become available since the Board listed the Kern River as fully appropriated to justify the Board revising the Declaration, then such evidence may be considered. Testimony not related to adjudicated or otherwise recognized rights to divert and use water from the Kern River will be excluded as irrelevant.

(Emphasis added; KR001960.) That letter was served on all interested parties. (KR001961.)

It is clear from the statements in this letter from the SWRCB that any evidence related to whether there is additional information, based on Board orders, court decisions or hydrological data, that information would be relevant to the proceedings. While the parties were certainly focused on the potential impact of the *North Kern* decision on the FAS Declaration, the SWRCB had not limited itself to considering only testimony related to that single issue and had advised the parties that the scope of the hearing would be broader than that.

The September 25, 2009 SWRCB letter did specifically exclude from the hearing process "instream flows and public trust matters." (KR001960.) It is significant that the SWRCB did not exclude, as requested by Petitioners, the Intertie issue from those matters that were deemed to be not relevant to the hearing process. Given the breadth of the hearing notice and the subsequent correspondence from the SWRCB, it cannot be said that Petitioners were misled to their prejudice regarding the scope of the hearing.

Further, Petitioners received a full and fair hearing on the merits. Petitioners were allowed to present and rebut evidence, were represented by counsel and allowed to cross examine witnesses. Petitioners were also permitted to file post-hearing briefing. Petitioners' post-hearing brief addresses the possibility of the SWRCB modifying the FAS Declaration so that diversions to the Intertie would be subject to SWRCB water right permitting authority. (KR002095-96; 002109-13.) Nowhere do Petitioners object to the SWRCB accepting evidence related to the diversion to the Intertie but actually provide suggestions on how the SWRCB could address the issue.

Moreover, under the SWRCB rules, Petitioners were afforded an opportunity to object to evidence. With respect to the evidence relied upon by the SWRCB in reaching its decision, Petitioners first objected to the testimony of Florn Core, which discusses the Intertie operations, prior to the hearing by filing their Joint Motion and Memorandum of Points and Authorities in Support Thereof to Exclude Written Testimony of Gene W. Bogart and Florn R. Core, and Request for Order Limiting Oral Testimony. (KR 001984.) However, Petitioners did not raise any objections to the testimony based on it being irrelevant or outside the scope of the proceedings.

In reaching its decision, the SWRCB also relied on evidence produced by Petitioners at the hearing, including Joint Exhibit 46 (KR006984) and Joint Exhibit 67 (KR007021) and the testimony of Daniel Easton, Petitioners' expert witness, regarding the Intertie. (KR002781-83.) This testimony was in response to questions from SWRCB staff and



made without objection from the Petitioners. Petitioners cannot now claim that the SWRCB exceeded its jurisdiction or denied them a fair hearing by considering the evidence produced by Petitioners themselves or introduced by other parties without objection as to its relevance.

Therefore, the Court finds in favor of the Respondent and Real Party in Interest SWRCB on the Second Cause of Action.

5. The SWRCB did not fail to comply with the *North Kern* decision.

Petitioners argue that the SWRCB failed to comply with the direction of the Court of Appeal in the *North Kern* decision. Petitioners point to the following language that appears at 147 Cal.App.4<sup>th</sup> 555, 583:

If water rights are forfeited, however, the cumulative effect could be that the river is no longer oversubscribed. That is a determination not for the courts in the first instance, but for SWRCB. If those resulting limitations on appropriation might result in a determination that the Kern River is no longer fully appropriated, that determination will be made by SWRCB on the petition of a potential appropriator of the excess.

Petitioners rely on the court's use of the phrase, "that determination will be made" by the SWRCB to argue that the court was directing the SWRCB to make that determination. The Court finds this argument is without merit.

Clearly, this language is not part of the court's order nor was the SWRCB a party to the action. It is difficult to imagine how the SWRCB would be bound by language that is obiter dictum in a decision to which it is not a party. The court of appeal is simply indicating that it is within the jurisdiction of the SWRCB in the first instance to rule on any petition to revoke the FAS rather than a decision that can be made by the court. The use of the word "will" reflects only the temporal relationship of the SWRCB decision to the court's opinion, i.e. that it will occur in the future, as opposed to mandatory language directing the SWRCB to make a decision. As the SWRCB has correctly pointed out in its brief "if Petitioners wanted resolution of water availability on the river, the State Board was the proper venue." (Respondent's Opposition to Petition for Writ of Mandate, p. 19:16-17.)

Therefore, the Court finds for Respondent and Real Party in Interest SWRCB with respect to the Fourth Cause of Action.

6. The SWRCB did not act in excess of its jurisdiction by finding water entering the Intertie is unappropriated water.

Petitioners argue that the SWRCB exceeded its jurisdiction by finding the water entering the Intertie is unappropriated water. By way of background, the U.S. Army Corps of Engineers constructed the Intertie as a flood control project in 1977. The Intertie

operates to discharge high water flows of the Kern River into the California Aqueduct, and its flood control function is intended to protect downstream agricultural lands. The California Department of Water Resources operates the Intertie in accordance with an agreement among the Department of Water Resources, the Kern County Water Agency and other water districts asserting water rights on the Kern River. (KR001811, 002212, and 005583.)

Petitioners' Petition for Writ of Mandate claims that "[a]ll of the Kern River water discharged into the Intertie during flood control operations is governed exclusively by the separate and independent legal authorities adopted by the Legislature as stated in Divisions 5 and 6 of the Water Code relating to floods, flood water, and flood control projects and policies." (Petitioners' Verified Petition for Writ of Administrative Mandamus, 18:13-16.) While this may be true, it is not dispositive of the issue before this Court and that was addressed by the SWRCB. The issue to be decided by the SWRCB was whether, prior to it entering the Intertie facility, the water is appropriated or unappropriated water. It is not the end use that the SWRCB is regulating in the decision below, but making its determination regarding the status of the water in the river prior to it reaching the Intertie.

The California courts have held that "flood" or "excess" flows are under state jurisdiction and are available for appropriation and use as surplus water.<sup>2</sup> In *Allen v California Water & Tel. Co.* (1946) 29 Cal.466, 486, the court found that that high, surplus flows could be appropriated even if "subject to interruption or cessation." In *Chowchilla Farms v. Martin* (1933) 219 Cal. 1, 36, the Court stated that flood waters "are nevertheless a part of the regular flow of the stream and are not subject to appropriation as against riparian owners on the stream so long as they are or can be put to a beneficial use by said riparian owners." Therefore, the Court finds that the SWRCB did not exceed its jurisdiction by making the determination regarding water that ultimately flows into the Intertie.

Petitioners further argue that it appears that the SWRCB revised the Kern River FAS Declaration because "the Water Board erroneously believes that the Department cannot accept Kern River flood water into the California Aqueduct via the Intertie without a water right permit." (Petitioners' Opening Brief, 10:19-21.) Petitioners point to the statement in the Whitney Memo (KR 001811) as evidence that this served as part of the basis for the SWRCB's decision. However, the actual decision of the SWRCB as set out in WR Order 2010-0010 and 2010-0016 does not contain such a statement or finding. Accordingly, the attribution of this argument to the SWRCB is not supported by the record and mischaracterizes the basis of the SWRCB decision.

The draft order sent out by the SWRCB after the conclusion of the hearing did contain a line that read: "In addition to the undisputed evidence presented regarding unappropriated water that has historically been diverted into the Intertie without a valid basis of right, the evidence presented by the parties did not clearly resolve whether the partial forfeiture of

<sup>2</sup> "Flood waters are those which escape from a stream or other body of water and overflow the adjacent territory." *LeBrun v. Richards* (1930) 210 Cal. 308, 315. The extraordinary overflow of rivers and streams is known as "flood water." *Keys v. Romley* (1966) 64 Cal.2d 396, 400.

Kern Delta's rights itself created any additional unappropriated water." (Emphasis added; KR002137.) In response to the draft order, David Sandino, the Chief Counsel for the State of California Department of Water Resources, submitted a comment letter objecting to the emphasized language in the draft order. Mr. Sandino stated, in part, that the "purpose of the Intertie operation is not to divert water for beneficial use but to direct it out of the river for flood protection purposes. The statement on page 5 of the Draft Order that the Intertie diversions are 'without a valid basis of right' is both unnecessary and misleading and should be deleted." (KR002212.) The final order does not contain the language objected to by Mr. Sandino. Therefore, it is clear to the Court that the SWRCB did not base its decision on whether the Intertie operations required a water right permit.

Moreover, the proceedings before the SWRCB were simply to determine whether the FAS declaration should be revised and were not to determine whether any water permit was necessary for discharge into the Intertie. That issue – whether a permit is required for the Intertie – is beyond the scope of the SWRCB proceedings and is not an issue considered by this Court.

Petitioners next argue that because the Intertie is a federally authorized flood control facility, the Supremacy Clause of the U.S. Constitution prohibits the SWRCB from taking any action affecting the Intertie. As discussed above, the actions of the SWRCB in determining whether the Kern River FAS should be revised has no present impact on the allocation or use of any water in the Kern River. No determination has been made as to when or how much water is available or whether the SWRCB will grant any applications for use of unappropriated water. Consequently, it cannot be said that the SWRCB decision has any effect on the Intertie and, therefore, the SWRCB was not preempted from making the decision it did.

This conclusion is supported by the February 9, 2010 letter from David Sandino, referred to above. In that letter, Mr. Sandino states:

The question before the Board is whether the Kern River is fully appropriated or whether the Board should entertain water right applications because there is unappropriated water in the system. The Intertie operation simply does not affect that determination. The very purpose of the Intertie is only to take flows that will otherwise remain in the stream and cause damage at the bottom of the system. And, if those flows are diverted out of the stream under a water right – reducing or perhaps even eliminating the need for the Intertie to intercept them – so much the better from the flood perspective. It is the Department's view that from a flood control perspective, there is no inconsistency or objection to others taking water from the Kern under water rights that would otherwise be removed by Intertie flood operations.

(KR002213.)

Therefore, the Court finds for Respondent and Real Party in Interest SWRCB with respect to the First Cause of Action.

7. Substantial evidence supports the findings of the SWRCB.

Petitioners' Third Cause of Action alleges that the findings adopted by the SWRCB in WR Order 2010-0010 are not supported by the evidence. The scope of this Court's review of the SWRCB decision is whether the findings of the SWRCB were based on substantial evidence in light of the whole record. *Young v. Gannon* (2002) 97 Cal.App.4<sup>th</sup> 209, 225.

This means examining all relevant evidence in the entire record, considering both the evidence that supports the administrative decision and the evidence against it, in order to determine whether or not the SWRCB decision is supported by "substantial evidence." *Bixby v. Pterno*, *supra* 4 Cal.3d at p. 149, fn. 22. For this purpose "substantial evidence" has been defined in two ways: first as evidence of "ponderable legal significance . . . reasonable in nature, credible, and of solid value." *Ofsevit v. Trustees of Cal. State University & Colleges* (1978) 21 Cal.3d 763, 773, fn. 9; and, second, as "relevant evidence that a reasonable mind might accept as adequate to support a conclusion." *Hosford v. State Personnel Bd.* (1977) 74 Cal.App.3d 302, 307.

In this case, Petitioners have the burden of proving that the SWRCB's findings are not supported by substantial evidence. "[I]t is [the] appellant's burden to demonstrate that the administrative record does not contain sufficient evidence to support the agency's decision." *International Brotherhood of Electrical Workers v. Aubry* (1996) 42 Cal.App.4<sup>th</sup> 861, 870.

There are two issues that are presented in this case with respect to the findings adopted by the SWRCB in reaching its decision. First, whether the evidence presented established there has been a change in circumstances since the Kern River was included in the FAS Declaration and, second, whether there was sufficient hydrologic data, water usage data, or other relevant information to support a determination that there is unappropriated water in the Kern River system during the season applied for to justify revising the FAS Declaration. These were the two evidentiary issues included in the Key Issues adopted by the SWRCB in its Notice of Public Hearing and Pre-Hearing Conference. (KR001841.) These issues were repeated in the September 25, 2009 letter from the SWRCB to interested parties. (KR.001960.)

The Court notes that, as stated above, the decision of the SWRCB did not make any findings with respect to the effects of the North Kern decision. "[T]he evidence presented by the parties did not clearly resolve whether the partial forfeiture of Kern Delta's rights itself created any additional unappropriated water." (KR002410.) Instead, the SWRCB determined there was sufficient evidence based on the water entering the Intertie to find that there was unappropriated water in the Kern River and, therefore, good cause to revise the FAS Declaration. Accordingly, the Court has only reviewed the

record below with respect to the existence of substantial evidence to support the findings actually made by the SWRCB with respect to the existence of unappropriated water.

a. There is substantial evidence to establish a change in circumstances since the prior SWRCB consideration of the FAS Declaration for the Kern River.

As stated in the September 25, 2009 SWRCB letter, "the purpose of this proceeding is to determine whether there has been a change in circumstances since the Kern River was included in the Declaration, sufficient to justify the State Water Board revising the Declaration . . . ." (KR 001960.) The decision of the SWRCB also confirms that "the purpose of the hearing was to receive evidence and testimony regarding whether additional information has become available since the Board listed the Kern River as fully appropriated to justify the State Water Board revising the Declaration for the purpose of processing water right applications for the Kern River." (KR002409.) In order to evaluate the Board's consideration of this issue, it is first necessary to review the history of the SWRCB's determination that the Kern River has been fully appropriated.

In 1964, the SWRCB issued a comprehensive water rights decision, D1196, that determined the entire flow of the Kern River had been apportioned among First Point, Second Point and Lower-River diverters by court decisions, decrees and agreements since 1894.<sup>3</sup> (KR005228-32; 5536.) D1196 was based, in part, on the SWRCB's engineering staff's conclusion, based on a 70-year period of record that the entire Kern River natural flow had been diverted for irrigation within the First Point, Second Point and Lower-River areas since prior to 1894. (KR005232; 005280; 005537.) This 70-year analysis covered the period from 1894 through 1963. The SWRCB found that a "comparison of the quantities of water used in the First Point, Second Point and Lower-River Service Areas for the period of 1894-1963, with the quantities of water flowing past the First Point of Measurement, adjusted to eliminate the effect of Isabella Reservoir, shows that there is no water surplus." (KR005538.)

With the adoption of Water Code section 1205 et seq. authorizing the adoption of a declaration of fully appropriated stream and forbidding the processing of water right applications on stream systems that had previously been determined to be fully appropriated, the SWRCB adopted the FAS Declaration with respect to the Kern River in 1989. When it adopted the FAS Declaration, contained in WR 89-25, the SWRCB determined that D1196 contained "ample substantial evidence to support the finding that no water remains available for appropriation." (KR005551.)

Petitioners point to the SWRCB's decision in WR 94-1 wherein the SWRCB denied a petition seeking to revoke and revise the Kern River FAS Declaration based on years of extraordinarily high flows occurring since the adoption of D1196. The years discussed in

<sup>3</sup> As a result of a lengthy history of agreements and litigation commonly referred to by the parties as the "law of the river" the rights to the Kern River are divided among various classes of users. "First Point" diverters are the upstream appropriators; "Second Point" diverters are the downstream riparian interests; and Lower-River diverters are essentially those with rights subordinate to the First Point and Second Point diverters.

WR 94-1 were 1966, 1967, 1969, 1978, 1980 and 1983. (KR005567-69.) The SWRCB concluded that the flows submitted did not exceed the flows reported for the 1894-1963 period and "are far less than the maximum flows reported in the Engineering Staff Analysis of Record which formed the basis for finding that there is no unappropriated water in the Kern River. (KR005569.)

The evidence relied on by the SWRCB related to the following months and/or years in which there may be unappropriated water in the Kern River:

1. 1978 (KR004981)
2. 1980 (KR004981)
3. 1982 (KR004981)
4. December 1982 (KR002726-27; 007021)
5. 1983 (KR004981)
6. August, September November and December 1983 (KR002726-27; 007021)
7. 1984 (KR004981)
8. January 1984 (KR002726-27; 007021)
9. 1986 (KR004981)
10. 1997 (KR004981)
11. 1998 (KR004981)
12. 2006 (KR004981)

Mr. Easton also testified that although he could not recall the exact number of times water had reached the Intertie, "I recall that it occurred in, just forfeiture months from 1994 to 2008 it was," (KR002782.)

When comparing the years in which the SWRCB considered there may be unappropriated water to those years in which prior decisions had already considered flows to be completely appropriated, the evidence before the SWRCB indicates that it had not previously considered flows for the years 1982, 1984, 1986, 1997 and 1998.<sup>4</sup> There is

<sup>4</sup> While a portion of the record of the SWRCB proceedings related to WR 94-1 (KR005561) is included in the Administrative Record, Petitioners have not established that the flows considered by the SWRCB as set out at KR005567-69 are the flows entering the Intertie. Nevertheless, it is clear that there are flows in years not previously considered by the SWRCB that were the basis of its decision in the present proceedings.

also Mr. Easton's testimony concerning some months from 1994 to 2008. Based on this comparison, it is clear that there is sufficient evidence to determine there has been a change in circumstances from those considered in the prior SWRCB proceedings related to the FAS Declaration for the Kern River.

b. The SWRCB is not estopped from considering water entering the Intertie as unappropriated water.

The Court considers Petitioners' argument with respect to judicial estoppel to be closely related to the issue of whether there is evidence of a change in circumstances and so considers it here. Petitioners argue that the SWRCB and the City are judicially estopped from relying on water entering the Intertie as evidence of unappropriated water. Petitioners appear to claim the decision of the SWRCB in WR 89-25 is evidence that water entering the Intertie can never be considered unappropriated water. This claim is based on the SWRCB's rejection of the argument advanced by the Kern Property Corporation in the WR 89-25 proceedings that there was water available for appropriation because of the Intertie operation. The City disputed that "during high flows . . . into the California Aqueduct through the Kern River-California Aqueduct Intertie is some evidence of unappropriated water." (Petitioners' Reply Brief at p. 13; 19-20 citing from the Kern River Water Users' Response to Kern Property Corporation's Policy Statement Opposing Declaration re Kern River, of which this Court took judicial notice.)

First, the decision of the SWRCB in WR 89-25 did not base its decision on whether or not the operation of the Intertie supported a finding of unappropriated water. What the SWRCB decided was whether the language of D 1196 regarding an absence of a showing of the availability of unappropriated water was the same thing as a determination that no water is available for appropriation. The SWRCB concluded as follows:

If there is any ambiguity as to whether Decision 1196 determined that no water remains available for appropriation in the Kern River System, the Board is aided by the administrative record upon which the decision is based. That record contains ample substantial evidence to support a finding that no water remains available for appropriation. . . . Accordingly, the Board finds that Decision 1196 does determine that no water remains available for appropriation in the Kern River System.

(KR005551.) Petitioners argue that the SWRCB could not have reached this conclusion unless it rejected the argument that the Intertie created unappropriated water. While this may be true, the Court does not find the SWRCB to be estopped from considering whether flows into Intertie, not already considered by the SWRCB, may be unappropriated water.

Petitioners cite *International Engine Parts, Inc. v. Feddersen and Company* (1998) 64 Cal.App.4<sup>th</sup> 345 for the principles of judicial estoppel that should be applied in this case. In that case, the court states that "[t]he concept of judicial estoppel prevents a party from asserting a position in a judicial proceeding that is contrary or inconsistent with a position

previously asserted in a prior proceeding. The purpose is to protect the integrity of the judicial process and not the parties of the lawsuit. [Citation.] "The doctrine of judicial estoppel, sometimes referred to as the doctrine of preclusion of inconsistent positions, is invoked to prevent a party from changing its position over the course of judicial proceedings when such positional changes have an adverse impact on the judicial process." [Citation.]" *Id.* at p. 350.

The court in *International Engine Parts* went on to provide the elements required for the court to apply the equitable doctrine of judicial estoppel; 1) the same party has taken two positions; 2) the positions were taken in judicial or quasi-judicial administrative proceedings; 3) the party was successful in asserting the first position; 4) the two positions are totally inconsistent; and 5) the first position was not taken as a result of ignorance, fraud, or mistake. *Id.* at p. 351. Reviewing the facts asserted by Petitioners and the evidence in the record, they have not established all the elements of the doctrine.

With respect to the SWRCB, while necessarily a party in the proceeding before this Court, it may not be considered to be a "party" when acting in its adjudicatory function, such as when it rendered its decision in WR 89-25 or in the decision challenged in this action. There is certainly nothing in WR 89-25 to suggest it is a blanket decision related to the Intertie that would forever preclude the parties from considering flows that occurred in years subsequent to the adoption of WR 89-25. Nor could the SWRCB make such a determination.

California law specifically contemplates and authorizes a revision of the FAS Declaration based on new developments, new evidence or new circumstances. Water Code §1205(o); 23 Cal.Code of Regs. § 871(o). The courts have also explained that "[w]hat is unappropriated water is a constantly fluctuating question, depending upon the seasonal flow of the stream, the annual rainfall, the forfeiture of prior appropriations and default in the use of riparian rights. *Tulare Water C. v. State Water Commission* (1921) 187 Cal. 533, 537. Moreover, "[a] judicial determination as to existing appropriative and riparian rights rests upon then present uses which may be quite different at a later time." *Temesacal Water Co. v. Department of Public Works* (1955) 44 Cal.2d 90, 106. Simply put, the SWRCB is not precluded by the doctrine of judicial estoppel from determining, based on evidence provided to it, that there have been changed circumstances since it adopted WR 89-25 to justify the revocation of the FAS Declaration.<sup>5</sup>

c. There is substantial evidence in the record to support the SWRCB's finding that there may be unappropriated water in the Kern River.

Having concluded there is substantial evidence in the record to support the SWRCB's determination that there are sufficient changed circumstances since adopting the FAS Declaration for the Kern River, the Court turns to the issue of whether there is substantial

<sup>5</sup> Given that the SWRCB is not estopped from rendering a different decision than it reached in WR 89-25, the issue of the application of the doctrine of judicial estoppel to the City is moot.



evidence to support its finding that there are periods of flows that exceed recognized rights in the Kern River. As discussed below, the Court concludes the SWRCB's finding is supported by substantial evidence.

As the SWRCB recognized in its initial order, unappropriated water exists on a river when there is "hydrological data showing periods of flows exceeding recognized rights." (KR002409.) The SWRCB has previously explained that "in general, unappropriated water is determined by (1) quantifying the water physically available in the watershed and (2) subtracting the needs of riparian users and the claims of the holders of prior rights. The quantity of water surplus to the needs of riparian users and the claims of the holders of prior rights is available for appropriation." *In the Matter of Application 27253*, Order No. WR 86-1. See, also, *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908, 925, stating that "[a]ny water not needed for the reasonable beneficial uses of those having prior rights is excess or surplus water."

At the October 2009 hearing, the SWRCB received evidence from the City regarding excess, surplus diversions of water into the Intertie, which were depicted and quantified in the City's Exhibit 2-18. (KR004980.) This exhibit, based on the records maintained by the City, shows that the Intertie has accepted excess Kern River water six times, in seven different years. This exhibit also indicates that diversions into the Intertie have ranged from as little as 1,793 acre feet to as much as 664,036 acre feet.

The SWRCB also relied on evidence and testimony from Petitioners that established that excess, unappropriated water had been diverted into the Intertie. As explained by the SWRCB in WR-2010-0010, "the North Kern Petitioners presented a graph; exhibit JE 67 showing Kern River water 'undistributed to existing entitlements' in several years. Daniel Easton, witness for the North Kern Petitioners, explained in his written and oral testimony that there was what he calls 'undistributed release' water in at least eight months since 1964." (KR002409-10.) The SWRCB further stated that "Mr. Easton testified that water diverted into the Intertie is in excess of traditionally held and exercised rights and claims of right to Kern River water, and that whenever water has been released into the Intertie in the past, all Kern River water right claims had already been satisfied." (KR002410.)

Based on the evidence cited by the SWRCB, this Court finds that there is substantial evidence to support its findings regarding unappropriated water.

d. Petitioners have failed to establish water entering the Intertie is merely a change in use.

Petitioners' final argument with respect to the evidence in the record is that the water entering the Intertie is simply a lawful exercise by Kern River water right entitlement holders to change the point of diversion, place and purpose of water in accordance with agreements with other agencies. However, Petitioners have failed to identify any water rights which attached to the water diverted into the Intertie or identify which entity held

rights to the diverted water. The record below does not contain any evidence regarding claimed rights to the water entering the Intertie.

Therefore, the Court finds for Respondent and Real Party in Interest SWRCB with respect to the Third Cause of Action.

Accordingly, the Petition for Writ of Mandate is denied.

**DECLARATION OF SERVICE BY OVERNIGHT COURIER**

Case Name: *North Kern Water Storage District et al. v. State Water Resources Control Board*

Case No.: Kern County Superior Court No. S-1500-CV 270613 NFT

I declare:

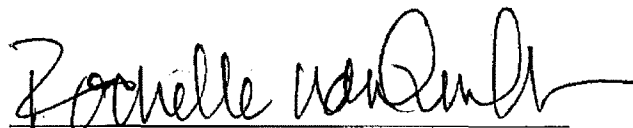
I am employed in the Office of the Attorney General, which is the office of a member of the California State Bar, at which member's direction this service is made. I am 18 years of age or older and not a party to this matter; my business address is: 1300 I Street, Suite 125, P.O. Box 944255, Sacramento, CA 94244-2550. I am familiar with the business practice at the Office of the Attorney General for collection and processing of correspondence for overnight mail with the **GOLDEN STATE OVENIGHT**. In accordance with that practice, correspondence placed in the internal mail collection system at the Office of the Attorney General is deposited with the overnight courier that same day in the ordinary course of business.

On August 15, 2011, I served the attached **NOTICE OF ENTRY OF JUDGMENT DENYING PETITION FOR WRIT OF ADMINISTRATIVE MANDATE** by transmitting a true copy via electronic mail. In addition, I placed a true copy thereof enclosed in a sealed envelope, in the internal mail system of the Office of the Attorney General, for overnight delivery, addressed as follows:

**SEE ATTACHED SERVICE LIST**

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on August 15, 2011, at Sacramento, California.

\_\_\_\_\_  
Rochelle Uda-Quillen  
Declarant

  
\_\_\_\_\_  
Signature

SA2010302141  
31323525.doc

AR-SUPP-000046

**SERVICE LIST**

***North Kern Water Storage District et al. v. State Water Resources Control Board  
Kern County Superior Court no. S-1500-CV 270613 NFT***

Scott K. Kuney  
Young Wooldridge, LLP  
1800 30th Street, 4th Floor  
Bakersfield, CA 93301-5298  
Email: [skuney@youngwooldridge.com](mailto:skuney@youngwooldridge.com)  
*Attorney for North Kern Water Storage District*

Jason M. Ackerman, Esq.  
Best, Best & Krieger LLP  
3750 University Ave., Suite 400  
P.O. Box 1028  
Riverside, CA 92502-1028  
Email: [Jason.ackerman@bbklaw.com](mailto:Jason.ackerman@bbklaw.com)  
*Attorney for City of Shafter*

Daniel N. Raytis, Esq.  
McMurtrey, Harstock and Worth  
2001 22nd St., Suite 100  
Bakersfield, CA 93301  
Email: [gene@mcmurtreyhartsock.com](mailto:gene@mcmurtreyhartsock.com)  
Email: [dan@mcmurtreyhartsock.com](mailto:dan@mcmurtreyhartsock.com)  
*Attorney for Buena Vista Water Storage District*

Kevin O' Brien, Esq..  
Downey Brand LLP  
621 Capitol Mall, 18th Floor  
Sacramento, CA 95814  
Email: [kobrien@downeybrand.com](mailto:kobrien@downeybrand.com)  
*Attorney for Kern Water Bank Authority*

Nicholas A. Jacobs  
Somach Simmons & Dunn  
500 Capitol Mall, Suite 1000  
Sacramento, CA 95814  
Email: [njacobs@somachlaw.com](mailto:njacobs@somachlaw.com)  
*Attorney for Kern County Water Agency*

Colin Pearce  
Duane Morris LLP  
Suite 2200  
One Market Plaza, Spear Tower  
San Francisco, CA 94105-1127  
Email: [CLPearce@duanemorris.com](mailto:CLPearce@duanemorris.com)  
*Attorneys for City of Bakersfield*

**NOT TO BE PUBLISHED IN THE OFFICIAL REPORTS**

California Rules of Court, rule 8.1115(a), prohibits courts and parties from citing or relying on opinions not certified for publication or ordered published, except as specified by rule 8.1115(b). This opinion has not been certified for publication or ordered published for purposes of rule 8.1115.

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

FIFTH APPELLATE DISTRICT

NORTH KERN WATER STORAGE  
DISTRICT et al.,

Plaintiffs and Appellants,

v.

STATE WATER RESOURCES CONTROL  
BOARD,

Defendant and Respondent;

CITY OF BAKERSFIELD,

Real Party in Interest and Respondent.

F063989

(Super. Ct. No. S-1500-CV-270613)

**OPINION**

APPEAL from a judgment of the Superior Court of Kern County. Stephen D. Schuett, Judge.

Law Offices of Young Wooldridge, Scott K. Kuney, Ernest A. Conant, and Alan F. Doud for Plaintiff and Appellant North Kern Water Storage District.

Best, Best & Krieger, Jill N. Willis and Jason Ackerman for Plaintiff and Appellant City of Shafter.

McMurtrey, Hartsock & Worth, Gene R. McMurtrey and Daniel N. Raytis for Plaintiff and Appellant Buena Vista Water Storage District.

Somach Simmons & Dunn and Nicholas A. Jacobs for Plaintiff and Appellant  
Kern County Water Agency.

Kamala D. Harris, Attorney General, Kathleen A. Kenealy, Assistant Attorney  
General, Denise Ferkich Hoffman and Matthew G. Bullock, Deputy Attorneys General,  
for Defendant and Respondent.

Virginia Gennaro, City Attorney; Duane Morris and Colin L. Pearce for Real Party  
in Interest and Respondent.

-ooOoo-

This is an appeal from a judgment denying a petition for writ of administrative  
mandate. (See Code Civ. Proc., § 1094.5, subd. (f).) The trial court concluded appellants  
were beneficially interested parties with a right to bring the petition to review  
respondent's administrative decision and, addressing the merits of the petition, rejected  
appellants' challenges to the administrative decision. We conclude, to the contrary, that  
appellants have not demonstrated a beneficial interest, as that term is defined in the case  
law, sufficient to challenge respondent's administrative orders at issue in this proceeding.  
Respondent's orders do not adversely affect any protected interest of any appellant. For  
this reason, we dismiss the appeal thereby, in net effect, affirming the judgment rejecting  
appellants' challenges to the administrative decision. (See Code Civ. Proc., § 913.)

## **FACTS AND PROCEDURAL HISTORY**

### *General Background*

In general terms, a person or entity not owning property along a stream or river  
could, prior to 1914, establish a right to use available water in the stream or river by  
giving notice of a claim and actually using the water. (See Hutchins, *The Cal. Law of  
Water Rights* (1956) p. 86 et seq.) These pre-1914 rights have come to be known as  
nonstatutory rights of appropriation. (*Id.* at p. 86.) (The law governing riparian use is  
different (*id.* at pp. 52-56); this case does not involve riparian rights, i.e., the rights

accruing to property owners because their property abuts the river (see *id.* at p. 179 et seq.).)

In 1914, the Water Commission Act went into effect. Thereafter, the right to appropriate water could only be established through a statutory procedure. (Hutchins, *The Cal. Law of Water Rights*, *supra*, at pp. 94-95.) The Water Commission Act is now codified in the Water Code at sections 100 to 4407.<sup>1</sup> The procedure for granting statutory rights to appropriate water is administered by a body now known as the State Water Resources Control Board, respondent in this appeal (hereafter respondent or the board). (See § 174; Hutchins, *The Cal. Law of Water Rights*, *supra*, at pp. 96-97.)

Nonstatutory appropriative rights are “senior” or “junior” to one another, normally depending upon the date of appropriation. However, the owner of a nonstatutory right of appropriation is permitted to change the purpose and place of use of the water, and to sell or otherwise transfer the right. (*North Kern Water Storage Dist. v. Kern Delta Water Dist.* (2007) 147 Cal.App.4th 555, 559 (*North Kern*).) Thus, changes in ownership of nonstatutory rights of appropriation do not alter the seniority—that is, the relative priority—of such rights, but such changes in use or ownership must not injure others with rights in the watercourse. (*Ibid.*) All use of water must be reasonable and beneficial. (*Ibid.*; see Cal. Const., art. X, § 2 [rights limited to water “reasonably required for the beneficial use to be served”].)

Nonstatutory rights of appropriation have sequential priority. That is, when the river flow is insufficient to supply all appropriators, the highest priority appropriator (usually the right established the earliest) is entitled to its full appropriation before the next highest is entitled to any, and so forth, throughout the hierarchy of rights holders; there is no mandatory proration of the available flow of the river. (*North Kern*, *supra*,

---

<sup>1</sup> All further statutory references are to the Water Code unless otherwise indicated.

147 Cal.App.4th at p. 561.) Further, pre-1914 nonstatutory rights have priority over statutory rights granted in Water Code proceedings. (*North Kern, supra*, at p. 583.)

Appellants North Kern Water Storage District (North Kern), Kern County Water Agency, and Buena Vista Water Storage District own nonstatutory rights to appropriate water from the Kern River.<sup>2</sup> Appellant City of Shafter apparently does not own rights directly, but uses water supplied through North Kern's rights.

Although there have been sales and consolidations of ownership of Kern River appropriative rights, there have been no new appropriative rights in well over a century. For example, in a 1964 adjudicative decision of respondent's predecessor agency, which rejected appropriation applications from some of the present appellants, the board found there was no unappropriated water available in the Kern River system. (Cal. Water Rights Bd., Decision D 1196 (Oct. 29, 1964), p. 5, at <[http://www.swrcb.ca.gov/waterrights/board\\_decisions/adopted\\_orders/decisions/d1150\\_d1199/wrd1196.pdf](http://www.swrcb.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1150_d1199/wrd1196.pdf)> [ as of Mar. 20, 2013] (D 1196).) When there is no water available for new appropriations on a river system, the river is described as "fully appropriated." Respondent most recently affirmed its order that the Kern River was fully appropriated in 1998.

After the river became fully appropriated, there were periodic disputes among the numerous rights holders, which resulted in a court decree and a contractual agreement that, together, governed operation of the river for most of the 20th Century. (D 1196, *supra*, at p. 3.) In 1976, however, one of the rights holders, Kern Delta Water District (Kern Delta), announced plans to increase usage of water over the historical usage of its

---

<sup>2</sup> The nature of North Kern's right to water from the Kern River is disputed by the City of Bakersfield. For purposes of this appeal, as we will discuss below, it does not matter whether North Kern owns nonstatutory appropriative rights or, instead, receives water pursuant to an agreement with the owner of such rights. In either case, the water is taken pursuant to a pre-1914 appropriation. The present proceeding does not involve an adjudication of North Kern's rights.



predecessors in interest. North Kern objected and sued to establish that the right to greater usage had been forfeited by Kern Delta's predecessors. (See *North Kern, supra*, 147 Cal.App.4th at p. 567.) The case resulted in two long trials and two appeals, at the end of which it was determined that Kern Delta's rights had been reduced through nonuse. (*Id.* at pp. 581-582.)

The published appellate opinion in *North Kern* noted that appropriative rights holders, junior in priority to the forfeited Kern Delta rights, had the right to the water freed up by the forfeiture judgment to the extent and in the order of seniority of their appropriative rights. (*North Kern, supra*, 147 Cal.App.4th at p. 583.) If the forfeiture of rights resulted, however, in water that exceeded the claims of those junior appropriators, such water would be "unappropriated" and would be subject to appropriation through respondent's statutory permitting process. (*Id.* at pp. 583-584; see also § 1206.) The *North Kern* opinion concluded that the determination whether a forfeiture resulted in unallocated water—that is, whether the forfeited water exceeded the claims of existing rights holders—was a matter within respondent's administrative jurisdiction and would not be determined in the first instance by the courts in the forfeiture proceedings. (147 Cal.App.4th at p. 583.)

The determination whether forfeited water rights results in unappropriated water is governed by the statutory procedure established in the Water Code. Prior to the 1987 enactment of sections 1205 through 1207 (see Stats. 1987, ch. 788), respondent was required to "consider and act upon all applications for permits to appropriate water and to do all things required or proper relating to those applications." (Legis. Counsel's Dig., Sen. Bill No. 1485, 4 Stats. 1987 (1987-1988 Reg. Sess.) Summary Dig., p. 244.) The 1987 legislation permitted respondent to adopt a declaration that a river was fully appropriated when, based upon previous water rights decisions, respondent determined "that no water remains available for appropriation." (§ 1205, subd. (b).) Once a river system has been designated by respondent as "fully appropriated," the governing statutes

prohibit respondent from accepting and processing applications for new permits to appropriate water from the river (with certain exceptions not relevant here). That was the case concerning the Kern River at the time of the published appellate opinion in *North Kern*. (See *North Kern, supra*, 147 Cal.App.4th at p. 583.) As a result, the first step in determining whether the adjudicated forfeiture of Kern Delta's rights resulted in unappropriated water involves invocation of the statutory process by which respondent reevaluates the fully appropriated status of a river system. While the Water Code prohibits respondent from accepting applications for permits to appropriate water from fully appropriated rivers, the code permits respondent to accept petitions to *revoke or revise* the "fully appropriated" designation of a river system, or to make such a determination on its own motion, after notice and hearing. (§ 1205, subd. (c).)

#### *The Present Case*

On the same day the Supreme Court denied review of the *North Kern* decision, April 25, 2007, appellants North Kern and City of Shafter filed a petition with respondent to consider the propriety of revoking or revising the declaration that the Kern River was fully appropriated. In the following weeks and months, City of Bakersfield (Bakersfield), Kern Water Bank Authority, and the remaining appellants filed similar petitions. Appellants' petitions were based on similar theories: They contended the Kern River probably remained fully appropriated but the *North Kern* forfeitures presented a reasonable basis for respondent to examine in a formal hearing whether the forfeitures freed additional water for appropriation. Appellants sought to appropriate such water if it was found to exist, but they urged respondent to limit its inquiry to the availability of forfeited water. Bakersfield's petition contended, as the city has throughout these proceedings, that all water rights forfeited through the *North Kern* proceeding became available as unappropriated waters notwithstanding any claims by entities with junior

water rights.<sup>3</sup> In addition, Bakersfield alleged that water was being taken in excess of various appropriators' rights, requiring respondent's intervention in the allocation of water from the river.<sup>4</sup> Kern Water Bank Authority's petition contended that the *North Kern* decision constituted a change in circumstances that justified revocation or revision of the "fully appropriated" designation. In addition, the petition contended that "[s]ince at least 1986" the Kern River Watermaster<sup>5</sup> has been permitting any person or entity to divert from the river any abnormally high water flow that otherwise would be diverted into the California Aqueduct pursuant to the formal policy and agreement among all the holders of appropriative rights to the Kern River, with the implication that such water is in excess of the rights of all such rights holders.<sup>6</sup> The physical structure through which flood water from the Kern River is diverted into the California Aqueduct is a federal flood control project known as the Intertie. The purpose of diversion of water into the Intertie is to prevent flooding in the Kern River basin. The water is transported for use in Southern California; at times of such diversion from the Kern River, the operator of the California Aqueduct reduces the flow of water into the aqueduct from rivers further north

---

<sup>3</sup> The *North Kern* opinion expressly rejected that contention by Bakersfield. (See *North Kern, supra*, 147 Cal.App.4th at p. 583.)

<sup>4</sup> Bakersfield was named in the petition for writ of mandate as a real party in interest. It has filed a separate brief in this appeal in the same capacity, seeking affirmance of the judgment.

<sup>5</sup> The watermaster, as the name implies, is charged with allocation of water, resolution of disputes among water claimants, maintenance of records of distribution, and serving as a clearing house for daily orders for water by various rights holders. In this case, an employee of the Bakersfield Water Resources Department serves as watermaster. An employee of Buena Vista Water Storage District serves as watermaster for diversions from the lower part of the river.

<sup>6</sup> Kern Water Bank Authority joined in the petition for writ of mandate in the lower court, but is not a party to the present appeal.

in California, in order to create capacity to receive Kern River flood waters. In our discussion of this flood water, we will refer to it as “Intertie water.”

After review of materials submitted by the various petitioners, respondent’s Chief, Division of Water Rights, determined there was reasonable cause to conduct a hearing on the question of whether the Kern River remained a fully appropriated stream system. (See Cal. Code Regs., tit. 23, § 871, subd. (c)(1), (4).<sup>7</sup>) The memorandum supporting the reasonable cause determination stated the forfeiture decision in *North Kern* “can be considered a change in circumstances” since the previous designation of the river as fully appropriated. However, the primary basis for recommending a hearing was that the diversion of Intertie water “on numerous occasions since its construction in 1977 confirms that there has been a change in circumstances since D1196,” the 1964 declaration of fully appropriated status.

The hearing on the petition occurred on October 26 and 27, 2009, before a member of the state water board, appointed as hearing officer for the proceeding. Respondent’s Order No. WR-2010-0010, removing the designation of the Kern River as fully appropriated, was adopted by respondent on February 16, 2010. The various parties’ petitions for rehearing were denied in Order No. WR-2010-0016, adopted on May 4, 2010.

Order No. WR-2010-0010 reached two conclusions: First, “the evidence presented by the parties did not clearly resolve whether the partial forfeiture of Kern

---

<sup>7</sup> California Code of Regulations, title 23, section 871, subdivision (c)(1) provides in relevant part that a petition to revoke or amend fully appropriated status shall include relevant information from which “the Chief, Division of Water Rights, may determine that reasonable cause exists to conduct a hearing on the question whether the fully appropriated status of the stream system should be revoked or revised.” Subdivision (c)(4) provides: “If the Chief determines that the petition shows reasonable cause to conduct a hearing . . . , the Chief shall notice a hearing on the issue. The board may thereafter adopt an order changing the declaration [of fully appropriated status] or declining to do so.”

Delta's rights itself created any additional unappropriated water." Second, the evidence showed that "in nine separate years since 1978" water in excess of water claimed by Kern River rights holders had been diverted into the Intertie as a flood control measure. Because of the evidence that "whenever water has been released into the Intertie in the past, all Kern River water right claims had already been satisfied," "[t]his water is, by definition, unappropriated water." Respondent therefore amended the Declaration of Fully Appropriated Streams "to allow for processing the applications to appropriate water from the Kern River in accordance with the provisions of the Water Code and other applicable law." Order No. WR-2010-0010 expressly recognized that respondent had not determined "the specific amounts of water available for appropriation under the applications, the season of water availability, the public interest in approval or denial of the applications, and any conditions to be included in any permits that may be issued on the applications." The order stated the focus of the board's inquiry "was on the relatively narrow task of determining if the evidentiary record supports revising the fully appropriated status of the Kern River."

The petitions for reconsideration contended that, if there was insufficient evidence to demonstrate that the *North Kern* decision did not result in unappropriated water beyond the claims of existing rights holders, then the petitions to revoke the fully appropriated designation should have been denied. In the alternative, the reconsideration petitions requested that respondent reopen the hearing to receive further evidence concerning the effects of the *North Kern* decision on the fully appropriated status of the Kern River. Finally, with respect to the Intertie water, the petitioners requested that respondent amend the order to "clearly state that occasional flood flows are not the basis for amending the [fully appropriated stream] declaration absent an application' to place such waters to beneficial use ...."

Respondent denied the petitions for reconsideration by Order No. WR-2010-0016. Respondent determined it was under no statutory mandate to determine the availability of

unappropriated water based on the *North Kern* decision “at this stage.” All that was required to justify revocation of the fully appropriated designation was a “change in circumstance” that “demonstrates that there is unappropriated water on the Kern River.” “[T]he determination whether sufficient unappropriated water is available for the diversion and use proposed under an application can best be decided in proceedings to issue or deny a permit on that application.”

Appellants filed a petition for writ of administrative mandate on June 2, 2010. The petition contended respondent acted in excess of its jurisdiction because the water that was the basis for revocation of the fully appropriated designation was flood water lawfully diverted under other laws, and was not unappropriated water over which respondent has jurisdiction. In addition it contended respondent lacked jurisdiction because it had not properly acted on respondent’s own motion and it had not actually granted any party’s petition for revocation of the declaration. (§ 1205, subd. (c).) The petition asserted that respondent abused its discretion by adopting findings that were not supported by substantial evidence. Finally, the petition claimed that respondent abused its discretion by failing to declare the Kern River continued to be fully appropriated, arguing there was no evidence presented that the *North Kern* decision resulted in any unappropriated water in excess of the rights of junior appropriators.

After receiving points and authorities and holding a hearing on the petition, the trial court denied the petition for writ of administrative mandate. The court rejected Bakersfield’s contention that appellants lacked standing to bring the writ petition. It determined any person or entity permitted by section 1205 to file a petition to revoke or revise a fully appropriated declaration retains that statutory standing in any proceeding “to test before a court of law the legality of [respondent’s] final decision.” The trial court determined respondent was not required under the terms of the *North Kern* decision to resolve in the present proceeding whether the decision resulted in unappropriated water. The court determined respondent had jurisdiction to conduct the hearing under

section 1205, subdivision (c). The trial court concluded substantial evidence supported respondent's determination that the water diverted into the Intertie was unappropriated and that this determination supported further proceedings on applications for new appropriations of that water. After receiving written objections to the ruling, the trial court issued a final judgment on July 21, 2011, adopting the court's June 14, 2011, statement of decision and denying the petition for writ of administrative mandate.

### DISCUSSION

At the trial court hearing, respondent and Bakersfield contended appellants had not demonstrated any manner in which they were adversely affected by respondent's Order Nos. WR-2010-0010 and -0016. In their initial briefs on appeal, no party renewed this contention. Pursuant to Government Code section 68081, this court requested appellants address this issue by supplemental brief. (See *Walton v. City of Red Bluff* (1991) 2 Cal.App.4th 117, 129 [appellate court may raise issues on its own motion if it complies with Gov. Code, § 68081].)

Code of Civil Procedure section 1086 provides that a writ of mandate "must be issued upon the verified petition of the party beneficially interested" when an administrative board has denied the petitioner "use and enjoyment of a right or office to which the party is entitled ..." (*id.*, § 1085). (See also *id.*, § 1094.5 [standards for issuance of properly filed writ after final administrative order or decision]; *Sacramento County Fire Protection Dist. v. Sacramento County Assessment Appeals Bd.* (1999) 75 Cal.App.4th 327, 331 ["beneficial interest" requirement applies both to ordinary mandate and administrative mandate proceedings].) A party is "beneficially interested" for these purposes if the party has "some special interest to be served or some particular right to be preserved or protected over and above the interest held in common with the public at large." (*People ex rel. Dept. of Conservation v. El Dorado County* (2005) 36 Cal.4th 971, 986.) This standard, the Supreme Court has stated, "is equivalent to the federal "injury in fact" test, which requires a party to prove by a preponderance of the evidence



that it has suffered “an invasion of a legally protected interest that is [both] ‘(a) concrete and particularized, and (b) actual or imminent ....’” [Citation.]” (*Ibid.*; see also *Save the Plastic Bag Coalition v. City of Manhattan Beach* (2011) 52 Cal.4th 155, 165.)

*Savient Pharmaceuticals, Inc. v. Department of Health Services* (2007) 146 Cal.App.4th 1457, provides an example of the “beneficial interest” requirement. Savient was the manufacturer of a drug used in certain instances to treat a condition related to HIV. The Department of Health Services (the department) had a program under which certain HIV drugs were provided to persons not eligible for Medi-Cal. At various times, due to the cost of Savient’s drug and the budgetary restrictions on the program, the drug was listed and delisted for use on certain male patients. (*Id.* at pp. 1461-1463.) The program was administered by Ramsell Corporation under a contract with the department. The department, however, was the only entity involved in the decision to delist Savient’s drug. (*Id.* at p. 1463.) After the department delisted Savient’s drug, Savient filed a petition for writ of mandate in which it sought “to invalidate the delisting and to nullify the Department’s contract with Ramsell.” (*Id.* at p. 1461.) The trial court, among other rulings, concluded Savient lacked standing to challenge the contract between the department and Ramsell. The Court of Appeal affirmed this ruling. (*Id.* at p. 1465.) After setting forth the requirements for “beneficial interest” established in prior Supreme Court cases, the *Savient* court concluded that “[n]othing done by virtue of the Ramsell contract hurt Savient. Because the contract did not specially aggrieve Savient, it lacks standing to attack the contract.” (*Ibid.*)

The Water Code provides a similar standard specifically applicable in the present case: “Any party aggrieved by any decision or order may, not later than 30 days from the date of final action by the board, file a petition for a writ of mandate for review of the decision or order.” (§ 1126, subd. (b).) In *State Water Resources Control Bd. Cases* (2006) 136 Cal.App.4th 674, the Court of Appeal concluded the language of section 1126 incorporated the same requirements of a direct and immediate injury that is encompassed



in the “beneficial interest” standard of the general mandamus statute. (136 Cal.App.4th at pp. 829-830.) In addition, the court concluded the “aggrieved” requirement of section 1126 adopted the same standards of direct and immediate injury encompassed in the statutory requirement that only an “aggrieved” party is permitted to appeal from a civil judgment. (136 Cal.App.4th at p. 829.)

In the relevant portion of *State Water Resources Control Bd. Cases, supra*, 136 Cal.App.4th, owners of land outside the designated geographic area for use of irrigation water supplied by certain appropriators (*id.* at p. 821, fn. 60), contended on appeal that the board had erred in imposing environmental impact measures when it expanded the geographical service area to include the owners’ land in an expanded-use area. (*Id.* at p. 828.) The Court of Appeal noted the mitigation measures were applicable only to the original appropriator, the United States Bureau of Reclamation (Bureau), as operator of the Central Valley Project. (*Id.* at pp. 829-830; see *id.* at pp. 687-688.) The court found that because the board had not imposed any mitigation measures on the land owners and “there [was not] any evidence in the record the Bureau intended to pass on the cost of mitigation” to the land owners, they were not aggrieved by the board’s order. (*Id.* at p. 830.) The owners also contended they were aggrieved by the uncertainty created by the possibility the Bureau would impose fees for mitigation in the future, and the prospect of “the expense, delay and risk of going through another prolonged and expensive administrative proceeding” to prove their lands were not subject to the mitigation requirements. (*Ibid.*) The court concluded this speculative injury did not constitute an “immediate, pecuniary, and substantial injury” that supported standing to pursue the appeal. (*Id.* at p. 831.)

In the present case, respondent has not even purported to adjudicate water rights. Instead, Order No. WR-2010-0010 specifically provides that no determination has been made concerning the amount of water that will be taken by existing rights holders, and that this will be an issue only in future proceedings in which applicants for new water

permits will be required to prove “when and how much available water there is for appropriation.” Further, no permit for new appropriation of water will affect the holders of nonstatutory appropriative rights. (*North Kern, supra*, 147 Cal.App.4th at pp. 583-584; see *Allen v. California Water & Tel. Co.* (1946) 29 Cal.2d 466, 489.)

The trial court ruled that any party with standing to initiate *administrative* proceedings as an “interested person” under section 1205 must also be entitled to initiate *judicial* proceedings to review “the legality” of any resulting administrative decision. In the cases cited for that proposition, however, the party who sought judicial review was in fact aggrieved by the outcome of the administrative hearing. Thus, in *Bodinson Mfg. Co. v. California Emp. Com.* (1941) 17 Cal.2d 321, an employer sought review of an administrative order awarding unemployment benefits to its former employee. (*Id.* at p. 324.) First, the court noted that an employer was specifically permitted by the statute to intervene in an unemployment compensation hearing as an “interested party.” Second, although the court did state that, “it seems to us that elemental principles of justice require that parties to the administrative proceeding be permitted to retain their status as such throughout the final judicial review by a court of law, for the fundamental issues in litigation remain essentially the same,” this statement was dicta. (*Id.* at p. 330.) The issue before the court was not whether a party which had not been adversely affected by the administrative order could petition for mandamus review. Instead, the court noted that the employer’s reserve account—its required contribution to the unemployment compensation fund—would be affected by the compensation award; accordingly, “it seems apparent that the employer whose reserve account is affected is the only person having sufficient incentive to challenge a decision awarding benefits. Action by this employer provides the only procedural guarantee that the commission can be held by legal process to comply with the requirements of the statute under which it operates.” (*Ibid.*) Thus, in *Bodinson*, the party which sought judicial review was aggrieved by the administrative order.

In *Temescal Water Co. v. Department of Public Works* (1955) 44 Cal.2d 90, the board issued a water appropriation permit to a conservation district allowing it to take water from a creek. The appellants were appropriators with existing rights; they filed a petition for writ of mandate to challenge the administrative order. Judgment for the board was granted after its demurrer to the petition was sustained. (*Id.* at p. 93.) The primary issue in the case was the appellants' claim that the board was not entitled to determine, in the course of considering an application for a new appropriation permit, that there was unappropriated water in a stream, in other words, that the determination of unappropriated water was a judicial function in the first instance, not a matter for administrative order. (*Id.* at p. 94.) The court rejected this contention, and held that the board was permitted to determine whether unappropriated water exists as part of its consideration of an application for a new permit. (*Id.* at p. 106.) "If the [board] erroneously concludes that unappropriated water is available to supply an applicant when there is no reasonable expectation of such a supply, the error may be corrected upon a review of the determination. But a holding that such a danger is so imminent as to justify an independent judicial proceeding to determine the availability of unappropriated water before the [board] considers an application, would deprive the administrative proceeding of all of its proper functions in the issuance of a permit." (*Ibid.*) After concluding the issue was properly addressed in the administrative proceedings, the court briefly addressed the board's claim that the appellants were not interested parties in the administrative hearing nor parties with a beneficial interest sufficient to support mandamus relief. (*Id.* at p. 107.) In permitting the appellants to amend their petition to allege they had appeared in the administrative hearing and had objected to the application for a new permit, the court stated: "[S]tatutory authority allows them to present a protest to the application before the [board] ... and, if upon amendment to their petition they show their participation as interested parties in that proceeding, they *may* establish as *well* their interest in a judicial proceeding to review the [board's] determination." (*Ibid.*,

italics added.) The clear implication of the quoted passage, which cites to *Bodinson Mfg. Co. v. California Emp. Com.*, *supra*, 17 Cal.2d at page 330, as its sole supporting authority, is that the appellants might, upon filing an amended complaint, be able to allege a beneficial interest that was adversely affected by the order granting the new permit; the court did not hold that, merely by participating in the administrative hearing, the appellants automatically were entitled to maintain a petition for writ of mandamus.

The mere fact that a party has standing to participate in a proceeding in the original tribunal does not mean the party is entitled to appeal from that proceeding no matter what the result in the proceeding. There is an additional requirement that the party be “aggrieved,” in a civil proceeding or under section 1126, subdivision (b) of the Water Code, or a party be “beneficially interested” under Code of Civil Procedure section 1086. A party who has received essentially the relief it sought in the trial court is not permitted to appeal from the resulting order, even though the order, in the abstract, is an appealable order. (*Hensley v. Hensley* (1987) 190 Cal.App.3d 895, 898.) There is no logical reason the same rule should not apply to review of administrative orders. (See *Save the Plastic Bag Coalition v. City of Manhattan Beach*, *supra*, 52 Cal.4th at p. 165.) Unlike *Consolidated Irrigation Dist. v. City of Selma* (2012) 204 Cal.App.4th 187, 206, there is no potential that respondent’s administrative order will reduce, directly or indirectly, the water available to appellants under existing appropriative rights.

In rare instances, courts may grant “public interest” standing to a party who seeks review of an administrative decision. (*Save the Plastic Bag Coalition v. City of Manhattan Beach*, *supra*, 52 Cal.4th at p. 166.) Such standing is permitted when the issue involves a “public right” and the mandate petition seeks enforcement of a “public duty.” (*Ibid.*) “No party ... may proceed with a mandamus petition as a matter of right under the public interest exception,” however, and permitting a party to proceed on that basis is an exception to the usual “beneficial interest” requirement. (*Id.* at p. 170, fn. 5.) Even when the requirements for public interest standing are met, “[t]he policy

underlying the exception may be outweighed by competing considerations of a more urgent nature.” (*Ibid.*) In the present case, respondent generally recognizes the requirement that any permits it grants for appropriation of water will be subordinate to the existing interests of pre-1914 appropriators. Accordingly, there is no significant need for judicial intervention at this time to restrain the acts of an administrative agency that will, or is poised to, overstep its statutory authority. In the unlikely event respondent does issue permits that somehow impinge upon existing nonstatutory rights of appropriation, the injured parties at that point will have ample opportunity to obtain judicial review of respondent’s actions. (See *Sacramento County Fire Protection Dist. v. Sacramento County Assessment Appeals Bd.*, *supra*, 75 Cal.App.4th at p. 334 [“This is not a situation where the issue raised by the District will be removed from judicial review if standing is denied.”].) Accordingly, we conclude the present case, at this preliminary stage of the administrative proceeding, is not an appropriate case in which to confer public interest standing upon these appellants.

We wish to emphasize one further point. Throughout these proceedings, the parties and the board have used the words “appropriated” and “unappropriated” in two different senses, producing some confusion. In water law, “appropriated” refers to water to which a nonriparian owner asserts an enforceable right to take or use water. “Unappropriated” water is that water flowing in the streambed in excess of the rights claimed by appropriative and riparian users. (See §§ 1202, 1205, subd. (b).) In other words, “appropriated” and “unappropriated” refer only to the right to take or make use of water for a beneficial purpose. In common usage outside the realm of water law, “appropriated” means actual possession of or use of, whether with or without claim of right. (See *American Heritage Dict.* (3d college ed. 2000) p. 67, col. 1 [second meaning of “appropriate”].) Similarly, in common usage, something that is “unappropriated” has not actually been taken by anyone. Actual usage, rather than the right to use, is at the core of this common meaning of the terms.

Both of these meanings of “appropriated” and “unappropriated” have been used in the present case.<sup>8</sup> The evidence was clear, and essentially uncontroverted, that during occasional flood years water that is unappropriated—not physically claimed by any entity with a right to the water—has been diverted into the California Aqueduct and has been used, without claim of right, by Southern California water interests. Nevertheless, there was no evidence, and respondent’s administrative orders do not conclude, that the nonuse of flood water has resulted in the loss of the enforceable right to take or use. Forfeiture of the right to appropriate water occurs only upon the failure of a rights holder to beneficially use water in five consecutive years (§ 1241; *North Kern, supra*, 147 Cal.App.4th at p. 560). There is no evidence of this, and respondent has not determined there is unappropriated water resulting from such continued lack of beneficial use.

Respondent has neither asserted nor exercised the power to reduce the appropriative rights pursuant to which appellants now receive water. Accordingly, appellants are not aggrieved parties with a beneficial interest to support their petition for writ of administrative mandate, nor are they aggrieved parties entitled to maintain an appeal from the judgment denying their petition.

---

<sup>8</sup> For example, at the hearing in this case, the trial court asked: If “[n]ot all [appropriative] rights are exercised all the time,” is the resulting water unappropriated? Respondent’s counsel answered: “It’s unappropriated, absolutely. ‘Unappropriated’ means it’s -- it hasn’t been used.” Similarly, respondent’s counsel stated later in the hearing: “There is no determination in this order about water rights, who has water rights, who has what. It’s about the physical availability of water.”

**DISPOSITION**

The appeal is dismissed. As a result, the judgment affirming the administrative decision is affirmed. Respondents are awarded costs on appeal. (Cal. Rules of Court, rule 8.278(a)(2).)

---

DETJEN, J.

WE CONCUR:

---

CORNELL, Acting P.J.

---

PEÑA, J.



1 DOWNEY BRAND LLP  
 2 KEVIN M. O'BRIEN (CA Bar No. 122713)  
 3 MEREDITH E. NIKKEL (CA Bar No. 254818)  
 4 DAVID E. CAMERON (CA Bar No. 278061)  
 5 621 Capitol Mall, 18th Floor  
 6 Sacramento, CA 95814-4731  
 Telephone: 916.444.1000  
 Facsimile: 916.444.2100  
 kobrien@downeybrand.com  
 mnikkel@downeybrand.com  
 dcameron@downeybrand.com

5/15/02 - 2002  
 15:01:08 by 11.0

7 *Attorneys for Complainant,*  
 8 KERN WATER BANK AUTHORITY

9 STATE OF CALIFORNIA

10 STATE WATER RESOURCES CONTROL BOARD

11 KERN WATER BANK AUTHORITY,

12 Complainant,

13 v.

14 BUENA VISTA WATER STORAGE  
 15 DISTRICT and DOES 1 through 100

16 Respondent.

**COMPLAINT FOR (1) UNAUTHORIZED  
 DIVERSION OF WATER;  
 (2) FORFEITURE OF WATER RIGHTS;  
 (3) ABANDONMENT OF WATER  
 RIGHTS; AND (4) VIOLATION OF  
 ARTICLE X, SECTION 2 OF THE  
 CALIFORNIA CONSTITUTION AND  
 CAL. WATER CODE SECTION 100**

DOWNEY BRAND LLP

17 Complainant KERN WATER BANK AUTHORITY ("Authority") alleges against  
 18 Respondent BUENA VISTA WATER STORAGE DISTRICT ("Buena Vista") and DOES 1  
 19 through 100 as follows:

20 **INTRODUCTION**

21 1. The Kern River originates in the Sierra-Nevada mountains. The river is regulated  
 22 by Isabella Dam and Reservoir, which are located approximately 1.5 miles below the confluence  
 23 of the North and South Forks of the Kern River, roughly 50 miles northeast of the City of  
 24 Bakersfield. Below Isabella Reservoir, the Kern River flows through a canyon and then to the  
 25 floor of the San Joaquin Valley. The total drainage area of the Kern River watershed upstream of  
 26 Isabella Dam is approximately 2,075 square miles. Key features of the Kern River system are  
 27 depicted on the map attached hereto as Exhibit "A" and incorporated herein.

28 ///  
 1565993.6



1           2.       Diverters of water from the Kern River have historically been divided into three  
 2 groups: (i) those that divert from the First Point of Measurement, located approximately 45 miles  
 3 downstream of Lake Isabella; (ii) those that divert from the Second Point of Measurement,  
 4 located another 23 miles downstream; and (iii) those that utilize “Lower River” rights. These  
 5 points of measurement and categories of diverters originated in the 1888 Miller-Haggin  
 6 Agreement, as described below. However, neither the Miller-Haggin Agreement nor any other  
 7 contract can or do establish the scope, nature or extent of a water right. The scope, nature and  
 8 extent of all water rights on the Kern River can be determined only through the application of  
 9 California water rights law.

10           3.       The flow of the Kern River is highly variable from year to year, with the annual  
 11 natural flow at First Point ranging from a maximum of nearly 2.5 million acre-feet in 1983, to a  
 12 minimum of approximately 139,000 acre-feet in 2015. The average annual natural flow at First  
 13 Point over the 125-year period of record is approximately 714,500 acre-feet, and the median  
 14 annual natural flow is approximately 538,500 acre-feet.

15           4.       Buena Vista is the successor-in-interest to Miller & Lux, Incorporated (“Miller &  
 16 Lux”) as to certain pre-1914 appropriative water rights established by Miller & Lux to divert and  
 17 use water from the Kern River. The scope, nature and extent of the pre-1914 rights established by  
 18 Miller & Lux and subsequently acquired by Buena Vista is the central issue in this Complaint  
 19 proceeding.

20           5.       Buena Vista has recently asserted that it holds the right to *all* Kern River water that  
 21 reaches Second Point of Measurement, regardless of the source or character of such water.<sup>1</sup> In  
 22 furtherance of this assertion, Buena Vista has recently substantially increased the quantity of  
 23 water it diverts from the Kern River. The quantities of Buena Vista’s recent diversions, as  
 24 reported to the State Water Board, are described in paragraph 37 of this Complaint. Buena

25  
 26 <sup>1</sup> On January 14, 2019 Buena Vista filed a Petition for Writ of Mandate and Complaint for Declaratory Relief  
 27 (“Petition”) in Kern County Superior Court challenging the adequacy of the Authority’s Final Environmental Impact  
 28 Report for Water Right Application No. 31676. In that Petition, Buena Vista alleges in relevant part that “in a year of  
 Kern River surplus...Buena Vista will use all available 2nd priority recharge capacity in the KWB before water is  
 offered to the Intertie...Thus Buena Vista would utilize all available recharge capacity in the KWB before ‘high flow  
 water’ would become available to the KWB.” (Petition at ¶59.)

1 Vista's recent diversion amounts are unprecedented in the long history of Kern River operations  
2 by Buena Vista and its predecessor, Miller & Lux.

3 6. The Authority is informed and believes and thereon alleges that the recent  
4 substantial increase in Buena Vista's Kern River diversions is related to the recent enactment of  
5 the Sustainable Groundwater Management Act ("SGMA"). The Authority is informed and  
6 believes and thereon alleges that Buena Vista desires to claim as much Kern River water as  
7 possible so that it may profit from the sale and transfer of Kern River water to other water users  
8 within the Kern subbasin as such water users seek to comply with the requirements of SGMA.

9 7. In Orders WR 2010-0010 and WR 2010-0016, the State Water Board amended the  
10 Declaration of Fully Appropriated Streams ("FAS") for the Kern River "to allow for processing  
11 of applications to appropriate water from the Kern River." (Order WR 2010-0010, ordering  
12 para. 2, p. 7.) Orders WR 2010-0010 and WR 2010-0016 were adopted following an evidentiary  
13 hearing and were upheld by the Kern County Superior Court and the Fifth District Court of  
14 Appeal. Orders WR 2010-0010 and 2010-0016 are now final for all purposes.

15 8. In determining that the FAS Declaration should be amended "to allow for  
16 processing of applications to appropriate water from the Kern River," (Order WR 2010-0010,  
17 p. 7) the State Water Board cited, among other things, the following evidence presented at the  
18 evidentiary hearing by the "North Kern Petitioners," a group comprised of the Kern Water Bank  
19 Authority, Buena Vista Water Storage District, North Kern Water Storage District, Kern County  
20 Water Agency and the City of Shafter (*id.* at 2):

21 Likewise, the North Kern Petitioners presented a graph; exhibit JE  
22 67, showing Kern River water "undistributed to existing  
23 entitlements" in several years. Daniel Easton, witness for the North  
24 Kern Petitioners, explained in his written and oral testimony that  
25 there was what he calls "undistributed release" water in at least  
26 eight months since 1964. Mr. Easton testified that water diverted  
27 into the Intertie is in excess of traditionally held and exercised  
28 rights and claims of right to Kern River water, and that whenever  
water has been released into the Intertie in the past, all Kern River  
water right claims had already been satisfied. This water is, by  
definition, unappropriated water.

(*Id.* at 4-5; citations omitted).

///

1565993.6

1           9.       Based on the historical use of Kern River water by Buena Vista and its  
2 predecessor, Miller & Lux, Buena Vista's pre-1914 appropriative water right to the Kern River is  
3 no more than that which can reasonably and beneficially be used for irrigation purposes on  
4 approximately 50,000 acres of land. The annual volumetric quantity and other parameters of  
5 Buena Vista's pre-1914 appropriative right to the Kern River will be determined based on  
6 evidence to be presented at the adjudicatory hearing on this Complaint.

7           10.      Buena Vista's recent Kern River diversions in excess of its water rights constitute  
8 an unauthorized diversion and use of water in violation of Cal. Water Code section 1052 and  
9 other applicable law.

10          11.      Through this Complaint, the Authority seeks a determination by the State Water  
11 Board as to the scope, nature and extent of Buena Vista's pre-1914 appropriative water right on  
12 the Kern River. In addition, the Authority seeks a determination by the State Water Board that  
13 Buena Vista (i) has forfeited a substantial portion of its Kern River water rights according to  
14 proof at the adjudicatory hearing on this Complaint; (ii) has abandoned a substantial portion of its  
15 Kern River water rights according to proof at the adjudicatory hearing on this Complaint; and  
16 (iii) has violated Article X, section 2 of the California Constitution and Cal. Water Code section  
17 100 by diverting and using Kern River water in a wasteful and unreasonable manner as alleged in  
18 paragraphs 38-39 and 45-47 of this Complaint. The Authority respectfully requests that the State  
19 Water Board issue a cease and desist order barring Buena Vista from the diversion and use of  
20 Kern River water in excess of its water rights, and preventing Buena Vista from using, or  
21 employing methods of diversion for using, Kern River water in a wasteful and unreasonable  
22 manner.

23          12.      The Authority asserts no claim that First Point diverters are diverting or using  
24 Kern River water in excess of their water rights.

### JURISDICTION

25          13.      The State Water Resources Control Board ("Board") has jurisdiction over this  
26 proceeding under Article X section 2 of the California Constitution, Cal. Water Code sections  
27 1240, 1831, and 1052, and section 856 of Title 23 of the California Code of Regulations.  
28



**THE PARTIES**

14. The Authority is a joint exercise of powers authority formed in 1995 pursuant to Cal. Gov. Code section 6500, *et seq.*

15. The Authority stores available surface water underground and provides that water to its members in dry and critical years. During periods of storage the Authority not only conserves water for later use; it also provides exceptional wetland habitat that is utilized by wildlife and waterfowl, including migratory birds utilizing the Pacific Flyway.

16. On or about September 26, 2007, the Authority filed with the State Water Board an application to appropriate unappropriated water (later denominated Application No. 31676). Application No. 31676 also seeks an appropriative water right to store up to 500,000 AFY, with the total direct diversion and storage right not to exceed 500,000 in any year.

17. Buena Vista is a water storage district formed in 1924 pursuant to Cal. Water Code section 39000, *et seq.*

18. Each of the respondents identified as DOES 1 through 100, inclusive (“DOES 1-100”) are persons other than the named respondent who, whether as individuals, corporations, unincorporated associations, partnerships, trustees, executors, guardians, or otherwise, claim some right, title, estate, lien, or interest in beneficially using Kern River water diverted at or downstream of Second Point as defined herein. The Authority is unaware of the true names and identities of DOES 1-100 and therefore sues DOES 1-100 by fictitious names. The Authority will amend this pleading to reflect the true identifies and capacities of Does 1-100 once ascertained.

**GENERAL ALLEGATIONS**

**A. The Miller-Haggin Agreement**

19. In 1879, Henry Miller and Charles Lux initiated litigation against defendant James Ben-Ali Haggin related to the diversion of Kern River water. Miller and Lux owned land downstream of Haggin and asserted riparian rights to the natural flow of the river. Haggin, on the other hand, owned land away from the Kern River and claimed appropriative rights to divert water upstream from Miller.

///  
1565993.6

1           20.     After extensive litigation, including a California Supreme Court opinion, *Lux v.*  
 2 *Haggin* (1886) 69 Cal. 255, Miller and Haggin reached a private settlement agreement in 1888.  
 3 The 1888 Miller-Haggin Agreement provides that Kern River water shall be divided pursuant to  
 4 certain terms and measured at two specific locations entitled First Point of Measurement (“First  
 5 Point”),<sup>2</sup> located and Second Point of Measurement (“Second Point”).<sup>3</sup>

6           21.     The Miller-Haggin Agreement provides that all Kern River natural flow is to be  
 7 measured at First Point, and all flows up to and including 300 cubic-feet per second (“cfs”)  
 8 measured there are allocated to certain specific First Point diverters. All flows above 300 cfs are  
 9 divided 1/3 to the Second Point diverters (without losses) and 2/3 to the First Point diverters,  
 10 except during the period of September through February, when all the flow over 300 cfs is  
 11 allotted to the First Point diverters. The Miller-Haggin Agreement provides that all water of the  
 12 First Point diverters reaching the Second Point of Measurement is available for use by the Second  
 13 Point diverters.

14           22.     The Miller-Haggin Agreement was amended in 1930, 1955 and 1964. As  
 15 amended, the Miller-Haggin Agreement provides that for the six-month period of September  
 16 through February (“Non-Miller-Haggin Season”) when the flow at First Point is over 1,500 cfs,  
 17 the waters of the Kern River shall be apportioned each day between the First Point Diverters and  
 18 Second Point diverters, with First Point diverters being entitled to two-thirds of the total flow and  
 19 Second Point Diverters being entitled to one-third of the flow over 1,500 cfs. As alleged above,  
 20 Buena Vista holds rights solely to that portion of water that reaches Second Point that is within  
 21 the scope of its pre-1914 appropriative rights, as established and maintained in accordance with  
 22 California water law. Stated differently, neither the Miller-Haggin Agreement nor any other  
 23 contract can create a water right under California law.

24     **B. Buena Vista Lake**

25           23.     The Miller-Haggin Agreement outlined a plan to develop a storage facility known  
 26 as Buena Vista Lake. In this regard the Miller-Haggin Agreement provides in relevant part:

27           <sup>2</sup> Located in Section 35, Township 28 South, Range 28 East.

28           <sup>3</sup> Located in Section 24, Township 30 South, Range 25 East.

1           “levees should be constructed around a large lake known as Buena  
2           Vista Lake, into which a part of the water of the Kern River  
3           naturally ran, so as to make of said lake to some extent an artificial  
4           reservoir in which should be confined the waters of the river  
5           flowing at the second point, at times when there was more than  
6           was then in use by the [First Point diverters], to be there stored for  
7           use subsequently by the [Second Point diverters].”

8           (*See, Miller & Lux v. Kern County Land Co.* (1908) 154 Cal. 785, 786.)

9           24.     Following construction of Buena Vista Lake, Buena Vista and Miller & Lux  
10           entered into an agreement dated October 14, 1964 entitled Kern River Storage and Use of Water  
11           Agreement (the “BV Lake Agreement”) that governed use of Buena Vista Lake.

12           25.     The Authority is informed and believes, and based thereon alleges, that the  
13           principal purpose of the BV Lake Agreement was to set forth the terms by which water may be  
14           stored in Buena Vista Lake. The Buena Vista Lake storage facilities are described as having  
15           three surface water storage cells: (1) Cell 1 having a capacity of 18 thousand acre-feet (“TAF”);  
16           (2) Cell 2 having a capacity of 12.6 TAF; and (3) Cell 3’s capacity is undescribed. Under the  
17           BV Lake Agreement, the order of use of BV Lake is that Buena Vista’s share of storage at  
18           Isabella must first be fully utilized, then BV Lake Cell 2 is utilized, and only thereafter is Cell 1  
19           to be utilized. (BV Lake Agreement ¶8.) Pursuant to the BV Lake Agreement, Buena Vista  
20           *abandoned* any claim to store any water in BV Lake Cell 3 (located south of Cells 1 and 2).  
21           (BV Lake Agreement ¶11; emphasis added).

22           **C.     The Shaw Decree**

23           26.     On August 6, 1900, certain individual appropriative water rights of the First Point  
24           diverters were adjudicated by Judge Lucien Shaw of the Kern County Superior Court. The  
25           resulting Shaw Decree established the quantities available for diversion and appropriation among  
26           diverters at First Point.

27           27.     The Shaw Decree provides that when there is not sufficient water available to  
28           satisfy all of the rights of the First Point diverters, the order of priority stated in the Shaw Decree  
29           shall be followed. Since 1900, the individual appropriative rights of the First Point diverters have  
30           been administered according to the rights and priorities stated in the Shaw Decree.

///  
1565993.6

1           28.     Kern River Flow and Diversion Records—daily records of the diversion of Kern  
2 River water at First Point which have been kept since 1894—presently lists twenty-six diversion  
3 rights and a total instantaneous flow of 3,162.5 cubic-feet per second. First Point rights are  
4 satisfied when the river is running over 3,162 cfs at First Point, and any flow over that amount is  
5 released to Second Point.

6     **D.     Lower River Rights**

7           29.     Before the development of Isabella Dam in 1953, during times of high flow Kern  
8 River water was available for diversion far downstream of Second Point (e.g. north of Highway  
9 46) in the Tulare Lake basin. As recognized in Water Rights Decision 1196, landowners in that  
10 area diverted and used this high-flow water for beneficial purposes. These “Lower River Rights”  
11 were also recognized and accounted for in the 1962 Kern River Water Rights and Storage  
12 Agreement, which was an agreement among First Point diverters, Second Point diverters and  
13 Lower-River diverters entered that apportioned storage in Lake Isabella. Under that agreement,  
14 Lower River Rights were measured as various percentages of calculated natural flow at First  
15 Point, as well as all water that passed north of Highway 46.

16           30.     The Authority is informed and believes and thereon alleges that Hacienda Water  
17 District and the Tulare Lake Basin Water Storage District historically were the major entities  
18 diverting under the Lower River Rights. The Authority is informed and believes and thereon  
19 alleges that, in 2001, the Kern County Water Agency purchased the Lower River Rights, and they  
20 today are held and exercised by the Kern County Water Agency by diversion at First Point.  
21 Notwithstanding all rights on the Kern River, including the Lower River rights, water has still  
22 historically entered into the California Aqueduct through the Intertie during high flow periods on  
23 the Kern River.

24     **E.     Kern River Mandatory Release**

25           31.     Since approximately 1986, the Kern River Watermaster has implemented a “*Policy*  
26 *of the Parties to 1962 Kern River Water Rights and Storage Agreement Re-Utilization of Isabella*  
27 *Reservoir Flood Releases*” (hereinafter “Flood Policy”). The Authority is informed and believes  
28 and thereon alleges that the Flood Policy was put in place for the principal purpose of accounting



1 for Kern River flows in excess of rights on the river. The Flood Policy generally provides that  
 2 when certain conditions are met, anyone may divert the excess Kern River water. Specifically,  
 3 when (1) abnormal flow is being released from Isabella Reservoir by order of the Corps of  
 4 Engineers (also called "mandatory release conditions"), and (2) such flow is entering into the  
 5 California Aqueduct through the Intertie:

6 [w]ater will be made available to any person, interest or group in  
 7 Kern County who wish to divert that water, up to the amount of  
 8 water flowing into the Intertie, provided such interest, person or  
 9 group acknowledges their desire to divert said water by executing  
 10 an "Order" which shall include, among other things, a description  
 of the point they wish to divert such flow, the rate of flow they  
 wish to divert and provide a schedule such that the request may be  
 honored by the operating Kern River entity. This policy is without  
 prejudice to the rights of any of the Parties.

11 *(Policy of the Parties to 1962 Kern River Water Rights and Storage Agreement Re-*  
 12 *Utilization of Isabella Reservoir Flood Releases.)*

13 32. Historically, various parties including the Authority have diverted and used surplus  
 14 Kern River water when mandatory release conditions were in effect.

15 **F. The Scope of Buena Vista's Pre-1914 Appropriative Water Rights**

16 33. Buena Vista has recently asserted, purportedly based on the 1888 Miller-Haggin  
 17 Agreement, that it holds the right to all water that reaches Second Point of Measurement.  
 18 Specifically, Buena Vista has asserted that it holds pre-1914 appropriative water rights as  
 19 reported to the Water Board in Statement of Diversion and Use Numbers S004666, S015611,  
 20 S015612, S015613, and S015614. For each of the referenced Statements, Buena Vista has  
 21 asserted that its rights are pre-1914 appropriative rights and that diversions commenced in the  
 22 year 1870.

23 34. The scope of a pre-1914 water right equals the amount of water actually  
 24 appropriated for a beneficial use within a reasonable period of time. (*De Necochea v. Curtis*  
 25 (1889) 80 Cal. 397, 402.) Title to the right vests when the appropriator actually applied the full  
 26 amount of the diverted water to a beneficial use, and the priority date is established as of the date  
 27 the appropriation commenced. (*Maeris v. Bickness* (1857) 7 Cal. 261, 263.) The initiation of an  
 28 appropriation is demonstrated by some overt act that made it clear that an appropriation of water



1 was intended, such as posting a notice at the proposed point of diversion, conducting surveys, or  
2 construction of project works.

3 35. A pre-1914 appropriative right may be initiated and then prosecuted with diligence  
4 for a reasonable time according to a pre-determined plan of development. In circumstances  
5 where a pre-1914 appropriative right is initiated and prosecuted with diligence for a reasonable  
6 time according to a pre-determined plan of development, the initial priority date may attach to the  
7 entire water supply developed. (*But see, e.g., Haight v. Costanich* (1920) 184 Cal. 426, 432;  
8 *Senior v. Anderson, supra*, 115 Cal. 496 [holding that right holder could not continue expanding  
9 right by bringing additional lands under cultivation after expiration of reasonable time]; *see also*  
10 Water Code § 1202(b) and State Water Board Order WR 2006–0001 at 8-9.) After a right is fully  
11 developed, however, the diversion of additional water would require the initiation of a new right  
12 with a junior appropriation date. (*See, e.g., Butte Canal & Ditch Co. v. Vaughn* (1858) 11 Cal.  
13 143, 152-54.)

14 36. Based on the historical use of Kern River water by Buena Vista and its  
15 predecessor, Miller & Lux, Buena Vista’s pre-1914 appropriative water right to the Kern River is  
16 no more than that which can be reasonably and beneficially used on approximately 50,000 acres  
17 of land. Neither Buena Vista nor its predecessor, Miller & Lux, had a pre-determined plan of  
18 development that contemplated diversions of Kern River water in the quantities recently made by  
19 Buena Vista. The annual volumetric quantity and other parameters of Buena Vista’s pre-1914  
20 appropriative right to the Kern River will be adjudicated in this proceeding based on evidence to  
21 be presented at the adjudicatory hearing on this Complaint.

22 **G. Buena Vista has Diverted in Excess of its Pre-1914 Appropriative Water Rights.**

23 37. Notwithstanding the limited scope of Buena Vista’s pre-1914 appropriative water  
24 rights, Buena Vista has, in recent years, diverted quantities of water far in excess of historical  
25 diversions. As reported by Buena Vista in its annual Supplemental Statements of Diversion and  
26 Use for Statement Numbers S004666, S015611, S015612, S015613, and S015614, Buena Vista  
27 has diverted up to 563,384 AF annually, hundreds of thousands of acre-feet in excess of its right.

28 Buena Vista’s historical diversions, as reported to the Water Board, have been as follows:

1565993.6

10

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

Buena Vista Water Storage District						
Supplemental Statement of Water Diversion and Use Summary (acre-feet)						
Statement of Diversion and Use	S004666 <sup>(a)</sup>	S015611 <sup>(b)</sup>	S015612 <sup>(c)</sup>	S015613 <sup>(d)</sup>	S015614 <sup>(e)</sup>	Total Use Reported from Statements of Water Diversion and Use
1984	87,000					87,000
1985	63,800					63,800
1986	191,500					191,500
1987	18,400					18,400
1988	9,200	No Data	No Data	No Data	No Data	9,200
1989	8,800					8,800
1990	6,200					6,200
1991	61,600					61,600
1992	20,500					20,500
1993		800	-	26,200	0	27,000
1994		0	-	33,900	0	33,900
1995		12,500	-	91,400	8,300	112,200
1996		4,000	-	43,400	0	47,400
1997		1,400	-	120,700	12,800	134,900
1998		1,500	-	133,700	65,000	200,200
1999	No Data	0	-	12,300	0	12,300
2000		0	-	15,700	0	15,700
2001		2,400	-	33,100	0	35,500
2002		3,600	-	8,600	0	12,200
2003		800	-	17,400	0	18,200
2004		0	-	21,200	0	21,200
2005	0		70,871	--	0	70,871
2006	4,439	No Data	88,859	--	28,297	121,595
2007	866		21,182	--	0	22,048
2008	8,223	18,517	46,090	0	0	72,830
2009	40,056	21,442	2,799	3,000	0	67,297
2010	13,529	56,904	59,428	25,185	0	155,046
2011	12,461	193,732	96,911	53,156	19,321	375,581
2012	8,212	25,343	12,650	0	0	46,205
2013	38	21,384	1,018	0	0	22,440
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	20,848	615	0	0	21,463
2017	16,080	296,757	117,685	74,916	57,946	563,384

- 1 (a) Supplemental Statement of Diversion and Use S004666 reports use at the Main Canal Intake, Alejandro Canal Intake and Kern River Outlet (Waste) Weir and flow at Second Point of Measurement. No reports are on file for 1993 through 2004 and locations are reported on S015611, S015612, S015613 and S015614. Starting in 2005, S004666 reports use at the Kern Water Bank Intake. Flow at Second Point of Measurement for 1984 through 1992 is not included in the table, since it is a measurement location, not a diversion location.
- 2
- 3 (b) Reporting for Supplemental Statement of Diversion and Use S015611 starts in 1993. No reports are available for 2005 through 2007.
- 4 (c) Reporting for Supplemental Statement of Diversion and Use S015612 starts in 1993. The location is listed as Second Point of Measurement for 1993 through 2004, a measurement location not a diversion location, so these values are excluded from this table. After 2004 the reporting methodology changed, and it is not clear what location is being reported.
- 5 (d) Reporting for Supplemental Statement of Diversion and Use S015613 starts in 1993. Reports for 2004, 2005 and 2006 list the diversion location as Second Point of Measurement, a measurement location, not a diversion location, so these values are excluded from the table. After 2006, the reporting methodology changed, and it is not clear what location is being reported.
- 6 (e) Reporting for Supplemental Statement of Diversion and Use S015614 starts in 1993.
- 7

8 **H. Buena Vista’s Use and Method of Diversion of Kern River Water in the 2016-2017**  
 9 **Water Year Constituted Waste and Unreasonable Use of Water.**

10 38. In the 2016-2017 water year—before Governor Brown declared an end to  
 11 California’s recent drought emergency—Buena Vista utilized Buena Vista Lake to cause the  
 12 waste and unreasonable use of water. During this time, the Authority is informed and believes,  
 13 and thereon alleges, that Buena Vista diverted approximately 40,000 AF water into Cells 1, 2, and  
 14 3 in Buena Vista Lake. A substantial portion of this water ultimately evaporated and was not  
 15 utilized for any beneficial purpose. The Authority is informed and believes and thereon alleges  
 16 that Buena Vista did not report these diversions to storage to the State Water Board.

17 39. The Authority is informed and believes thereon alleges that Buena Vista diverted  
 18 and wasted Kern River water, as alleged in paragraph 38 of this Complaint, for the principal  
 19 purpose of avoiding mandatory release conditions on the Kern River under the Flood Policy,  
 20 which would have allowed others (including the Authority) to divert and use Kern River water.  
 21 Further, the Authority is informed and believes and thereon alleges that Buena Vista diverted and  
 22 wasted this water for the purpose of preventing its beneficial use by others on the Kern River.

23 **FIRST CAUSE OF ACTION**

24 **(Unauthorized Diversion of Water)**

25 40. The Authority incorporates by reference the allegations in paragraphs 1 through 39  
 26 above as though fully set forth herein.

27 ///

28 ///

1 41. Buena Vista's diversion and use of Kern River water in excess of its pre-1914  
 2 appropriative rights is not authorized under any valid water right held by Buena Vista and  
 3 therefore violates Cal. Water Code section 1052 and other applicable law.

4 42. The Authority is informed and believes thereon alleges that unless it is ordered by  
 5 the State Water Board to cease doing so, Buena Vista will continue to claim and divert the full  
 6 flow of the Kern River that reaches Second Point of Measurement.

7 **SECOND CAUSE OF ACTION**

8 **(Violation of California Constitution, Article X, section 2 and Water Code Section 100)**

9 43. The Authority incorporates by reference the allegations in paragraphs 1 through 42  
 10 above as though fully set forth herein.

11 44. The California Constitution and the Water Code require that "water resources of  
 12 the State be put to beneficial use to the fullest extent of which they are capable, and that the waste  
 13 or unreasonable use or unreasonable method of use of water be prevented." (Cal. Constitution,  
 14 Art. X, § 2; Water Code § 100.) The California Constitution and the Water Code further prohibit  
 15 "waste or unreasonable use or unreasonable method of use or unreasonable method of diversion  
 16 of water." (*Id.*)

17 45. The Authority is informed and believes and thereon alleges that Buena Vista's  
 18 diversion of water into Buena Vista Lake during the 2016-2017 water year, the subsequent  
 19 evaporation of a substantial portion of that water, and Buena Vista's failure to put the water to  
 20 any beneficial use constitute an unreasonable and wasteful use and method of diversion of water  
 21 in violation of Article X, section 2 of the California Constitution and Section 100 of the Water  
 22 Code.

23 46. As a direct and proximate result of Buena Vista's unreasonable use and waste of  
 24 water and unreasonable method of diversion, the Authority has incurred and will incur harm to its  
 25 rights and interests.

26 47. The Authority is informed and believes and thereon alleges that Buena Vista's  
 27 actions in unreasonably using and wasting water, and its unreasonable method of diversion,  
 28 described above were willful, wanton and malicious in that Buena Vista intended to cause the



1 waste of water for the purpose of preventing mandatory release conditions on the River under the  
2 Flood Policy and the diversion of that water by other persons including the Authority on the Kern  
3 River.

4 48. The Authority has an inadequate remedy at law for the harm Buena Vista’s  
5 unauthorized diversions and taking of water have caused. Unless ordered by the State Water  
6 Board to cease and desist, the Authority is informed and believes and thereon alleges that Buena  
7 Vista will continue the unauthorized diversion and taking of water and cause irreparable injury to  
8 the Authority and other water users by, among other things, impairing and continuing to impair  
9 the ability of the Authority and other water users to divert and use water from the Kern River.

10 **THIRD CAUSE OF ACTION**

11 **(Forfeiture of Pre-1914 Appropriative Water Rights)**

12 49. The Authority incorporates by reference the allegations in paragraphs 1 through 48  
13 above as though fully set forth herein.

14 50. Buena Vista has alleged that it holds a right to divert all Kern River water that  
15 reaches Second Point of Measurement. Although the Authority is not aware of any right that  
16 entitles Buena Vista to divert and use Kern River water in excess of that which can be reasonably  
17 and beneficially used on approximately 50,000 acres, the Authority alleges that to the extent that  
18 such right may have existed in the past, Buena Vista has forfeited a substantial portion of such  
19 rights due to non-use.

20 51. The Authority’s Application No. 31676, which was filed with the State Water  
21 Board on or about September 26, 2007, constitutes a competing claim for Kern River water  
22 diverted by Buena Vista including but not limited to that reported under Statement Nos. S004666,  
23 S015611, S015613, and S015614.

24 52. Buena Vista did not divert any water from the Kern River in excess of that which  
25 can be reasonably and beneficially used on approximately 50,000 acres at any point in the five  
26 years prior to September 26, 2007, thereby forfeiting any claim to divert water in excess of that  
27 which can be reasonably and beneficially used on approximately 50,000 acres.

28 ///  
1565993.6



1 claimed right to Kern River water in excess of that which can be reasonably and beneficially used  
2 on approximately 50,000 acres.

3 58. Pursuant to the BV Lake Agreement, Buena Vista, on October 14, 1964,  
4 abandoned any claim to store any water in BV Lake Cell 3. Buena Vista's act of abandoning  
5 Cell 3's storage capacity further demonstrates Buena Vista's intent to relinquish possession and  
6 enjoyment of its claimed right to Kern River water in excess of that which can be reasonably and  
7 beneficially used on approximately 50,000 acres.

8 59. The Authority is informed and believes and thereon alleges that without a  
9 determination by the State Water Board that Buena Vista has abandoned any claimed rights to all  
10 water from the Kern River in excess of that which can be reasonably and beneficially used on  
11 approximately 50,000 acres, Buena Vista intends to continue to claim and divert the full flow of  
12 Kern River water that reaches Second Point.

13 **PRAYER FOR RELIEF**

14 WHEREFORE, the Authority respectfully requests that the State Water Board:

- 15 1. Notice and conduct an adjudicatory hearing regarding the allegations of this  
16 Complaint in accordance with applicable law;
- 17 2. Find and determine that Buena Vista's pre-1914 appropriative water right is  
18 limited to the total quantity that can be reasonably and beneficially used on approximately 50,000  
19 acres of land, the precise quantity of the right to be determined based on evidence to be presented  
20 at an adjudicatory hearing on this Complaint;
- 21 3. Find and determine that Buena Vista has partially forfeited its pre-1914  
22 appropriative water right, the precise quantity of the right to be determined based on evidence to  
23 be presented at an adjudicatory hearing on this Complaint;
- 24 4. Find and determine that Buena Vista has partially abandoned its pre-1914  
25 appropriative water right, the precise quantity of the right to be determined based on evidence to  
26 be presented at an adjudicatory hearing on this Complaint;
- 27 5. Find and determine that Buena Vista has unlawfully diverted and used water from  
28 the Kern River in violation of applicable law;

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

6. Find and determine that Buena Vista has violated Article X, section 2 of the California Constitution and Cal. Water Code section 100 by using and employing methods of diversion of Kern River water that are wasteful and unreasonable as alleged herein;

7. Issue a cease and desist order barring Buena Vista from (i) diverting Kern River water in excess of its rights; and (ii) engaging in the wasteful or unreasonable use or methods of diversion of Kern River water.

8. Award the Authority such other relief as the State Water Board deems just and proper.

DATED: August 8, 2019

DOWNEY BRAND LLP

By:

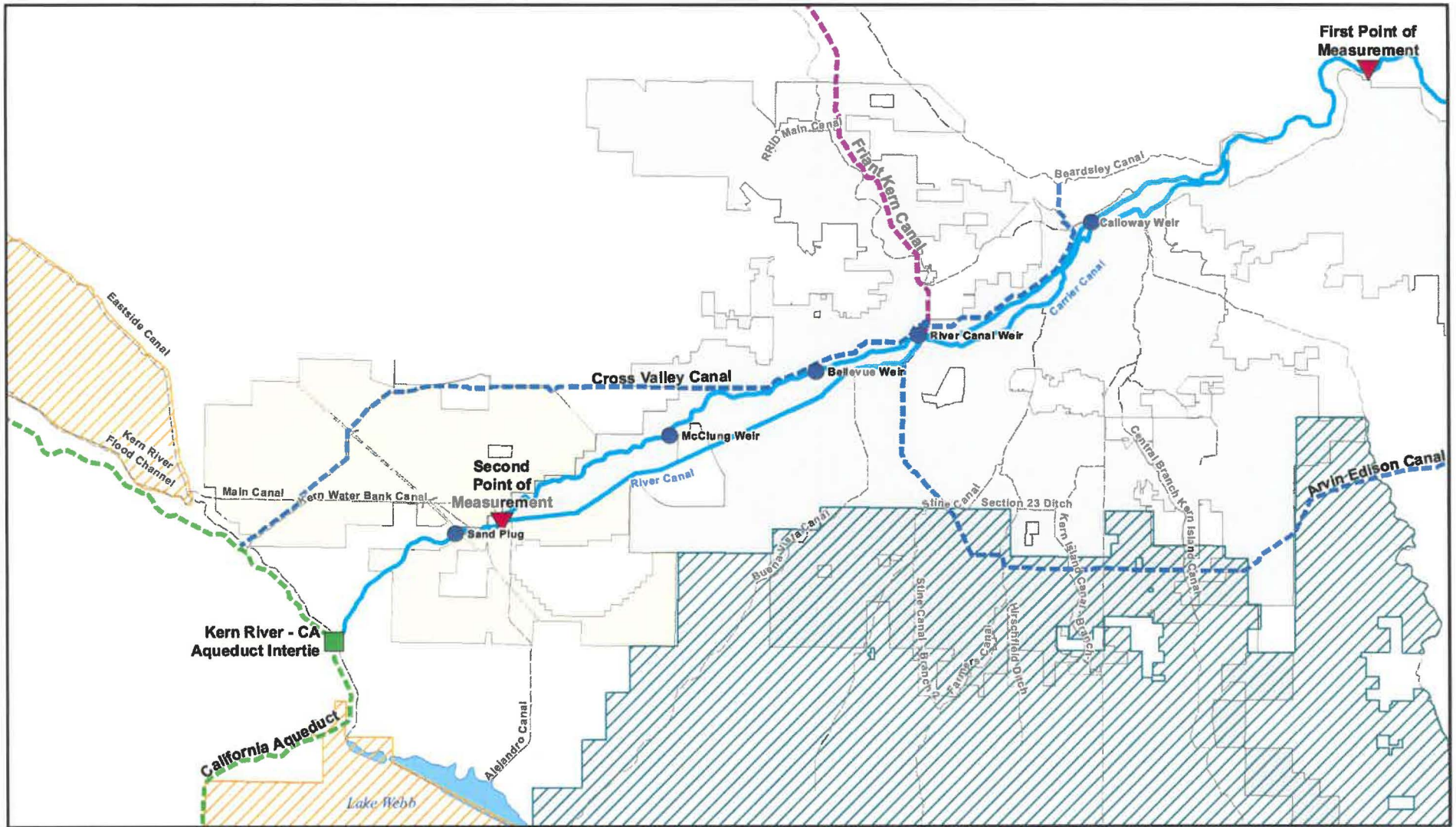


KEVIN M. O'BRIEN

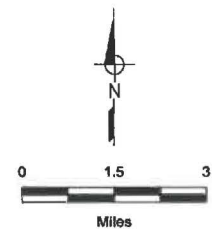
*Attorneys for Complainant,*  
KERN WATER BANK AUTHORITY



# **EXHIBIT A**



- Kern River - California Aqueduct Intertie
- Kern Water Bank
- Buena Vista Water Storage District
- Kern Delta Water District
- City of Bakersfield
- Kern River Facilities
- Point of Measurement
- River Weir
- Federal Canal
- Local Canal
- Local Distribution Canal



**Exhibit A**  
**Kern River**  
**Key Facilities**



# State Water Resources Control Board



Alan C. Lloyd, Ph.D.  
Agency Secretary

Division of Water Rights  
1001 I Street, 14<sup>th</sup> Floor ♦ Sacramento, California 95814 ♦ 916.341.5300  
Mailing Address: P.O. Box 2000 ♦ Sacramento, California 95812-2000  
FAX: 916.341.5400 ♦ www.waterrights.ca.gov

Arnold Schwarzenegger  
Governor

APPLICATION NO. \_\_\_\_\_  
(Leave blank)

## UNDERGROUND STORAGE SUPPLEMENT to APPLICATION TO APPROPRIATE WATER BY PERMIT

1. State amount of water to be diverted to underground storage from each point of diversion in item 3b of form APP.

- a. Maximum Rate of diversions (1) \_\_\_\_\_ (2) 650 (3) 150 cfs
- b. Maximum Annual Amount (1) \_\_\_\_\_ (2) 360,0000 (3) 50,000 acre-feet

2. Describe any works used to divert to offstream spreading grounds or injection wells not identified in item 7 of form APP.

N/A  
\_\_\_\_\_

3. Describe spreading grounds and identify its location and number of acres or location of upstream and downstream limits if onstream.

See Maps 2 and 3. The Kern Fan Projects (POD #2) available to Buena Vista are approximately 30,000 in gross acres with more than 10,000 acres of recharge ponds. POD#3 to the Buena Vista service areas offer more than 50 miles of canals and sloughs.  
\_\_\_\_\_

4. State depth of groundwater table in spreading grounds or immediate vicinity:  
91 feet below ground surface in September 2006 measured at a point located within the NW ¼ of NE ¼ of Section 23, T 30 S, R 24 E, MD B&M

5. Give any historic maximum and or minimum depths to the groundwater table in the area.

Location 30/24/23B Maximum 155 feet below ground surface on 12/04 (date)  
Location 31/26/29L Maximum 199 feet below ground surface on 6/03 (date)

6. Describe proposed spreading operation. Whenever water is available in excess of demands or available surface storage then water is diverted into spreading areas for underground storage for later extraction.  
\_\_\_\_\_

7. Describe location, capacity and features of proposed pretreatment facilities and/or injected wells.  
N/A  
\_\_\_\_\_

8. Reference any available engineering reports, studies, or data on the aquifer involved.

USGS, Water Supply Paper 1618, Use of Ground-Water Reservoirs for Storage of Surface Water in the San Joaquin Valley, CA 1964.

USGS, Water Supply Paper 1469, Groundwater Conditions and Storage Capacity in the San Joaquin Valley, CA 1959.

USGS, Water Supply Paper 1999-H, Subsurface Geology of the Late Tertiary and Quaternary Water-Bearing Deposits of the Southern Part of the San Joaquin Valley, CA 1972.

USGS, Hydrologic Investigations Atlas HA-489, Base of Fresh Ground Water in the San Joaquin Valley, California, 1972.

USGS, Professional Paper 1401-C, Geology of the Fresh-Water Basin of the Central Valley, California, with Texture Maps and Sections, 1986.

Crewdson, Robert A., 15 November, 2004, An Evaluation of Representative Hydrologic Periods for Basin and District Water Balances for the Kern County Water Agency, Sierra Scientific Services, Bakersfield, Ca.

Crewdson, Robert A., Fall 2007, A Baseline Water Quality Evaluation of the Kern Fan Groundwater Aquifer for the Rosedale - Rio Bravo Water Storage District, Sierra Scientific Services, Bakersfield, Ca.

Crewdson, Robert A., Fall 2007, An Evaluation of the State of the Basin for the Kern County, Ca Portion of the Southern San Joaquin Valley, for the Buena Vista- and Rosedale - Rio Bravo Water Storage Districts, Sierra Scientific Services, Bakersfield, Ca.

Croft, M.G., 1972, Subsurface geology of the Late Tertiary and Quaternary water-bearing deposits of the southern part of the San Joaquin Valley, California, USGS WSP 1999H, 29p.

Dale, R.H., J.J. French, H.D. Wilson, Jr., 1964, The story of ground water in the San Joaquin Valley, California, USGS Circ. 459.

Dale, R.H., J.J. French, G.V. Gordon, 1966, Ground-water geology and hydrology of the Kern River alluvial fan area, California, USGS WRD OF Report.

Fryer, Lloyd, August 27, 2001, Kern County Water Agency Initial Water Management Plan, Public Review Draft, KCWA, Bakersfield, Ca.

Frink, J.W., H.A. Kues, 1954, Corcoran clay - A Pleistocene lacustrine deposit in the San Joaquin Valley, California, AAPG Bull. v. 38, pp. 2357 - 2371.

Manning, J.C., 1967, Report on ground water hydrology in the southern San Joaquin Valley, AWWA Jour v. 59, pp. 1513 - 1526.

Negrini, Robert, M., 2001, May 12, 2005, Kern Water Bank Authority and California State University, Bakersfield 3-D Characterization and Monitoring of Aquifer Attributes in the Kern Water Bank, Local Groundwater Assistance Act of 2000 Final Report, CSUB.

Negrini, R., Baron, Gillespie, Horton, Blake, Huff, Meyer, Powers, Draucker, A., Draucker, S., Durham, Hilton, Mondrian, O'Rear, Philley, Register, 2005, A middle Pleistocene lacustrine delta lobe in the Kern River alluvial fan and its close association with groundwater arsenic concentrations: One outcome of USDA-CREES Grant #2001-01170, USDA-CREES National Water Quality Conference, La Jolla, Ca, Feb.

Shelton, Jennifer, L., Pimentel, Fram, and Belitz, 2006, Ground-Water Quality Data in the Kern Basin, California, 2006: Results from the California GAMA Program, Preliminary USGS-Water Resources Data Report CA-XXXX, subject to revision, USGS.

Spear, Michael, J., 2003, California's Groundwater, Bulletin 118 - Update 2003, California Department of Water Resources (pp. 175 - 182).

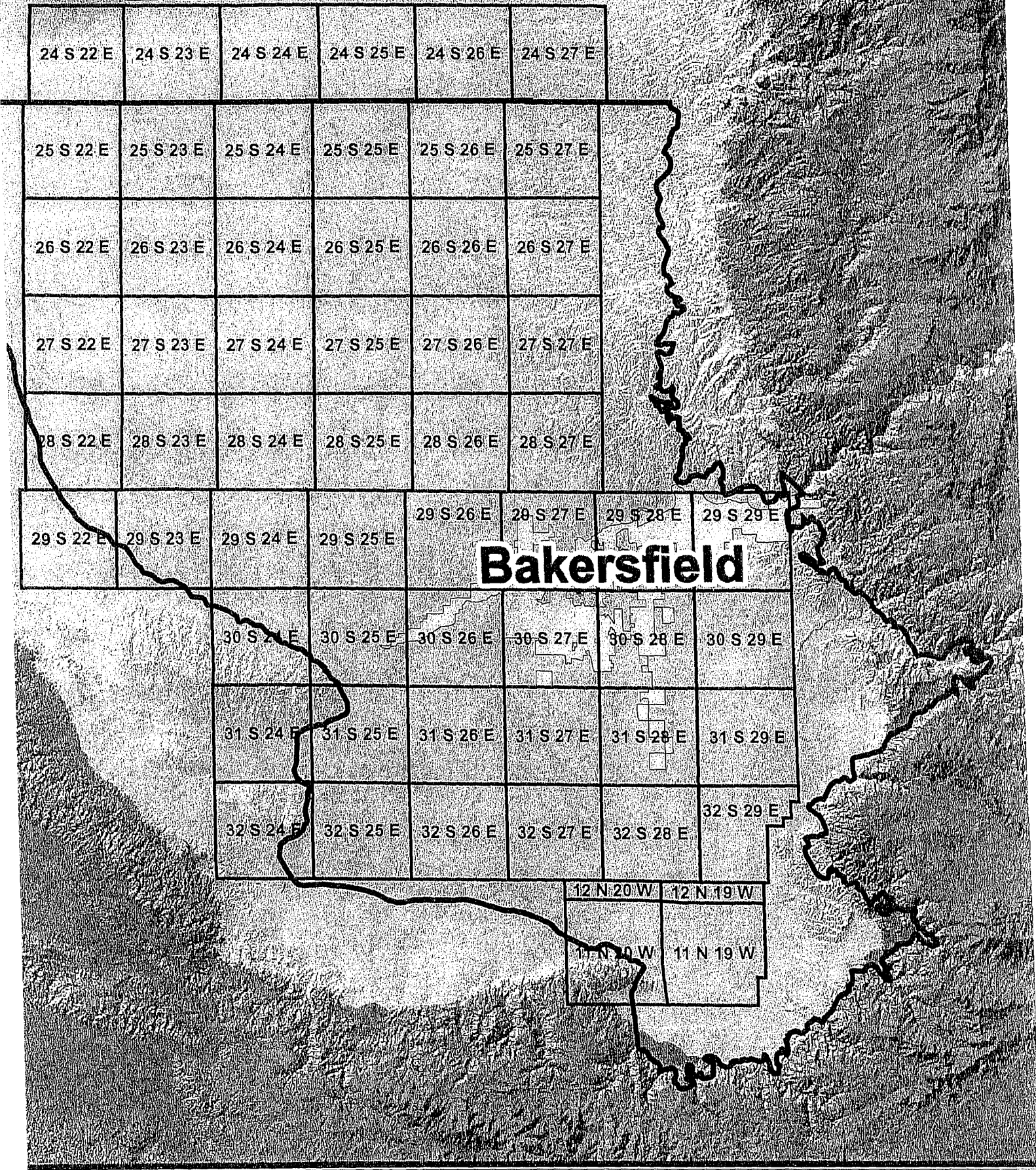
Swartz, R.J., 1995, A study of the occurrence of arsenic on the Kern Fan element of the Kern Water Bank, southern San Joaquin Valley, Ca., MSC thesis, CSUB, 138p.

9. Describe underground reservoir and attach a map or sketch of its location. The reservoir area of interest underlies approximately 20 townships (approx. 720 sq. mi or approx. 461,000 ac) within Kern County, Ca. The entire area is underlain by a 500- to 1000-ft thick, semi-confined aquifer comprised of medium- to coarse-grained fluvial/alluvial sediments deposited by the Kern River within the southern San Joaquin Valley within the last million years. The aquifer is a prolific water producer with excellent storage and transmissive properties. The native groundwater is good quality potable water derived from approximately 740,000 af/yr recharge from the Kern River which drains the southern Sierra Nevada mountain range to the east of Bakersfield, Ca.
10. State estimated storage capacity of underground reservoir. Based on measurements and analyses reported by R. A. Crewdson, January, 2003, the storage capacity of the area of interest exceeds 10 million af, assuming the following parameters: average depth to water of 150 ft over an area of 461,000 acres, with an average dewatered-aquifer storage capacity of 0.15 .
11. Describe existing use of the underground storage reservoir and any proposed change in its use. Currently the underground storage is used to store and recover Federal (CVP and Friant-Kern), State, and Kern River water for a wide variety of beneficial purposes.
12. Describe the proposed method and location of measurement of water placed into and withdrawn from underground storage. Since Buena Vista already operates and maintains a conjunctive use system it is well equipped with required infrastructure and staff. Relative to recovery, meters are placed on the well discharges and recorded regularly. Deliveries into the District service areas and recharge are measured by a wide variety of continuous recording measuring devices based on the application of the facility. Buena Vista's Hydrographer maintains Buena Vista records and acts as the Kern River Watermaster at 2<sup>nd</sup> Point diverting and recording all rights downstream of 2<sup>nd</sup> Point.

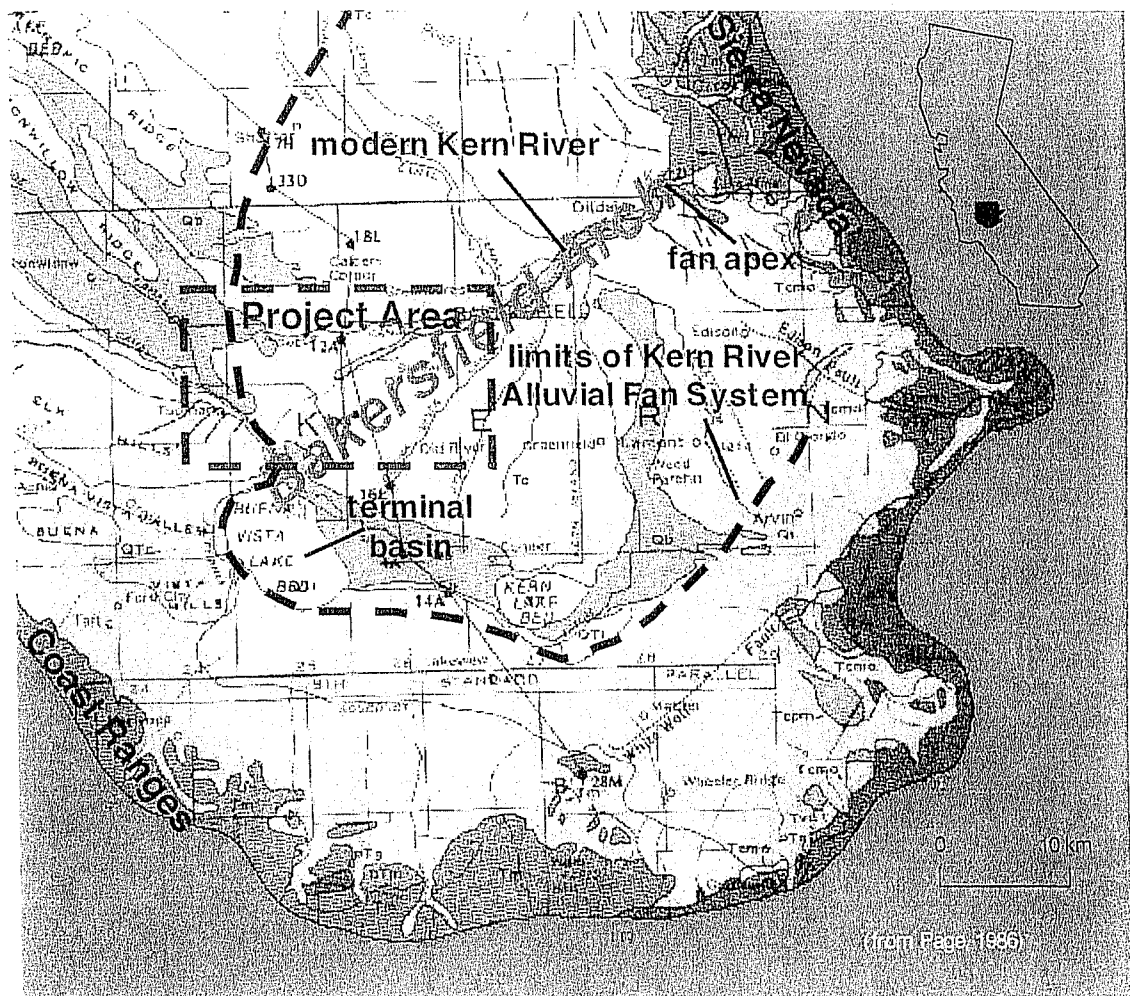
Additional copies of this form and water right information can be obtained at [www.waterrights.ca.gov](http://www.waterrights.ca.gov).



# STATE OF THE BASIN STUDY AREA



M-4



- Q<sub>Tc</sub> Quaternary alluvium
- Q<sub>lc</sub> Quaternary lacustrine clays
- Q<sub>f</sub> Quaternary fluvial (stream) deposits
- T<sub>m</sub> Tertiary marine deposits

Figure S1. Location Map of Project Area and surrounding features discussed in the text. Bakersfield Arch is a broad, low-amplitude structural upwarp that has been active throughout most of the Tertiary Period (past 60-70 Myr).

Map 5

# Environmental Defense Sciences

---

202 S. Lake Ave., Ste. 294, Pasadena, CA 91101 Tel: 626-744-1766 Fax: 626-304-9427

## TECHNICAL MEMORANDUM

**Date:** January 14, 2021

**To:** Jonathan Parker  
Kern Water Bank Authority

**From:** E. John List, Ph.D., P.E.  
Principal Consultant

**Subject :** Draft Environmental Impact Report for the Palms  
Groundwater Recovery Project  
State Clearinghouse Number 2020060315  
FSI E217003



This memorandum will present the results of my review of the subject DEIR for the Palms Groundwater Recovery Project proposed by Buena Vista Water Storage District (BVWSD). The memorandum is in two parts: Part I presents my analysis of perceived deficiencies in the DEIR; Part II describes what in my professional opinion are problems with the proposed project as described and evaluated in the DEIR. I discuss the additional information and analysis that should be developed in order for the DEIR to inform the public of the water quality effects of the project.

### **Part I - Deficiencies in the DEIR Regarding Water Quality**

The primary problem with the project description in the DEIR is that there is a paucity of data describing in detail the water quality issues that will be associated with the project. It is clear that the groundwater quality on the western side of the East Side Canal differs significantly from that on the east of the Canal, and this is acknowledged in the DEIR in general terms. However, the DEIR does not include any of the detailed, but still somewhat limited, presentation of data available in the GEI 2017 memorandum:

GEI Consultants, Inc. 2017. Memorandum: Water Quality Review of Groundwater Wells for "The Palms" Recovery Project, to Buena Vista Water Storage District, February 17.

This document describes significant problems with water quality, including arsenic, nitrate hardness, gross alpha activity and high levels of iron and manganese and concluded that:

"Iron and manganese are issues in a majority of the BVWSD wells. All sample results for well 23B are extremely high: average iron is 14,082 ppb and manganese is 2,610 ppb. Since the sample results are consistently high, this data is considered representative of the aquifer. With the levels this high, it is unlikely that blending will provide adequate contaminant reduction and therefore will not be an acceptable treatment method."

The DEIR not only provides no discussion of these potential problems for the project, but on page 3-84 goes so far as to state:

---



“Overall, the water quality of the well locations in the Recovery Project area meets drinking water standards. However, monitoring wells that represent the shallow aquifer, generally less than 300 feet below ground surface (bgs) and the deeper aquifer, generally greater than 500 feet bgs show some constituents with exceedances. Constituents in the shallow and deeper aquifers tend to exceed chloride, conductivity, total dissolved solids, and sulfate. Table 3-8 presents the water quality constituents that were evaluated. These constituents either had noticeable detections or are part of the DWR’s constituents of concern for non-SWP water that is pumped into the Aqueduct.”

**Table 3-8. Water Quality Constituents Evaluated**

Antimony	Iron
Arsenic	Manganese
Boron	Nitrate
Bromide	Sodium
Chloride	Sulfate
Conductivity	Total Dissolved Solids
Gross Alpha	Total Organic Carbon
Hardness	Uranium

“To further evaluate the potential impacts of the Recovery Project water when it enters the Aqueduct, the average theoretical blend values were compared against the average values observed in the Aqueduct near the Recovery Project Area. Table 3-10 depicts the comparison between the two types of water. It is anticipated that the following mitigation measures identified will reduce these constituents that exceed the quality of the Aqueduct.”

Table 3-10 was apparently derived from Table 3-5, which purports to describe the SWP Aqueduct water quality upstream and downstream of the project. The data in Table 3-5 are clearly incorrect. It simply would not be possible to reduce the arsenic, chloride, sodium, sulfate and TDS concentrations in the Aqueduct water between the upstream and downstream measurement locations. It is likely that it is the upstream measurements in the table that are incorrect, but it is not clear. The data from Table 3-5 are transcribed into Table 3-10, so that the upstream data in Table 3-10 are also incorrect.

A further problem with the data in Table 3-10 is that the “Project Water” projection is based upon a blend of waters from west and east of the East Side Canal with the west side waters represented by a single well in the west, as is discussed further below.

**Table 3-5. Summary of Aqueduct Water Quality Upstream and Downstream of Project Area**

Constituent	Drinking Water Standard	Upstream		Downstream	
		Average	Max	Average	Max
Antimony (ppb)	MCL = 6	0		0	
Arsenic (ppb)	MCL = 10	14	18	3.5	11
Boron (ppm)	NL = 1	0.1		0.2	0.4
Bromide (ppm)	N/A	No data		No data	
Chloride (ppm)	SMCL = 250	120	131	70	127
Conductivity ( $\mu$ S/cm)	SMCL = 900	736	758	465	740
Gross Alpha (pCi/L)	MCL = 15	No data		No data	
Hardness (ppm)	Very Hard > 181	74.5	77	107	141
Iron (ppb)	SMCL = 300	3	6	17	63
Manganese (ppb)	SMCL = 50	0		2	220*
Nitrate as N (ppm)	MCL = 10	1.3	1.4	2.6	5.3
Sodium (ppm)	DWR = 200	106	112	53	97
Sulfate (ppm)	SMCL = 250	96	103	40	121
Total Dissolved Solids (ppm)	SMCL = 500	416	436	263	434
Total Organic Carbon (ppm)	N/A	No data		No data	
Uranium (pCi/L)	MCL = 20	No data		No data	

\*Indicates that result is over the drinking water standard

\* parts per billion

**Table 3-10. Comparison of Average Project Water and Aqueduct Water Quality**

Constituent	Aqueduct Upstream	Project Water	Aqueduct Downstream
Antimony (ppb)	0	0.4	0
Arsenic (ppb)	14	1.5	3.5
Boron (ppm)	0.1	0.1	0.2
Bromide (ppm)	No data	0.75	No data
Chloride (ppm)	120	65	70
Conductivity ( $\mu$ S/cm)	736	905	465
Gross Alpha (pCi/L)	No data	6.2	No data
Hardness (ppm)	74.5	209	107
Iron (ppb)	3	63	17
Manganese (ppb)	0	28	2
Nitrate as N (ppm)	1.3	2.6	2.6
Sodium (ppm)	106	103	53
Sulfate (ppm)	96	281	40
Total Dissolved Solids (ppm)	416	613	263
Uranium (pCi/L)	No data	8.5	No data

Presuming that it is the downstream numbers in Table 3-10 that are correct it is difficult to see how the levels of iron, manganese, sulfate and total dissolved solids can be reduced by blending to meet a non-degradation standard for pumping into the Aqueduct. The required blend water would have to be of an even higher quality. i.e., lower concentrations, than the Aqueduct water. The only water seemingly available to accomplish the blending goals is the Kern River water (see Table 3-3 and the discussion in Part II below).

**Table 3-3. Water Quality in the Kern River**

Constituent	MCL	Minimum	Average	Maximum	Units
Chloride <sup>2</sup>	250	2.2	6.4	10	mg/L
Sodium <sup>2</sup>		4.5	15	30	mg/L
TDS <sup>3</sup>	500	40	129	227	mg/L
Arsenic <sup>2</sup>	10	ND	ND	ND	ug/L
Nitrate (as NO <sub>3</sub> ) <sup>3</sup>	45	ND	0.7	1.8	mg/L

<sup>2</sup> Source RWQCB 2015<sup>3</sup> Source: Kern County Water Agency Water Supply Reports (2010; 2011, 2012; 2013)

The blending calculations offered in the DEIR have elected to use the analysis from a single monitoring well, DMW-13 Middle, but as is made clear in the foregoing analysis by GEI this single well is not representative of the wells in the project area west of the East Side Canal listed in Table 3-6. Even so the blending calculations do produce water exceeding drinking water standards. From page 3-60 of the DEIR:

“In general, most constituents meet drinking water standards (Table 3-7). Due to limited water quality data for most of the wells west of the East Side Canal, BVWSD monitoring well 13 – middle zone, was used as a representative well. For wells located to the east of the East Side Canal, conductivity, sulfate, and TDS were exceeded. For wells located west of the East Side Canal, sulfate and TDS slightly exceeded the drinking water standards. Even though most constituents are below drinking water limits, it was observed that each side had varying constituent levels. For example, the west side does not have arsenic, however on the east side, the concentrations are about half the MCL at 5.6 parts per billion (ppb).”

**Table 3-7. Water Quality of Wells in and Around Project Area**

Constituent	Drinking Water Standard	West of East Side Canal	East of East Side Canal	
			Average	Max
Antimony (ppb)	MCL = 6	0	0.7	5
Arsenic (ppb)	MCL = 10	0	2.7	5.6
Boron (ppm)	NL = 1	0.1	0.2	0.5
Bromide (ppm)	N/A	No data	0.09	0.1
Chloride (ppm)	SMCL = 250	54	75	95
Conductivity (µS/cm)	SMCL = 900	922	891	976*
Gross Alpha (pCi/L)	MCL = 15	0	11.6	14.6
Hardness (ppm)	Very Hard > 181	243	179	289
Iron (ppb)	SMCL = 300	44	80	240
Manganese (ppb)	SMCL = 50	49	11	25
Nitrate as N (ppm)	MCL = 10	0.1	4.7	6.8
Sodium (ppm)	DWR = 200	107	99	123
Sulfate (ppm)	SMCL = 250	310*	257*	334*
Total Dissolved Solids (ppm)	SMCL = 500	641*	589*	808*
Total Organic Carbon (ppm)	N/A	No data	0.6	0.8
Uranium (pCi/L)	MCL = 20	5.5	11	15

\*Indicates that result is over the drinking water MCL

**Table 3-6. Wells used in Water Quality Analysis**

West of East Side Canal	East of East Side Canal
BVWSD Production Well	BVWSD Private Landowner Well
DW01	D04
DW02	Kern Water Bank
BVWSD Monitoring Well	13D01, 13D02, 13D03
DMW 11A & 11B	West Kern Water District
DMW 12A & 12B	NW-1
DMW 13-Shallow, 13-Middle, 13-Deep	NW-2
BVWSD Private Landowner Well	NW-3
D15	NW-4
	NW-5

The blending analysis is therefore significantly biased in that despite Table 3-6 list of “Wells used in Water Quality Analysis” only the data from DMW-13 Middle was actually used and as is made clear in the GEI 2017 Memorandum the other wells west of East Side Canal have some serious contaminant problems.

**Part II – Feasibility of the Project and Cumulative Impacts**

As is apparent from the water quality and blending analysis, it will be extremely difficult for the Project to meet the State Water Project (SWP) standards for pumping groundwater production into the California Aqueduct, and additionally there is no evaluation of cumulative water quality impacts of the Project along with other banking projects’ pumping non-SWP water into the Aqueduct and having to meet SWP water quality standards. The only water available for blending that would likely enable the water quality standards to be met is Kern River water. However, at a time when groundwater is being withdrawn from storage it is extremely unlikely that Kern River water would be available for blending, which highlights another major deficiency of the DEIR.

The DEIR assumes that the project would add 100,000 acre.ft to the aquifers in eight (8) months and 25,000 acre.ft/year would be recovered in a six month window for each of four years in a time of drought, but the analysis is very rudimentary. A more appropriate approach would have been to use the Kern River monthly flow rate record, for however long a period as is available, as a surrogate for climate and perform a series of simulations that would enable the most productive operating scenario to be developed that recognizes the ephemeral nature of Kern River flows. These simulation techniques are widely used in designing facilities that are dependent upon river flows that vary significantly. For example, Sacramento Regional Sanitation has used simulations to optimize the design of their wastewater treatment and storage because the ability to discharge to the Sacramento River is controlled by the river flows, which are not predictable, but for which a long record is available.

The DEIR for the Palms project has no discussion at all about the variability of the Kern River flow or the return frequency of possible recharge opportunities. The infiltration project and its associated wetlands will be very dependent upon the river flow and yet there is no discussion of the impact of the frequency of sustained drought on the constructed wetland. The issue is not even discussed in the DEIR.

Given that the only water available for use in blending of BVWSD water to meet water quality standards required for SWP pump in is only available during times of water surplus, it is not at all clear that the proposed project is even viable.



## ERICSON JOHN LIST

Principal Consultant, Flow Science Incorporated

Principal Consultant, Environmental Defense Sciences

Professor *Emeritus* of Environmental Engineering Science,  
California Institute of Technology

TEL: 626-233-6014 (cell), 626-304-1134 (office)

e-mail: [ejlist@flowscience.com](mailto:ejlist@flowscience.com)

### PERSONAL

Citizenship: U.S.A. Passport No. 527853475  
Global Entry No. 983556301

Birthdate: March 27, 1939

Place of Birth: Whakatane, New Zealand

Home Address: 59/210 Maranui Street, Papamoa Beach, New Zealand

Office Address: 202 S Lake Ave, Suite 294, Pasadena, CA 91101

### EDUCATION

1965 Ph.D. California Institute of Technology (Applied Mechanics and Mathematics)

1962 M.E. (Civil Eng.) University of Auckland, N.Z.

1962 B.Sc. (Mathematics) University of Auckland, N.Z.

1961 B.E. (First Class) University of Auckland, N.Z.

### POSITIONS HELD

Dr. List is currently Principal Consultant of Flow Science Incorporated and Environmental Defense Sciences. He was Professor of Environmental Engineering Science at the California Institute of Technology from 1978-1997. He joined the faculty at Caltech in 1969 as an Assistant Professor, after spending three years as a lecturer and senior lecturer at the University of Auckland. For the period 1980-1985, he was Executive Officer for the Environmental Engineering Science Graduate Program at Caltech.

### TEACHING EXPERIENCE

Fluid mechanics, turbulent diffusion, density-stratified flow, flow in porous media, introductory oceanography and meteorology, classical applied mathematics, singular perturbations, non-linear waves, mathematical programming and simulation, probability and statistics, solid mechanics, hydrologic transport processes, environmental fluid mechanics.

### RESEARCH INTERESTS

Turbulent diffusion, buoyancy-modified flows, particle coagulation, coastal ocean and estuarine processes, reservoir modeling, transient flows, flow in porous media.

#### INSTITUTE AFFAIRS

Professor List served on sixteen different administrative and faculty committees, including a term as Vice-Chair of the Faculty (1979-81), and chair of the following Faculty Committees: Athletics and Physical Education (1975-79), Curriculum (1981-84), Membership and Bylaws (1979-81), and Nominating (1978-79). He served on the Jet Propulsion Laboratory Classified Research Oversight Committee for a period of six years.

#### EDITOR

Journal of Hydraulic Engineering, American Society of Civil Engineers, 1984-1989

#### MEMBERSHIP

Member, American Consulting Engineers Council

Honorary Life Member and Fellow of American Society of Civil Engineers

Chair, Hydrologic Transport and Dispersion Committee, 1983-84

Chair, Awards Committee, Hydraulics Division, 1994

Co-Chair, Third International Symposium on Stratified Flows, 1987

Chair, Engineering Excellence Committee, 1989

#### AWARDS AND RECOGNITION

Fulbright Scholar, 1962

National Science Foundation Award for Special Creativity, 1982

Who's Who in America (20 years)

#### REGISTRATION

Professional Civil Engineer No. 36791, State of California

#### VISITING COMMITTEES

University of California, Irvine, School of Engineering, 1983, 1989

Stanford University, Palo Alto, Department of Civil Engineering, 1984

University of British Columbia, School of Engineering, 1990

#### CONSULTING

Professor List has consulted with more than 800 industrial organizations, consulting engineers and governmental agencies, including Southern California Edison, ChevronTexaco, ExxonMobil, Astra-Zeneca, Lockheed Martin, IBM, City and County of San Francisco, City of Los Angeles, City of Seattle, City of San Diego, City and County of Honolulu, Southern California Metropolitan Water District, Southern Nevada Water Authority, Los Angeles and Orange County Sanitation Districts. He has

authored reports in the following areas of work: geothermal flows, river control modeling, power plant cooling systems, brine and wastewater diffusers, dredge spoil disposal, river dispersion, solar heat storage systems, reservoir destratification and mixing, well testing and failure, pulsation control and water hammer, pipeline failure, groundwater mass balance, ocean current and temperature analysis, acoustic resonance in piping systems, gas transfer, ocean dispersion, and biodegradation of organo-chlorines.

## PUBLICATIONS

Professor List is co-author of the texts *Mixing in Inland and Coastal Waters* (Academic Press, 1979), *Turbulent Buoyant Jets and Plumes* (Pergamon Press, 1983), and the award-winning *Handbook of Groundwater Development* (Wiley, 1990). In addition, he is the author or co-author of the following refereed publications:

- [1] "Steady flow of precipitation to an infinite series of tile drains above an impervious layer," *J. Geophys. Res.*, **29**: 3371-3381, 1964.
- [2] "A quasi-stable density-stratified flow in a saturated porous medium," *Proc. 2nd Aus. Conf. Fluid Mech.*, Auckland, N.Z., December 1965.
- [3] "Lateral dispersion in saturated porous media," *J. Geophys. Res.*, **72**: 2531-2541, 1967 (with N.H. Brooks).
- [4] "A two-dimensional sink in a density-stratified porous medium," *J. Fluid Mech.*, **33**: 529-543, 1968.
- [5] "An exact solution for a diffusive flow in a porous medium," *J. Fluid Mech.*, **36**: 17-19, 1969.
- [6] "Laminar momentum jets in a stratified fluid," *J. Fluid Mech.*, **45**: 461-574, 1971.
- [7] "A technique for smoothing river flows during hydro-electric power production," *Water Resources Research*, **7**(6): 1437-1447, 1971 (with R.B. Tattle).
- [8] "Energy and the environment in Southern California," *Engineering and Science*, **35**(2): 14-17, 1971.
- [9] "A study on disposal of brine in an estuary," *J. Water Polln. Cont. Fed.*, **45**(11): 2335-2344, 1973 (with A.B. Pincince).
- [10] "Turbulent entrainment in buoyant jets and plumes," *J. Hyd. Div.*, ASCE, **99**(HY9):1461-1474, September 1973 (with J. Imberger).
- [11] "Turbulence measurements in a two-dimensional buoyant jet using laser-Doppler velocimetry," *Proc. LDA Symposium*, Tech. Univ. of Denmark, Copenhagen, August 1975 (with N.E. Kotsovinos).
- [12] "Hydraulic modeling of thermal outfall diffusers - Interpretation of results," *Proc. XVI IAHR Congress*, Sao Paulo, Brazil, July 1975 (with R.C.Y. Koh).

- [13] "Variations in coastal temperatures on the Southern and Central California coast," *J. Geophys. Res.*, **81**(12):1971-1979, April 1976 (with R.C.Y. Koh).
- [14] "Spreading of buoyant discharges," *Proc. 9th Intern. Conf. Heat and Mass Transfer*, Int. Centre for Heat and Mass Transfer, Dubrovnik, Yugoslavia, 171-182, September 4, 1976 (with J.-C Chen).
- [15] "Plane turbulent buoyant jets - Part 1: Integral properties," *J. Fluid Mech.*, **81**(1): 25-44, June 9, 1977 (with N.E. Kotsovinos).
- [16] "Turbulent jets and plumes," *Ann. Rev. of Fluid Mech.*, **14**:189-212, 1982.
- [17] "Formation of frontal waves in density-induced fluid spreading," *Symposium on Flows in Stratified Fluids*, ASME Winter Annual Meeting, Boston, MA, 1983.
- [18] "Monte Carlo simulation of particle coagulation in continuous size distributions, I: Brownian motion and fluid shearing," *J. Fluid Mech.*, **143**: 367-385, 1984 (with H.J. Pearson and I.A. Valioulis).
- [19] "Monte Carlo simulation of particle coagulation in continuous size distributions, II: Intersparticle forces and the quasi-equilibrium hypothesis," *J. Fluid Mech.*, **143**: 387-411, 1984 (with I.A. Valioulis and H.J. Pearson).
- [20] "Numerical simulation of a sedimentation basin, I: Model development," *Env. Sci. Tech.*, **18**: 242-247, 1984 (with I.A. Valioulis).
- [21] "Numerical simulation of a sedimentation basin, II: Design application," *Env. Sci. Tech.*, **18**:248-253, 1984 (with I.A. Valioulis).
- [22] "Collision efficiencies of diffusing spherical particles accounting for hydrodynamic, van der Waal's and electrostatic forces," *Adv. Colloid and Interf. Sci.*, **20**:1-20, 1984 (with I.A. Valioulis).
- [23] "A numerical evaluation of the stochastic completeness of the kinetic coagulation equation," *J. Atmos. Sci.*, **41**(16):2516-2529, 1984 (with I.A. Valioulis).
- [24] "Statistical and spectral properties of tracer concentration in round buoyant jets," *Int. J. Heat and Mass Trans.*, **30**(10):2059-2071, 1987 (with P.N. Papanicolaou).
- [25] "Turbulence structure near a sharp density interface," *J. Fluid Mech.*, **189**: 189-209, 1988 (with I.A. Hannoun and H.J.S. Fernando).
- [26] "Turbulent mixing at a shear-free density interface," *J. Fluid Mech.*, **189**: 211-234, 1988 (with I.A. Hannoun).
- [27] "Investigations of round vertical turbulent buoyant jets," *J. Fluid Mech.*, **195**: 341-391, 1988 (with P.N. Papanicolaou).
- [28] "The Third International Symposium on Density-Stratified Flows," *J. Hydr. Eng., Proc. ASCE*, **114**(2):125-133, 1988 (with G. Jirka).
- [29] "Large-scale structure in the far field of buoyant jets," *J. Fluid Mech.*, **209**: 151-190, 1989 (with D. Papantoniou).



- [30] "Diffusion and dispersion in coastal waters," *J. Hydr.Eng.*, **116**(10):1158-1179, 1990 (with G. Gartrell and C.D. Winant).
- [31] "Kinetic analysis of virus adsorption and inactivation in batch experiments," *Water Resources Research*, **29**(7):2067-2085, 1993 (with S. Grant and M. Lidstrom).
- [32] "An experimental investigation of vertical mixing in two-layer density-stratified shear flows," *Oceans and Atmospheres*, **19**:147-174, 1993 (with G. Sullivan).
- [33] "Transition from jet plume dilution to ambient turbulent mixing," *Recent Res. Advances in the Fluid Mechanics of Turbulent Jets and Plumes*, 1-11, 1994 Kluwer Publishers (with Regina Dugan).
- [34] "On mixing and transport at a sheared density interface," *J. Fluid Mech.* **273**:213-239, 1994 (with G. Sullivan).
- [35] "Sudden pressure drop and pipeline failure - Case studies," *Hydraulics of Pipelines*, ASCE, pp.339-355, 1994.
- [36] "Environmental Fluid Mechanics" *Research Trends in Fluid Mechanics*, J.C. Lumley et al (Eds), American Institute of Physics, pp.148-166, 1996.
- [37] "A novel approach for determining flow patterns in a reservoir," *Proc. North American Lake Management Society*, Minneapolis, Minn. Nov. 14-15, 1996 (with G. Pasek, I.A. Hannoun and S.C. Paulsen)
- [38] "A study of transport and mixing in natural waters using ICP-MS: Water-particle interactions" *Water, Air and Soil Pollution*, **99**:146-156, 1997 (with S.C. Paulsen).
- [39] "Tracing discharges in ocean environments using a rare earth tracer" *Proc. 27<sup>th</sup> IAHR Congress*, San Francisco, August, 1997 (with S.C. Paulsen).
- [40] "Simulation of sludge pumping" *Water Env. Res.* **70**(2): 197-204, 1997 (with I.A. Hannoun and W-L. Chiang)
- [41] "Using hydraulic modeling to optimize contact time" *J. AWWA*, **90**(8): 77-87, 1998 (with I. A. Hannoun and P. Boulos).
- [42] "Vapor cavity formation and collapse: Field evidence for major pipeline damage" FEDSM99-6886, *Proc. 3<sup>rd</sup> ASME/JSME Joint Fluids Eng. Conf.*, San Francisco, July 18-23, 1999 (with R. Solbrig, J. Burnam and J. Hoggatt)
- [43] "Modeling variability in <sup>210</sup>Pb and sediment fluxes near Whites Point Outfalls, Palos Verdes Shelf, California. *Env. Sci. Tech.*, **33**:3077-3085, 1999 (with S. C. Paulsen and P.H. Santschi)
- [44] "Comment on 'In situ measurements of chlorinated hydrocarbons off the Palos Verdes Peninsula, California" *Env. Sci. Tech.*, **33**:3927-3928, 1999 (with S.C. Paulsen and P.H. Santschi).
- (45) "Use of ELCOM and CAEDYM for Water Quality Simulation in Boulder Basin", In *the Proceedings of the NALMS 23rd International Symposium*, November 4 - 8,

- 2003, Mashantucket, CT (with I. A. Hannoun, K. Bowman-Kavanagh, W. Chiang, L. Ding, D. Karafa, I. Rackley).
- (46) “Receiving Water Analysis for Regional Seawater Desalination Plant in Carlsbad, California”, *Proceedings of the American Membrane Technology Association (AMTA) 2006 Biennial Conference and Exposition*, August 2, 2006, Anaheim, California (with I. A. Hannoun, L. Ding, B. Martin).
- (47) “Joint Water Pollution Control Plant outfall modeling,” *Proceedings, Marine Waste Water Discharge Organization Symposium*, October 27, 2008 (with I.A. Hannoun, L. Ding, and N. Hicks).
- (48) “3D modeling of a treated effluent discharge off the Palos Verdes Shelf, California,” *Proceedings, Marine Waste Water Discharge Organization Symposium*, October 31, 2008 (with I. A. Hannoun, L. Ding, and N. Hicks).
- (49) “Development and application of a three-dimensional water quality model for Lake Mead,” *Proceedings, North American Lake Management Society*, November 13, 2008 (with I.A. Hannoun, A. Preston, K. Bowman Kavanagh, L. Orphan, and P. Roefer).
- (50) “Development and application of a three-dimensional water quality model to Lake Mead,” *Proceedings, Lake Mead Science Symposium*, January 13, 2009 (with A. Preston, I. A. Hannoun, K. Bowman Kavanagh, L. Orphan, K. Turner, and P. Roefer).
- (51) “Understanding nutrient limitations in Lake Mead,” *Proceedings, Lake Mead Science Symposium*, March 6, 2012 (with with L. Ding, I. A. Hannoun, T. Tietjen and P. Roefer).
- (52) “Predicting effects of reservoir expansion with three-dimensional modeling: Case study of Los Vaqueros Reservoir,” *Lake and Reservoir Management*, 29:217-232, 2013 (with B. Martin, Li Ding, and I. A. Hannoun).
- (53) “Three-dimensional management model for Lake Mead, Nevada, Part 1: Model calibration and validation,” *Lake and Reservoir Management*, 30:285-302, 2014 (with A. Preston, I. A. Hannoun, I. Rackley, and T. Tietjen).
- (54) Three-dimensional management model for Lake Mead, Nevada, Part 2: Findings and applications,” *Lake and Reservoir Management*, 30:303-319, 2014 (with A. Preston, I. A. Hannoun, I. Rackley, and T. Tietjen).
- (55) “Climate Change and Decreasing Levels in Lake Mead: Modeling Changes in Thermal Structure and Water Quality,” *Proceedings, Nevada Water Resources Association Annual Conference*, February 4-6, 2014, (with A. Preston, T. Tietjen, and P. Roefer).
- (56) “Development of a phosphorous budget for Lake Mead,” *Lake and Reservoir Management*, 30:143-156, 2014 (with L. Ding, I. A. Hannoun, and T. Tietjen).

# Memo



**To:** Tim Ashlock, Assistant Manager and Maurice Etchechury, Engineer  
Manager Buena Vista Water Storage District

**From:** Jackie Takeda and Stephanie Hearn, Water Quality Specialists

**c:** Ginger Gillin and Stephanie Breeden, GEI Consultants, Inc.

**Date:** February 17, 2017

**Re:** Water Quality Review of Groundwater Wells for “The Palms” Recovery  
Project  
GEI Project No. 1506650

---

## Introduction

Buena Vista Water Storage District (BVWSD or District) has engaged the services of GEI Consultants, Inc. (GEI) to provide California Environmental Quality Act (CEQA) compliance support services for the Palms Groundwater Bank – Recovery Phase (Project). As one of the task orders of the Project, Task 6B – Development of Water Treatment, an evaluation of existing groundwater quality in the Project area was conducted to develop a water treatment plan and to determine if groundwater in the Project area meets the water quality requirements for discharge into the California Aqueduct (Aqueduct), as defined in the Department of Water Resources (DWR) Policy.

GEI evaluated existing water quality data that represents production wells and monitoring wells throughout the District. While this data extends beyond the Palms Project boundaries, it provides insight toward potential challenges BVWSD may face in developing their Project. Wells that represent the Project area are District wells 01 and 02, and Monitoring Wells 10 at the northern Project boundary and 12 near the southern boundary.

This technical memorandum provides:

- Analysis of existing water quality from wells throughout the District.
- Assessment of what is needed to comply with DWR’s Water Quality Policy for Acceptance of Non-Project Water into the Aqueduct (Pump-In Policy).
  - DWR Pump-in Policy requires review of historical data that is no more than 3 years old. Results must be available for all constituents listed in California Code of Regulations Title 22 drinking water standards and DWR’s Constituents of Concern (COC) listed in their Policy.
  - Pump-in water must demonstrate that the water source is of consistent, predictable, and acceptable quality and will not impair water quality of the State Water Project (SWP).
- Recommends additional water quality sampling to characterize the Project groundwater quality.
- Provides a sampling and treatment plan that will effectively demonstrate to DWR and the State Water Resources Control Board – Division of Drinking Water (DDW) that water in

the Project area is of consistent, predictable, and acceptable quality that meet standards for pumping into the Aqueduct.

GEI has evaluated DWR's Pump-In Policy for the SWP and BVWSD's historical groundwater results to assess if the Palms Project meets the DWR's requirements. Findings that are detailed in this report are:

- Water quality data is only available for a limited number of District and Landowner wells, the majority of which are outside of the Project area, and the number of samples from each well vary substantially. This data is compared against monitoring wells which are representative of the aquifer with depths ranging from 200 to 700 feet below ground surface (bgs).
- Constituents that exceed Title 22 standards, or are showing increasing trends and are at risk of exceeding the standards ( $\geq 50\%$  of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) are:
  - Primary Constituents: arsenic; nitrate; and gross alpha.
  - Secondary Constituents: iron; manganese; conductivity; sulfate; total dissolved solids; chloride; and hardness.
  - Notification Level Constituents: boron

## **Background**

BVWSD is planning the Recovery Phase of the Project. GEI is assisting BVWSD in developing the Project description and the CEQA strategy. In a June 2016 workshop to review the results of the preliminary Groundwater Hydrogeologic Assessment conducted by Todd Groundwater, the Project team identified that some of the groundwater in the Project area does not meet the water quality requirement for discharge into the Aqueduct. Consequently, water quality review is an important component of this Project. GEI's review of the existing water quality data throughout the District provides insight to potential challenges with water recovered in the Palms Groundwater Bank. This preliminary assessment will provide a framework for a sampling and water treatment plan that will be required prior to pumping into the Aqueduct. Conceptually, the water treatment plan will include blending of higher and lower quality water with one centralized water treatment plant located near the Aqueduct.

## **Analysis of Water Quality from Groundwater Wells in Project Area**

Water quality data available through BVWSD's electronic database includes historical sample results categorized as "District Wells," "BVWSD Wells," and "Monitoring Wells." An analysis of each set of data is discussed by constituent groups in the following sections.

Buena Vista samples landowner wells that are available for the District's use: these wells are referred to as District wells. Historical water quality data was available for seven District wells. Available data is fairly limited with only three to four sample results for most wells, many of them more than 3 years old. Buena Vista also has seven production wells with historical water quality data, referred to as BVWSD wells. Similar to the District wells, there is limited data available.

The greatest volume of data is available from the 14 monitoring wells located throughout District. In contrast to production well data, the available data and monitoring frequency is more expansive in the monitoring wells. Appendix A provides summary tables of water quality data: bolded red values in these tables indicate results that exceed applicable drinking water standards.

### ***Primary Constituents***

Primary drinking water standards are set by both federal (Environmental Protection Agency [EPA]) and state (DDW) agencies to protect public health by limiting the levels of certain constituents in drinking water.

#### **Arsenic**

Arsenic has a primary MCL of 10 parts per billion (ppb). The major source of arsenic in groundwater is erosion of natural deposits or leaching from anthropogenic sources (pesticides, insecticides, and algacides). A study of public water sources throughout California shows that arsenic commonly occurs throughout the Central Valley, with higher prevalence in Kern County.

Of the 14 monitoring wells, seven exceed the MCL and two are near the MCL. Wells DMW02 and DMW04 have exceptionally high concentrations, near 100 ppb: both of these wells represent the aquifer between 250 and 300 feet bgs. DMW06 (410 to 440 feet bgs) has arsenic that ranges from 36 to 45 ppb. Moderate concentrations are found in wells DMW 01, 05 and 07 (arsenic ranges from 12 to 22 ppb). Generally, wells with the highest concentrations are located in the northern and central part of the District and are outside of the Project area, except for DMW12A, which is located in the southernmost part of the District.

Wells DMW12A and B show that arsenic highest in the deeper aquifer. Well 12A, screened from 600 to 700 feet bgs, contains ~15 ppb arsenic and well 12B, screened from 355 to 455 feet bgs, does not contain any arsenic. These results appear to be in contrast with the wells in the northern part of the District. While there is no clearly defined aquifer zone with high concentrations of arsenic, the highest concentrations appear to be near the surface in the northern wells. This inverse trend between depth and arsenic concentration may be an indicator of the source of arsenic. Anthropogenic arsenic will occur in the highest concentrations near the surface whereas naturally occurring arsenic concentrations will increase with depth.

Three of the seven District wells have arsenic slightly above the MCL: D01, D02, and D07. Wells D01 and D02, both within the Project area, have concentrations ranging from 7 to 14 ppb, and well D07 has higher concentrations ranging from 17 to 25 ppb.

Two of seven BVWSD wells exceed the MCL. Well 01H01 ranges in concentrations from 10 to 12 ppb. Well 23B arsenic concentrations are nearly two times the MCL, ranging from 16 to 24 ppb.

#### **Nitrate**

Nitrate has a primary MCL of 45 parts per million (ppm) as nitrate (NO<sub>3</sub>) or 10 ppm as nitrogen (N). Most elevated concentrations of nitrate come from anthropogenic sources: typically from runoff and leaching from fertilizer or leaching from septic tanks and sewage. The State Water Quality Control Board considers nitrate a focus contaminant because of its acute health effects. Consequently, State regulatory agencies are taking a multifaceted approach of protecting consumers through drinking water programs and reducing the source of contamination through the Irrigated Lands Regulatory Program (ILRP). The ILRP program was initiated in 2003 to prevent agricultural runoff from impairing surface water and in 2012 the program was expanded to address impairment to groundwater.

Nitrate levels from District production wells showed increasing trends. Well D03 nitrate levels have been consistently increasing, exceeding the MCL in July 2014; well D05 shows an increasing trend with levels at slightly over one half of the MCL. Data reviewed for BVWSD wells show very low nitrate concentrations and no detectable levels were found in many wells.

Similar to BVWSD wells, most sample results show very low concentrations of nitrate, if any. There was an anomaly in April 1993 for wells DMW01, DMW02 and DMW04 with one unusually high result; wells DMW03 and DMW05 also had elevated nitrate levels but did not exceed the MCL. Other nitrate samples collected for these wells before and after April of the same year, were very low.

### **Gross Alpha**

Gross alpha measures overall radioactivity in groundwater and has been detected in a few wells. The majority of its particles are composed of uranium, which has not been tested. Therefore, these results can only be considered an indicator of potential radiological contamination that may need to be addressed in the Project treatment plan. The MCL for gross alpha is 15 pico Curies per liter (pCi/L). The most common source of radioactivity in groundwater is erosion of natural deposits.

District wells were sampled for gross alpha in 2013 and for a majority of the wells, only one sample was collected. All wells, except for well D07, exceed the MCL. BVWSD wells 01H01, 11P, 14M02 had two samples for each well and in each case there was one sample that was below the MCL while the second, exceeded the MCL for gross alpha. This occurrence is fairly typical for constituents that leach into groundwater from erosion of natural deposits: when wells are most actively pumping, higher contaminant concentrations are expected. For the monitoring wells, gross alpha samples were collected from two wells, one sample each with both exceeded the MCL.

Gross alpha test methods are measuring particle activity, and thus, there is a possibility that the high levels of total dissolved solids (TDS) in BVWSD's groundwater may interfere with the analysis, resulting in falsely high results. While the high gross alpha results do not directly correlate to high TDS in the data, GEI recommends using a method that limits analytical interferences: EPA Standard Method 900.0 uses sample preparation techniques that compensate for high TDS waters.

### ***Secondary Contaminants***

Secondary MCLs (SMCL) apply to constituents that do not pose a health threat at the established limit but are provided as guidelines to assist water users in managing their water quality. SMCLs are set at levels that protect aesthetic quality of the water. With contaminant levels at or below SMCL's, the water is considered aesthetically pleasing (meets the users expectations for clean water).

### **Hardness**

Hardness is a measure of the amount of minerals (predominately calcium, magnesium, and carbonate) the water contains. Water becomes hard as it passes over or through certain geological formations that contain calcium or magnesium. While there is no applicable standard or MCL for hardness, it is an important compound for BVWSD to consider as it could negatively impact their treatment plant performance. High levels of hardness results in solids loading and scaling on filter media, and equipment such as pumps, valves and injectors. To give perspective on hardness levels, water is considered soft if its hardness is less than 75 ppm; moderately hard at 75 to 150 ppm; hard at 150 to 300 ppm, and very hard at 300 ppm or higher. The average hardness of District wells ranges from 150 to 354 ppm. BVWSD wells average from 42 to 576 ppm. Wells within the Project area average from 273 to 2,800 ppm.

The water is very hard for all the wells except for BVWSD well 06B02 and monitoring wells DMW08 and DMW10B. Monitoring well data, particularly wells 10, 11, and 12 that have two screened intervals, indicate that hardness is highest in the upper aquifer and is significantly lower in the deeper aquifer.

### **Iron and Manganese**

Iron and manganese are fairly common throughout District. The SMCL for iron and manganese are 300 ppb and 50 ppb, respectively. Typically, iron and manganese are naturally occurring as a result of

leaching from natural deposits. The greatest concern with high levels of these metals is staining on contact surfaces and clogging of plumbing fixtures from the precipitate they form.

While only two District wells have concentrations that exceed the MCL's, iron and manganese have been detected at BVWSD wells and monitoring wells in a substantial number of samples. District well D01 had unusually high concentrations in the two samples collected July 25, 2001; subsequent samples collected in 2004 and 2007, had very low sample results. This implies that either sampling conditions during the 2001 collections were not representative of the aquifer, or modifications were made to the well to mitigate this contamination. Without information about the sampling condition (i.e., well actively pumping) during the 2001 sample collection, GEI cannot provide insight to the appropriate level of concern for these wells.

Well D04 shows an increasing manganese trend reaching 50 ppb in June 2013. Well D07 has a single occurrence of high manganese; 230 ppb collected in June 2013. Single occurrences imply sloughing of corrosion or scale buildup from the casing, rather than representing the aquifer.

Iron and manganese are issues in a majority of the BVWSD wells. All sample results for well 23B are extremely high: average iron is 14,082 ppb and manganese is 2,610 ppb. Since the sample results are consistently high, this data is considered representative of the aquifer. With the levels this high, it is unlikely that blending will provide adequate contaminant reduction and therefore will not be an acceptable treatment method. Well 11P has iron levels approaching one half of the SMCL with an increasing trend; manganese is also increasing with the most recent sample over the SMCL. All other wells have fluctuating results over the SMCL with no discernable trend, potentially an issue related to well operation during sampling. Well 06B02 is an exception as it is the only well with trace levels of iron or manganese.

Monitoring well DMW04 had high manganese samples from 1991 to 2002, then it dropped below the SMCL, only to increase again from 2013 to 2015. Unlike other constituents, monitoring wells 10, 11, and 12 don't reveal any consistent insight towards depth of contaminants or general location.

- Wells 10A (270 - 450 feet bgs) has exceptionally high iron and moderately high manganese. In contrast, Well 10B (550 - 650 feet bgs) does not have any measurable levels.
- Wells 11A and 11B (560 - 660 feet; 370 - 470 feet bgs, respectively) both have exceptionally high concentrations of iron and manganese.
- Wells 12A and 12B (600 - 700 feet; 355 - 455 feet bgs, respectively) have moderately high iron levels, and manganese near the SMCL. In contrast to wells 10A and B, higher iron and manganese concentrations are found in the deeper aquifer (wells 10A and B showed high concentrations in the shallower aquifer).
- Well 02 (260 - 300 feet bgs) has low concentrations of iron and moderately high concentrations of manganese.

After reviewing the data, it's clear that iron and manganese are of concern for both production and monitoring wells. For some wells, limited data makes it difficult to see a trend, and in some cases, well operation at the time of sampling may have influenced the results. Additionally, there appears to be unit discrepancies that may have occurred during data entry and may be the reason that some results are extremely high. This concern is further discussed in the report conclusions.

#### **Total Dissolved Solids: Conductivity, Sulfate and Chloride**

Total dissolved solids (TDS) are primarily comprised of inorganic salts (calcium, magnesium, potassium, sodium, bicarbonates, chlorides, and sulfates) and some small amounts of organic matter



that is dissolved in the water. Conductivity typically represents approximately 60 percent of the water's TDS. While TDS represent conductivity, sulfate and chloride, these constituents have SMCLs presented as consumer acceptance ranges, referenced in Table 1. DDW generally treats the Upper Limit as the SMCL.

**Table 1. Consumer Acceptance Ranges for Secondary Constituents**

Constituent, Units	Maximum Contaminant Level		
	Recommended	Upper Limit	Short Term
TDS, ppm	500	1,000	1,500
Conductivity, $\mu$ S/cm	900	1,600	2,200
Chloride, mg/L	250	500	600
Sulfate, mg/L	250	500	600

Conductivity, sulfate, and TDS results for a majority of the production and monitoring wells are all over their respective Upper Limits. Overall, a majority of the production and monitoring well samples demonstrate increasing levels of these constituents to concentrations that exceed their respective limits.

These constituents are an important consideration for the Project as they are listed as DWR's COC and must be reported with BVWSD's Pump-in Proposal. BVWSD's levels exceed the drinking water standard consequently, treatment will be required to reduce these constituents to levels below their respective SMCLs. Treatment for these constituents is generally not a simple process as salts are only removed by high pressure membranes. Blending the wells and water from the Kern River and the Friant Unit of the Central Valley Project may also be an option but this option will be highly dependent on water quality of the Project wells, planned Project operation and availability of surface water. It will be important to thoroughly characterize the components of TDS in the Project area to identify the appropriate treatment train.

Since these constituents are monitored more closely in the Tulare Lake Basin, there is enough data available from the monitoring wells to make reasonable conclusions regarding their occurrence. Similar to other surface contaminants, the highest concentrations are found in the shallower part of the aquifer. When reviewing the production wells data, most conductivity, sulfate, and TDS levels were over the SMCL. The only BVWSD well that has levels below the SMCL is well 06B02.

BVWSD well 14M02 has chloride results above both the Upper Limit and Short Term acceptance limit. The historical max result was 2,230 ppm with an average was 886 ppm. Even though there were 12 samples, no clear visible trend was observed. District wells D03 and D04 show an increasing trend; wells D01 and D02 do not show a clear trend but are in ranges closer to the SMCL; and well D05 has a steady trend near the SMCL. Well D06 is trending down with results greater than the SMCL. Well D07 results are all below the SMCL, but there is a possible increasing trend in chloride levels.

### **Notification Level Contaminants**

Notification levels (NL) are health-based advisory levels established for constituents in drinking water that currently do not have enforceable standards (primary or secondary MCLs). The only NL contaminant tested and detected in BVWSD wells is boron. While this may not be a constituent of concern with DWR's Pump-in Proposal (PIP), it is discussed in this report to provide a comprehensive discussion of water quality within BVWSD.

**Boron**

Boron is a regulated contaminant with a NL of 1 ppm. The most prevalent sources of boron in groundwater are from leaching of rocks and soils, wastewater, and fertilizers or pesticides. Boron is a potential issue for a majority of the production and monitoring wells. For all but one District well, results indicate an increasing trend of higher concentrations approaching the NL. Well D06 indicates levels over the NL. Wells D03, D04, and D05 are at levels one-half of the NL with an increasing trends. Historical samples indicate that boron may be a potential issue.

There are two BVWSD wells, 01H01 and 14M02, which had boron levels close to the NL of 1 milligrams per liter (mg/L). Well 01H01 had one of two samples at 0.9 mg/L. With limited data for well 01H01, no trend is available. Well 14M02 has a longer history of boron sampling since July 1998, however there is no conclusive trend. The most recent sample collected in 2008 was close to the NL.

Monitoring wells DMW02, DMW03, DMW04, and DMW06 have boron levels close to or over the NL. For DMW02, there are seven that are above 1 ppm, with the highest at 1.4 ppm. Graphing of these samples demonstrate an increasing trend. DMW03 has a similar increasing trend. DMW04 and DMW06 had a few, or just one, samples that were over the NL, recent samples however, indicate DMW04 and DMW06 are trending downward. The majority of boron monitoring results was conducted prior to 2008.

**DWR Water Quality Policy and Implementation Process for Acceptance of Non-Project Water into the State Water Project**

It is the DWR policy to assist with the conveyance of water to provide water supply and to protect the SWP water quality within the Aqueduct. In order to facilitate this policy, DWR provides an implementation process to accept Non-Project water into the Aqueduct. The policy provisions are as follows:

- DWR shall consider and evaluate all requests for Non-Project water that will be pumped into the Aqueduct. Non-Project water is considered to be any water input into the Aqueduct that is not directly diverted from the Sacramento-San Joaquin Delta or natural inflow into SWP reservoirs.
- A proposal for any Non-Project water shall demonstrate that the water is of consistent, predictable, and acceptable quality.
- DWR will consult with SWP, existing Non-Project participants, and State Water Resources Control Board –DDW on drinking water quality issues relating to Non-Project water as needed to assure protection of SWP water quality.
- DWR's policy does not authorize the objectives of Article 19 of the SWP water supply contracts or drinking water MCLs to be exceeded.
- The policy shall not constrain the ability of DWR to operate the SWP for its intended purposes and shall not adversely impact SWP water deliveries, operation, or facilities.

When evaluating Non-Project water proposals for input into the Aqueduct, DWR uses a two-tiered approach. Tier 1 PIP has water quality that is essentially the same or better than what is in the Aqueduct: PIPs deemed Tier 1 are approved by DWR. Tier 2 PIP has different and possibly worse water quality than what is in the Aqueduct. Tier 2 PIPs are referred and reviewed by a Non-Project Facilitation Group who, if needed, makes recommendations to DWR in consideration of the PIP. Tier 2 PIP must demonstrate that the lower quality water with constituents exceeding MCLs is either treated or blended with better quality water so that the SWP water will not be degraded.

**BVWSD Pump-in Proposal**

BVWSD’s PIP needs to demonstrate that the Palms Project water is consistent, predictable, and of a reliable quality. This water quality assessment provides a better understanding on the quality of the groundwater wells and aids in building the foundation for writing the Palms PIP for DWR to review.

The Palms PIP should identify the water sources, planned operation, characterize the inflow water quality, and any anticipated impacts to SWP water quality and/or operations. A PIP is submitted at least 1 month prior to Project construction. The PIP also includes a water quality monitoring plan in order to continuously demonstrate that the water quality is consistent with the Aqueduct water.

GEI recommends BVWSD implement a water quality sampling program that includes all DDW Title 22 constituents and DWR’s COCs. Current COCs are arsenic, bromide, chloride, nitrate, sulfate, organic carbon, and TDS. DDW Title 22 samples are constituents with federal and state regulatory limits (MCLs, SMCLs, and NL) stated in California Code of Regulations for drinking water. DDW enforces these regulatory limits.

The sampling program will consist of initial well sampling, periodic re-testing, and some routine frequency sampling for select parameters (i.e. quarterly arsenic testing). DWR’s policy defines three monitoring options are: (1) Baseline tests for individual wells, (2) Baseline tests for representative wells, and (3) Self-directed. The recommended options for BVWSD would be either option 1 or 2. Table 2 shows the water quality monitoring required for options 1 and 2.

Option 3 would be for BVWSD to propose a monitoring program for DWR that includes COC, Title 22 sampling, and sampling at frequencies that demonstrate water entering the SWP is of consistent, predictable, and reliable quality. This is an option that will require detailed discussion based on the Palms operation and infrastructure.

**Table 2: Water Quality Monitoring**

	<b>Option 1: Baseline tests for Individual Wells</b>	<b>Option 2: Baseline tests for Representative Wells <sup>(1)</sup></b>
<b>Initial Sampling</b>	<ul style="list-style-type: none"> <li>Title 22<sup>(2)</sup> testing for all wells</li> <li>COC testing for all discharge locations to SWP</li> </ul>	<ul style="list-style-type: none"> <li>Title 22<sup>(2)</sup> testing for all representative wells</li> <li>COC testing at all wells participating</li> <li>COC testing for all discharge locations to SWP</li> </ul>
<b>Well Re-testing</b>	<ul style="list-style-type: none"> <li>Title 22 testing for all wells every 3 years</li> </ul>	<ul style="list-style-type: none"> <li>Title 22 testing for all wells every 3 years</li> </ul>
<b>Routine Frequency<sup>(3)</sup></b>	<ul style="list-style-type: none"> <li>COC testing quarterly at each discharge point to SWP</li> </ul>	<ul style="list-style-type: none"> <li>COC testing monthly at each discharge point to SWP</li> <li>COC testing required annually at each well</li> </ul>

**Notes:**

- <sup>(1)</sup> Representative well monitoring means that a group of wells that are manifold together and discharge to one pipe. Representative wells are to be identified on a case-by-case basis to be representative of the manifold area, well proximity, and water levels.
- <sup>(2)</sup> Title 22 results may not be more than 3 years old.
- <sup>(3)</sup> New programs or those with constituents that may degrade the water quality of the SWP need to conduct sampling on a routine basis such as weekly, monthly or quarterly to demonstrate the Project water is of consistent, predictable, and reliable quality. After that is achieved, then can follow the frequency stated in “Ongoing Monitoring.”

Initial Sampling is recommended for all wells in the Project area, regardless of existing data to develop a consistent dataset for the PIP. During review of existing data, GEI found that the following constituents have not been analyzed within the last 3 years, reference Table 3. In addition to the inorganic constituents listed in Table 2, organic compounds (volatile and synthetic) and complete radiologicals have not been analyzed.

**Table 3: Constituents not analyzed historically or within the last 3 years**

Aluminum	Chromium	Silver
Antimony	Hexavalent Chromium (newly added DDW MCL in 2014)	Zinc
Barium	Copper	Uranium
Beryllium	Mercury	Radium 226+228
Bromide	Nickel	Total Organic Carbon
Cadmium	Selenium	Organic Compounds

If historical data is used, the electronic dataset should be reviewed with laboratory packages to confirm the correct units of measure are recorded. Data was recorded for the following constituents: boron, copper, iron, and zinc with two different units of measure – mg/L (or ppm) and micrograms per liter ( $\mu\text{g/L}$  or ppb). For this analysis, the assumption was made that the units were recorded in ppb. GEI recommends reviewing original lab reports for these constituents to verify the units on the spreadsheets were accurately entered into BVWSDs electronic dataset.

DWR's review of PIP proposals should take no more than 1 month. Once DWR approves the water quality monitoring plan, and as long as BVWSD is participating in this PIP, DWR may conduct the following:

- Schedule periodic reviews of each operating Non-Project inflow
- Adjust changes in monitoring and testing as needed if:
  - Any new constituents are added to the list of drinking water standards by either EPA or DDW
  - Current MCLs are revised
  - In response to any:
    - New constituents of concern such as emerging contaminants
    - Changes in the water quality provided by the program
    - Changes in constituents background levels in the Aqueduct
- Conduct periodic water quality review of water quality monitoring results on the SWP from Non-Project water inflow

### Recommended Sampling Plan

In order for BVWSD to provide a PIP demonstrating that the Palms Project water pumped into the Aqueduct will not degrade the water quality in the Aqueduct, routine sampling must to be conducted since most results are over 3 years old and several required constituents have not been tested. Table 3 identifies constituents that have no historical results. Additional testing required for the PIP includes

organic compounds such as Volatile Organic Compounds and Synthetic Organic Compounds, as well as regulated radiological compounds.

GEI recommends collecting the full set of samples for each well following the DDW Title 22 Water Quality Monitoring Schedule (Appendix B) along with the COCs that are listed in the DWR Pump-In Policy. Samples should be collected when wells are actively operating in an effort to obtain samples that are representative of the aquifer. It is highly recommended to initiate a sampling program as early as practicable to support appropriate treatment planning and to develop a defensible dataset. At a minimum, sampling frequencies will follow the DWRs requirements listed in Table 2.

Once sampling commences and there is more water quality data available, BVWSDs Project team will have a better understanding on the type of centralized water treatment plant that will be necessary. Additional data will also provide a foundation of developing a PIP for DWRs review. GEI recommends that data is thoroughly reviewed as the results become available. If any anomalies are found, the prompt review will allow BVWSD to address any issues and immediately take corrective actions. Additionally, if increased monitoring is deemed necessary to better characterize water quality, this monitoring can be implemented before the PIP is prepared.

## **Conclusion**

This preliminary water quality assessment provides insight towards potential water quality issues BVWSD may face in developing a PIP. While the data represents a much larger geographic area than the Palms Project, increased awareness of potential issues enables the Project team to develop a comprehensive water quality study. Based on the sample results from Well 02 and monitoring well 12, iron and manganese are expected in the Project area. The sampling program should consider these key points that will apply to designing an appropriate water treatment system:

- With the Fe/Mn levels observed in BVWSD's historical data, it is unlikely that blending will provide adequate contaminant reduction and therefore will likely be an unacceptable treatment method.
- Additional issues with secondary constituents (conductivity/TDS and hardness) may complicate the treatment trains and should be identified early in the process.
- Historical samples indicate that boron may be a potential issue

It is highly recommended that BVWSD develop and coordinate a comprehensive water quality sampling program; review results; perform QA/QC on the laboratory packages; and make schedule adjustments based on sample results. This level of detailed water quality monitoring will aid in confidently identifying constituents that exceed drinking water standards, proposing the most appropriate centralized water treatment plant and developing the PIP for DWR review.

A list of required sample parameters (Title 22 and COC's), recommended test methods and the sample frequency. Some parameters are recommended for quarterly testing based on our finding in this data review, as well as DWR's requirements for a PIP. BC Laboratories provided a price list for analytical costs for the recommended sampling program. The estimated cost for each well is about \$2,900 per well. Appendix B provides a breakdown of the sample information and estimated costs.

## APPENDIX A

**Table 1: Water Quality Summary of District Wells**

Well	Arsenic (ppb)		Hardness (ppm)		Iron (ppb)		Manganese (ppb)		Nitrate (ppm)		Conductivity (µS/cm)		Sulfate (ppm)		Total Dissolved Solids (ppm)		Gross Alpha (pCi/L)	
	MCL = 10		N/A		SMCL = 300		SMCL = 50		MCL = 45		SMCL = 1600		SMCL = 500		SMCL = 1000		MCL = 15	
	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX
D01	-	<b>13</b>	230	270	<b>6839</b>	<b>20500</b>	<b>1395</b>	<b>4180</b>	0.3	0.4	<b>1102</b>	<b>1840</b>	<b>329</b>	<b>620</b>	<b>783</b>	<b>1360</b>	9.2	<b>17.1</b>
D02	6.75	<b>13.5</b>	327	390	0.08	0.12	7.5	30	3.9	5.4	511	572	152	164	320	370	-	-
D03	0	0	254	420	0.16	0.48	0.01	0.01	26	<b>46</b>	<b>953</b>	<b>1138</b>	234	<b>326</b>	<b>533</b>	<b>746</b>	-	-
D04	0.3	0.84	354	800	4.3	17	18	<b>50</b>	4.8	13	862	<b>1080</b>	226	<b>305</b>	<b>657</b>	<b>860</b>	<b>27</b>	<b>41</b>
D05	0.43	0.86	297	420	0.05	0.05	0.01	0.01	19	24.5	<b>3062</b>	<b>6480</b>	173	<b>450</b>	<b>2045</b>	<b>4760</b>	10	<b>16</b>
D06	1.1	1.4	352	430	0.06	0.07	0.01	0.01	38.8	<b>48.9</b>	<b>1475</b>	<b>5390</b>	242	<b>354</b>	<b>750</b>	<b>940</b>	-	10.7
D07	<b>17.3</b>	<b>25</b>	150	230	43.5	130	<b>76.7</b>	<b>230</b>	0.16	0.4	790	<b>1080</b>	229	<b>406</b>	<b>507</b>	<b>744</b>	0.6	0.93

**Notes:**

(-) no results available

Bolded red values indicates results over the respective MCL, SMCL, or NL

**Table 2: Water Quality Summary of BVWSD Wells**

Well	Arsenic (ppb)		Hardness (ppm)		Iron (ppb)		Manganese (ppb)		Nitrate (ppm)		Conductivity (µS/cm)		Sulfate (ppm)		Total Dissolved Solids (ppm)		Gross Alpha (pCi/L)	
	MCL = 10		N/A		SMCL = 300		SMCL = 50		MCL = 45		SMCL = 1600		SMCL = 500		SMCL = 1000		MCL = 15	
	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX
01H01	9.5	<b>12</b>	273	476	<b>500</b>	<b>680</b>	<b>380</b>	<b>730</b>	0.75	1.3	<b>1102</b>	<b>1840</b>	<b>329</b>	<b>620</b>	<b>783</b>	<b>1360</b>	9.2	<b>17.1</b>
06B02	-	3	42	52	73	90	5	5	0.1	0.2	511	572	152	164	320	370	-	-
06B03	-	-	197	305	-	-	-	-	0.2	0.5	<b>953</b>	<b>1138</b>	234	<b>326</b>	<b>533</b>	<b>746</b>	-	-
<b>11P</b>	1	1	304	390	75	120	43	<b>70</b>	3.2	5.4	862	<b>1080</b>	226	<b>305</b>	<b>657</b>	<b>860</b>	<b>27</b>	<b>41</b>
<b>14M02</b>	4.5	8	576	1600	221	<b>530</b>	38	<b>60</b>	0.2	0.12	<b>3062</b>	<b>6480</b>	173	<b>450</b>	<b>2045</b>	<b>4760</b>	10	<b>16</b>
14M03	-	1	292	1300	<b>643</b>	<b>1140</b>	20	30	0.2	0.5	<b>1475</b>	<b>5390</b>	242	<b>354</b>	<b>750</b>	<b>940</b>	-	10.7
23B	<b>16</b>	<b>24</b>	242	390	<b>14082</b>	<b>20500</b>	<b>2610</b>	<b>4180</b>	0.2	0.2	790	<b>1080</b>	229	<b>406</b>	<b>507</b>	<b>744</b>	0.6	0.93

**Notes:**

(-) no results available

Bolded red values indicates results over the respective MCL, SMCL, or NL.



**Table 3: Water Quality Summary of Monitoring Wells**

Well	Arsenic (ppb)		Hardness (ppm)		Iron (ppb)		Manganese (ppb)		Nitrate (ppm)		Conductivity (µS/cm)		Sulfate (ppm)		Total Dissolved Solids (ppm)		Chloride (ppm)		Gross Alpha (pCi/L)	
	MCL = 10		N/A		SMCL = 300		SMCL = 50		MCL = 45		SMCL = 1600		SMCL = 500		SMCL = 1000		SMCL = 500		MCL = 15	
	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX	AVG	MAX
DMW01	20	22	273	485	74	180	20	35	5	56	2085	2640	140	470	1248	1900	610	813	-	-
DMW02	30.6	93	851	2071	73	160	174	260	7	84	4722	6920	803	1300	3388	5100	1222	1824	-	-
DMW03	8	9	508	1050	94	210	77	130	2.7	17.5	3118	6260	658	2250	1938	4710	704	1670	-	-
DMW04	89	100	463	810	442	3250	104	250	3.7	41.9	2568	4160	223	675	1663	2900	730	990	-	-
DMW05	11.7 5	12	150	260	419	1980	30	110	2.3	21	893	1290	257	373	605	830	93	200	-	-
DMW06	36	45	120	230	35	50	43	90	0.8	3.4	688	1150	174	320	537	2754	47	91	-	-
DMW07	11.3	14	91	439	104	280	167	670	0.7	3.4	547	1240	106	336	338	961	48	114	-	-
DMW08	6.6	9	23	37	42	51	6	10	0.8	1.4	308	480	67	119	187	292	26	84	-	-
DMW10A	-	-	246	430	3326	6600	81	160	1.4	3.4	967	1190	273	397	647	920	55	125	-	-
DMW10B	2	2.4	45	73	61	90	0.5	1.6	4.6	24.7	511	664	160	220	328	470	39	52	-	51
DMW11A	-	1	91	280	7153	19000	97	260	0.4	1.1	712	1150	234	470	491	840	46	75	-	-
DMW11B	0.3	0.86	179	490	17226	140000	377	1800	0.8	3.4	919	1320	342	510	600	940	57	83	-	-
DMW12A	15	16	310	2800	533	960	44.3	140	0.8	3.4	1837	8470	265	421	1459	9200	438	3100	-	16
DMW12B	-	0.67	465	1600	352	990	45.5	80	1.11	3.6	2389	6480	257	630	1340	4760	603	2230	-	-

**Notes:**

(-) no results available

Bolded red values indicates results over the respective MCL, SMCL, or NL.

**Table 4: Monitoring Well Depths**

<b>Well</b>	<b>Date Drilled</b>	<b>Slotted Interval (ft)</b>
DMW01	Sep 1991	280 - 300
DMW02	Feb 1992	260 – 300
DMW03	Feb 1992	200 – 220
DMW04	Oct 1991	334 – 374
DMW05	Oct 1991	240 – 310
DMW06	Dec 1993	410 – 440
DMW07	Dec 1993	410 – 440
DMW08	Jan 1993	374 – 404
DMW10A	Jan 1993	370 – 450
DMW10B	Jan 1993	550 – 650
DMW11A	Dec 1992	560 – 660
DMW11B	Dec 1992	370 – 470
DMW12A	Dec 1992	600 – 700
DMW12B	Dec 1992	355 - 455

## APPENDIX B

Table 5: Estimated Annual Sampling Costs

Test	Method	# per Year	\$ per Sample	Extended Price
Title 22 GM/GP/IOC	---	1	250	250
<sup>1</sup> Hexavalent Chromium	218.6	1	30	30
Perchlorate	314.0	2	30	60
<sup>1</sup> Boron	---	1	7	7
N-Nitrosodimethylamine (NDMA)	521	1	264	264
<sup>2</sup> Volatile Organic Compounds	524.2	1	90	90
<sup>2</sup> 1,2,3-trichloropropane	524.2sim	1	80	80
<sup>2</sup> Synthetic Organic Compounds	525.2	1	100	100
<sup>2</sup> EDB/DBCP	504.1	1	50	50
Gross Alpha	900.0	4	50	200
Uranium	---	4	50	200
Radium 226	---	4	195	780
Radium 228	---	4	143	572
Total Organic Carbon	---	4	30	120
Bromide	300.0	4	8	32
Quarterly Iron/Manganese	200.7	3	14.00	42
Quarterly Arsenic	200.8	3	7.00	21
<b>Estimated Annual Sampling Cost Per Well:</b>				<b>\$2,835.00</b>
<b>Extended Price for Sampling 25 Wells on the Recommended Schedule:</b>				<b>\$72,450.00</b>

**Notes:**

<sup>1</sup>If any results are greater than one-half the MCL, sampling should be increased to quarterly

<sup>2</sup>Annual monitoring is required for the first three years of operation

"---" means the analytical method was not specified to the lab

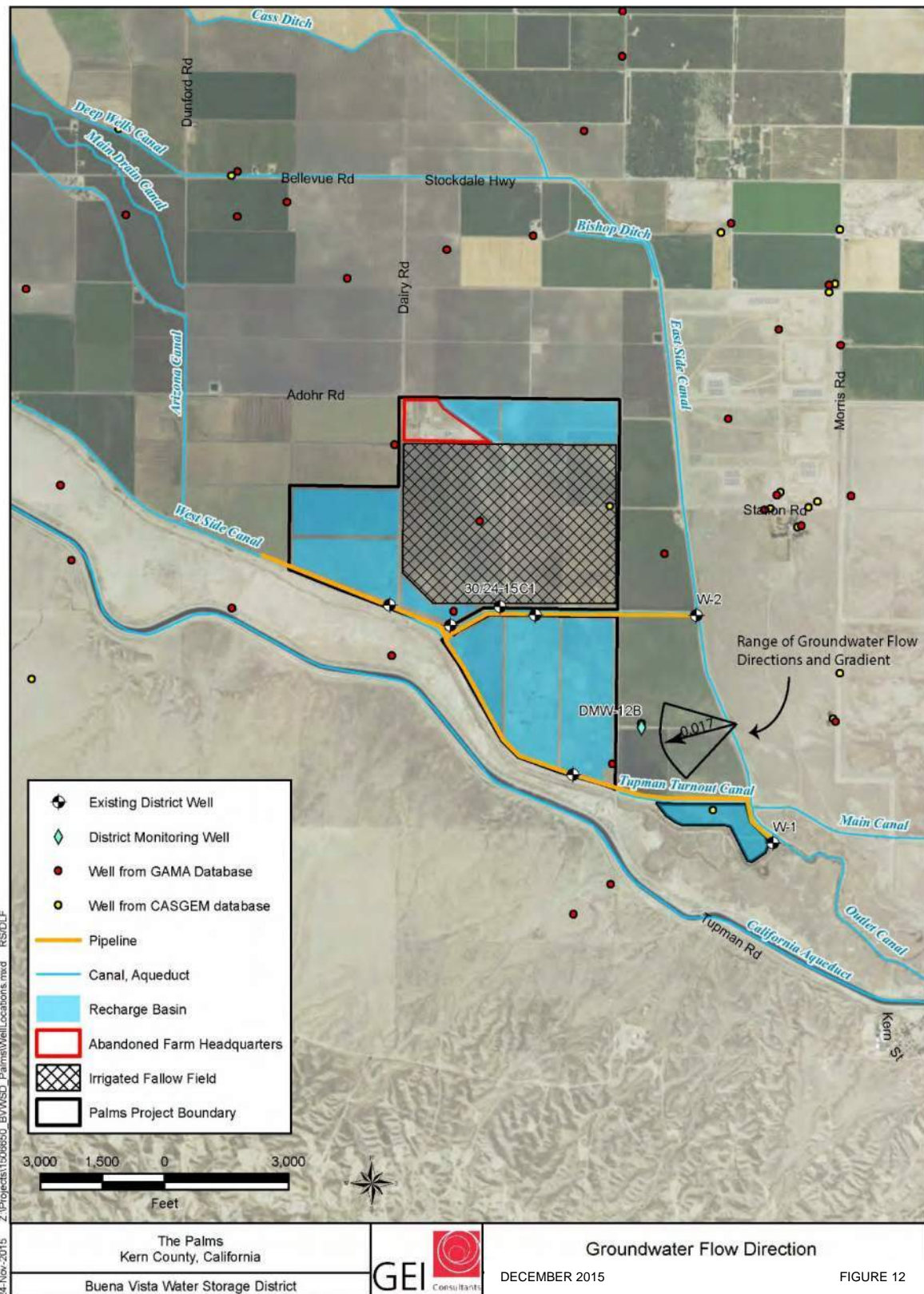


Figure 12: Groundwater Flow Direction 1994- 2013. The average gradient is 0.017 ft vertically/ft horizontally



Wood Environment & Infrastructure Solutions, Inc.  
1281 East Alluvial Avenue, Suite 101  
Fresno, CA 93720-2659  
USA

T: 559-264-2535

[www.woodplc.com](http://www.woodplc.com)

January 15, 2021  
Project 8101

Jonathan Parker  
Kern Water Bank Authority  
1620 Mill Rock Way, Suite 500  
Bakersfield, CA 93311

**Subject: Review of DRAFT EIR for the Palms Groundwater Recovery Project**  
Kern County, California

Dear Mr. Parker:

Wood Environment & Infrastructure Solutions, Inc. (Wood), has prepared this review of the December 2020 *Draft Environmental Impact Report for the Palms Groundwater Recovery Project* (DEIR) prepared by GEI Consultants on behalf of the Buena Vista Water Storage District (BVWSD). The focus of this review is on the numerical modelling effort conducted on behalf of BVWSD by Todd Groundwater (Todd) in support of the DEIR. Specifically, this review evaluates the efficacy of the numerical modelling effort to effectively simulate potential impacts to groundwater related to the proposed Palms Groundwater Recovery Project (Palms Project). As explained below, the Palms Project numerical model was not calibrated to site conditions and is otherwise insufficient in several respects.

## Numerical Modeling Review

The numerical model effort for the Palms Project is presented as a memorandum by Todd in Appendix D of the DEIR. Appendix D presents a summary of the proposed project, regional setting, geology, groundwater conditions (elevations and quality), and the development of a superposition model to evaluate potential groundwater impacts of the Palms Project. The development, validation, and use of the superposition model are discussed in the following sections. Each section contains a summary of the Todd memorandum followed by Wood's opinion on the text in italics.

## Superposition Model Concept

Superposition models rely on Darcy's Law equation for groundwater flow and the principle of superposition. When applied to a groundwater system, the changes in an aquifer system affected by multiple hydraulic stresses (i.e. recharge and pumping) are equal to the sum of the individual hydraulic stresses applied to the aquifer system. Simply put, if Project A causes a 2-foot change in groundwater elevation (head) at some observation point, and Project B causes a 1-foot change in head at the same observation point, then Projects A and B together will result in a 3-foot change in head at the observation point. The results of a superposition modeling are calculated as a change in head, not absolute



groundwater elevations. Therefore, the starting groundwater elevations simulated are irrelevant and can be set to zero. Because the impacts of multiple hydraulic stresses on the aquifer system are additive, only the stresses of the project under evaluation are simulated. The resulting simulated change in head is intended to be a direct reflection of the impacts of the project.

*Inherent in the principal of superposition is that the model used to calculate the change in head is well calibrated to site conditions and can accurately reproduce the observed change in head at known observations points to known hydraulic stresses. Superposition is strictly applicable to linear aquifer system problems only, that is, constant aquifer saturated thickness and linear boundary conditions. If the aquifer system is relatively linear, for example, the saturated thickness does not change by a significant portion, superposition can still provide reasonably accurate answers. If the aquifer system is non-linear (i.e. boundary conditions such as recharge and pumping are highly transient), then superposition models may yield unreliable results. Currently, superposition is used primarily in the simulation of aquifer tests, in that only changes due to the imposed change in stress (that is, the well discharge) are simulated, initial drawdowns are specified as zero, and boundary conditions are relatively constant.*

## **Superposition Model Development**

The superposition model for the Palms Project was developed using United States Geological Survey (USGS) numerical model code MODFLOW. MODFLOW is the defacto standard for numerical groundwater models and has been used world-wide for over 40 years. Development of the Palm Project MODFLOW model is documented in Appendix D, Attachment B.

The Palms Project model was derived from the 2009 USGS Central Valley Hydrologic Model (CVHM), a basin scale model of the entire Central Valley of California. The CVHM simulates the period 1962 through 2003, consists of 10 model layers using a relatively coarse model grid of 1-square mile, and simulates the Central Valley leaky aquifer system from ground surface to the base of fresh groundwater. Significantly, the CVHM does not include the extensive water banking recharge and recovery operations on the Kern River alluvial fan.

The Palms Project model is a subset of the CVHM, extending from slightly north of the Kern County line to the Tehachapi Mountains. In the vicinity of the proposed Palms Project, the model grid was refined from 1-square mile (640 acres) to about 40 acres. In addition, the Palms Project model combined several of the CVHM layer together to yield a 4-layer model. As a result, the hydraulic properties (horizontal and vertical hydraulic conductivity, storage coefficients, and specific yield) had to be averaged and re-districtized to the new Palms Model grid.

*The model developed for the Palms Project is a subset of the CVHM that has been averaged and re-districtized to a refined model grid with fewer model layers. The Palms Project model is essentially a completely new MODFLOW model that should be calibrated to existing site conditions and hydraulic stresses prior to use for predictive simulations.*





## Superposition Model Validation

Following development, the Palms Project MODFLOW model was “validated” to three groundwater scenarios: 1) 2011 West Kern Water District (WKWD) Aquifer Test, 2) WKWD wellfield recovery from October 2012 through December 2014, and 3) Kern Water Bank recharge and recovery from 1993 through 1998 (see Appendix D, Attachment A). These are discussed in the following sections.

*The term “validation” is mis-used here. Model calibration is the iterative process of comparing the model simulated response to a stress with the real aquifer system response to a stress, revising the model if necessary, and comparing again until the model results closely match the real aquifer system response. Model validation is the process of comparing the model and its behavior to the real aquifer system and its behavior to known stresses. Typically, model validation is conducted by taking a calibrated model and testing how well it can reproduce a unique set of stresses and observations that were not used to calibrate the model. For example, say Model A is calibrated to stresses and observed heads for the period 1980 to 2010. If Model A can then simulate the stresses and observed heads for period 2010 to 2020, without any recalibration of model hydraulic parameters, then Model A can be considered validated.*

### Superposition Model Validation Scenario 1

The Palms Project model was “validated” against the results of a 2-dimensional analytical element *WinFlow* model developed in 2009 to simulate a series of 24-hour aquifer pumping tests of five groundwater extraction wells located at the WKWD North Well Field. Observations of the change in head (drawdown) were recorded in up to six nearby monitoring wells during each 24-hour test. The 2009 WKWD *WinFlow* model was calibrated to simulate the drawdown observed at the end of each 24-hour test.

The WKWD *WinFlow* model was modified to simulate the hypothetical pumping of nine wells located around the WKWD North project. Each well was pumped at 2,000 gallons per minute (gpm) for 300 days. The Palms Project model was modified to simulate the same pumping scenario of the WKWD extraction wells. A comparison of the WKWD *WinFlow* model and Palms Project model simulated drawdown showed the Palms Project model under predicted drawdown at the well field. The Palms Project model was then modified (i.e. calibrated) to improve the match to the estimated drawdown by the WKWD *WinFlow* model. The drawdown simulated by the calibrated Palms Project model approximated the WKWD *WinFlow* model simulated drawdown at day 300 of pumping in the vicinity of the pumping wells (near-field), but under predicted drawdown further away from the pumping wells (far-field).

*Numerical models (MODFLOW) are typically compared to an analytical model (WinFlow) to demonstrate that the numerical code can accurately reproduce the analytical solution. This is done using identical model construction (grid, layers) and hydraulic properties so the models are as similar as possible. This was not the case for the Scenario 1 simulations. The WKWD WinFlow model consists of a single uniform layer with homogeneous hydraulic properties. The Palms Project MODFLOW model consists of four layers with heterogenous hydraulic properties. Furthermore, the Palms Project model had to be calibrated to approximate the WKWD WinFlow solution after 300 days of pumping; and did not do so very well. It would be more appropriate to calibrate the Palms Project model to the drawdown observations (actual data) from the 24-hour pumping tests of the WKWD well field which were used to develop the WKWD WinFlow model.*



## **Superposition Model Validation Scenario 2**

The Palms Project model was also “validated” by simulating the recovery pumping of approximately 18,730 acre-feet (AF) of groundwater from five wells in the WKWD wellfield from October 2012 through December 2014. Preliminary simulation results indicated it was necessary to include the recovery pumping of approximately 1.8 million AF (MAF) from the Kern River Alluvial Fan Water Banking Projects (Kern River Projects) during this same period. The Palms Project model simulated drawdown was compared to observed drawdown in 11 observation wells around the WKWD well field. Hydrographs of observed and simulated drawdown showed that the Palms Project model simulated drawdown was more or less on trend with the observed drawdown in the pumping wells but did not reproduce the large changes in head due to well inefficiencies. The observed and simulated drawdown in nearby observation wells shows a poorer fit.

*The need to include the Kern River Projects with the Palms Project model to approximate the observed drawdown in the WKWD well field from 2012 through 2014 demonstrates the underlying assumptions for use of a superposition model are not valid in the Palms Project area. The recharge and recovery operations of the Kern River Projects overwhelm the stresses induced by the recovery from WKWD wells. Furthermore, the Palms Project model did not evaluate the simulated drawdown in the numerous wells on and around the Kern River Projects. These data are readily available and could have made the Palms Project model calibration more robust.*

## **Superposition Model Validation Scenario 3**

The Palms Project model was also “validated” by simulating groundwater mounding associated with the Kern River Projects from 1993 through 1998 when approximately 3.1 MAF of water were recharged. Monthly recharge volumes for each water banking project were imported at the approximate location of the recharge basins. The Palms Project simulated change in head was compared to observed change in head at 26 monitoring wells scattered across the Kern River Projects. Hydrographs of observed and simulated change in head were provided for only for 4 of the 26 wells used for “validation.” The hydrographs show that the Palms Project model simulated change in head is generally on trend with the observed change in head; however, the model over predicts the change in head in the vicinity of the Palms Project and under predicts the change in head near the northern edge of the Kern Water Bank.

*Again, the need to include the Kern River Projects with the Palms Project model to approximate the change in head resulting from the water banking recharge from 1993 to 1998 demonstrates the underlying assumptions for use of a superposition model are not valid in the Palms Project area. The recharge and recovery operations of the Kern River Projects will likely overwhelm the change in head induced by recharge and recovery stresses at the Palms Project. In addition, there is a significant amount of data generated by the Palms Project model (i.e. hydrographs) that were not presented for review. Furthermore, since it became necessary to simulate both recharge and recovery operations of the Kern River Projects, why wasn't a single, comprehensive model prepared simulating the entire history of water banking operations in the area?*

## **Palms Project Recovery Scenarios A and B**

The Palms Project model described above was then utilized to evaluate two hypothetical recharge and recovery scenarios at the Palms Project facility. Both scenarios were assumed to start in 2011, a period



when the Kern River Projects were all recovering groundwater. The Palms Project recovery scenario assumptions are shown below:

- 2011 – 100,00 AF recharge over 8 months
- 2012 – Idle
- 2013 – Year 1 recovery of 25,000 AF over 6 months
- 2014 – Year 2 recovery of 25,000 AF over 6 months
- 2015 – Year 3 recovery of 25,000 AF over 6 months
- 2016 – Year 4 recovery of 25,000 AF over 6 months
- 2017-2020 - Idle

The only difference between Scenario A and B is that Scenario B recovers only 15,000 AF in year four, leaving approximately 10 percent of the recharged water behind. Recovery pumping was assumed to be by 14 wells pumping approximately 2,200 gpm for 6 months. As stated in the Todd memorandum: "Because this is a superposition model, only the combined Palms {recharge} and Recovery Project operations were simulated."

*As clearly shown by "validation" scenarios 2 and 3 described above, it was necessary to add the recharge and recovery operations of the Kern River Projects to the Palms Project model to obtain a reasonable fit to the observed change in heads during recharge and recovery periods. As such, there is no justification to remove the historical water bank recovery operation during the 2011 to 2020 simulation period from the Palm Project model. The Palms Project model simulated mounding during recharge and drawdown during recovery may underestimate mounding (because there was recharge by others during 2011) and underestimate drawdown during recovery (because there was also recovery by others during 2011 to 2019).*

## **Summary and Opinion**

Inherent in the principal of superposition is that the model used to calculate the change in head is well calibrated to site conditions and can accurately reproduce the observed change in head at known observations points to known hydraulic stresses. Superposition is strictly applicable to linear aquifer system problems only, with constant aquifer saturated thickness and linear boundary conditions. Non-linear boundary conditions, such as large-scale recharge and recovery operations, may result in unrealistic simulation results. The Palms Project superposition model derived from the USGS CVHM has a refined grid and fewer layers and utilizes averaged hydraulic properties. As such, the Palms Project model is a completely new model that should have been calibrated to historical site conditions.

The Palms Project model was "validated" by comparing simulated change in heads (drawdown) to drawdown calculated with an analytical *WinFlow* model using a hypothetical pumping scenario. The results did not match well, requiring further calibration of the Palms Project model. Rather than calibrate the Palms Project model to hypothetical drawdown results, the Palms Project model should have been



Mr. Jonathan Parker  
Kern Water Bank Authority  
January 15, 2021  
Page 6

calibrated to the actual observed drawdown during the 24-hour pumping tests used to develop and calibrate the analytical *WinFlow* model.

The Palms Project model could not simulate long-term change in head associated with recovery pumping from the WKWD well field from 2011 to 2014 without adding the recovery operation of the Kern River Projects. Likewise, the Palms Project model could not simulate the long-term change in head associated with recharge operation from 1993 to 1998 without adding the recharge operation of the Kern River Projects. This demonstrates that the boundary conditions are non-linear, and simulation results are dependent on activities located away from the Palms Project site. The Palms Project model needs to include and be calibrated to the nearby recharge and recovery operations of the Kern River Projects.

It has been a pleasure to be of professional service to you. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

**Wood Environment & Infrastructure Solutions, Inc.**



David M. Bean, PG, CHG  
Principal Hydrogeologist

I:\8000s\8101.000\Archive\8101.005.docx

(Submitted Electronically)



**MEMORANDUM OF UNDERSTANDING**

**REGARDING OPERATION AND MONITORING  
OF THE  
BUENA VISTA WATER STORAGE DISTRICT  
GROUNDWATER BANKING PROGRAM**

This Memorandum of Understanding is entered into the Effective Date hereof by and among BUENA VISTA WATER STORAGE DISTRICT, hereinafter referred to as "Buena Vista", and SEMITROPIC WATER STORAGE DISTRICT, HENRY MILLER WATER DISTRICT, KERN COUNTY WATER AGENCY, KERN DELTA WATER DISTRICT, KERN WATER BANK AUTHORITY, ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, and WEST KERN WATER DISTRICT, collectively referred to as "Adjoining Entities."

**RECITALS**

**WHEREAS**, Buena Vista expects that certain real property more particularly shown on the map attached hereto as Exhibit A and incorporated herein by this reference ("Project Site"), or portions thereof, will be used in connection with the Project; and

**WHEREAS**, Buena Vista intends to develop and improve the Project Site as necessary to permit the importation, percolation and storage of water in underground aquifers for later recovery, transportation and use for the benefit of Buena Vista, all as more fully described in Exhibit B attached hereto and incorporated herein by this reference ("Project"); and

**WHEREAS**, Adjoining Entities encompass lands and/or operate existing projects lying adjacent to the Project Site as shown on said Exhibit A; and

**WHEREAS**, in recent years, water banking, recovery and transfer programs in Kern County have become increasingly numerous and complex; and

**WHEREAS**, it is appropriate and desirable to mitigate or eliminate any short-term and long-term significant adverse impacts of new programs upon potentially affected projects and landowners within the boundaries of Adjoining Entities; and

**WHEREAS**, Adjoining Entities and Buena Vista desire that the design, operation and monitoring of the Project be conducted and coordinated in a manner to insure that the beneficial effects of the Project to Buena Vista are maximized but that the Project does not result in significant adverse impacts to water levels, water quality or land subsidence within the boundaries of Adjoining Entities, or otherwise interfere with the existing and ongoing programs of Adjoining Entities; and

**WHEREAS**, on October 26, 1995, the Kern Water Bank Authority and its Member Entities, as the "Project Participants," and Buena Vista Water Storage District, Rosedale-Rio Bravo Water Storage District, Kern Delta Water District, Henry Miller Water District and West Kern Water District, as the "Adjoining Entities," entered into a Memorandum of Understanding, similar to this Memorandum of Understanding, which provided among other things at Paragraph 8 that for "any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU," and by entering into this MOU the Adjoining Entities find that this MOU satisfies such requirement for the Project; and

**WHEREAS**, Buena Vista intends to operate its Project such that the same does not cause or contribute to overdraft of the groundwater basin; and



**WHEREAS**, in connection with its environmental review for the Project, Buena Vista commissioned a hydrologic balance study for the period 1962 - 2000, which study shows that the District is not currently operating in a state of overdraft, and, further, Buena Vista has projected said hydrologic balance study into the future, assuming completion of the Project, and said projection demonstrates that the District is not expected to operate in state of overdraft following implementation of the Project which studies have not been independently verified by the Adjoining Entities; and

**WHEREAS**, in the hydrologic balance studies conducted by Buena Vista in connection with the Project, the annual safe yield from the groundwater basin is assumed to be .3 acre-feet per acre times the gross developed acres in the District and no assumption is included with respect to groundwater inflow or outflow; and

**WHEREAS**, this MOU affects banking programs operated directly or indirectly for the benefit of third parties involving, (1) construction of new facilities or (2) direct or indirect sale of stored groundwater by Buena Vista, as more particularly described in Exhibit B.

**NOW, THEREFORE, BE IT RESOLVED** that, based upon the mutual covenants contained herein, the parties hereto agree as follows:

1. Project Description and Construction. Buena Vista has completed a preliminary Project Description described in Exhibit B hereto representing the contemplated facilities for the Project. Said preliminary description has been reviewed by the parties hereto except, however, the Adjoining Entities have not reviewed, approved or agreed to any wells located outside the existing District boundary. The

foregoing shall not be interpreted to imply consent to any aspect of any future project not described in the Environmental Impact Report, certified October 11, 2002, for the Buena Vista/Rosedale Rio Bravo Water Banking and Recovery Program. Buena Vista will construct the Project consistent with such preliminary description. Any major modifications of the facilities and/or significant changes from that described in Exhibit B and in the environmental documentation for the Project will be subject to additional environmental review pursuant to CEQA and will be subject to review of the Monitoring Committee prior to implementation.

2. Project Operation. The Project shall be operated to achieve the maximum water storage and withdrawal benefits for Buena Vista consistent with avoiding, mitigating or eliminating to the greatest extent practicable, significant adverse impacts resulting from the Project. To that end, the Project shall be operated in accordance with the following Project Objectives and Minimum Operating Criteria:

a. Project Objectives. Consistent with the Project description, Buena Vista will make a good faith effort to meet the following objectives, which may or may not be met:

(1) The parties should operate their projects in such manner as to maintain and, when possible, enhance the quality of groundwater within the Project Site and the Kern Fan Area as shown in Exhibit C.

(2) If supplies of acceptable recharge water exceed recharge capacity, all other things being equal, recharge priority should be given to the purest or best quality water.

(3) Each project within the Kern Fan Area should be operated with the objective that the average concentration of total dissolved salts in the recovered water will exceed the average concentration of total dissolved salts in the recharged water, at a minimum, by a percentage equal to or greater than the percentage of surface recharge losses. The average shall be calculated from the start of each project.

(4) To maintain or improve groundwater quality, recovery operations should extract poorer quality groundwater where practicable. Blending may be used to increase recovery of lesser quality groundwater unless doing so will exacerbate problems by generating unfavorable movement of lesser quality groundwater. It is recognized that the extent to which blending can help to resolve groundwater quality problems is limited by regulatory agency rules regarding discharges into conveyance systems used for municipal supplies, which may be changed from time to time.

(5) All groundwater pumpers should attempt to control the migration of poor quality water. Extensive monitoring will be used to identify the migration of poor quality water and give advance notice of developing problems. Problem areas may be dealt with by actions including, but not limited to:

(a) limiting or terminating extractions that tend to draw lesser quality water toward or into the usable water areas;

(b) increasing extractions in areas that might generate a beneficial, reverse gradient;

(c) increasing recharge within the usable water area to promote favorable groundwater gradients.

(6) It is intended that all recovery of recharged water be subject to the so-called "golden rule." In the context of a banking project, the "golden rule" means that, unless acceptable mitigation is provided, the banker may not operate so as to create conditions that are worse than would have prevailed absent the project giving due recognition to the benefits that may result from the project, all as more fully described at paragraph 2(b)12 below.

(7) The Project shall be developed and operated so as to prevent, eliminate or mitigate significant adverse impacts. Thus, the Project shall incorporate mitigation measures as necessary. Mitigation measures to prevent significant adverse impacts from occurring include but are not limited to the following: (i) spread out recovery area; (ii) provide buffer areas between recovery wells and neighboring overlying users; (iii) limit the monthly, seasonal, and/or annual recovery rate; (iv) provide sufficient recovery wells to allow rotation of recovery wells or the use of alternate wells; (v) provide adequate well spacing; (vi) adjust pumping rates or terminate pumping to reduce impacts, if necessary; (vii) impose time restrictions between recharge and recovery to allow for downward percolation of water to the aquifer; and (viii) provide recharge of water that would otherwise not recharge the Kern Fan Basin. Mitigation measures that compensate for unavoidable adverse impacts include but are not limited to the following: (i) with the consent of the affected groundwater pumper, lower the pump bowls or deepen wells as necessary to restore

groundwater extraction capability to such pumper; (ii) with the consent of the affected groundwater pumper, provide alternative water supplies to such pumper; and (iii) with the consent of the affected groundwater pumper, provide financial compensation to such pumper.

b. Minimum Operating Criteria.

(1) The Monitoring Committee shall be notified prior to the recharge of potentially unacceptable water, such as "produced water" from oilfield operations, reclaimed water, or the like. The Monitoring Committee shall review the proposed recharge and make recommendations respecting the same as it deems appropriate. Where approval by the Regional Water Quality Control Board is required, the issuance of such approval by said Board shall satisfy this requirement.

(2) Recharge may not occur in, on or near contaminated areas, nor may anyone spread in, on or near an adjoining area if the effect will be to mound water near enough to the contaminated area that the contaminants will be picked up and carried into the uncontaminated groundwater supply. When contaminated areas are identified within or adjacent to the Project, Buena Vista shall also:

(a) participate with other groundwater pumpers to investigate the source of the contamination;

(b) work with appropriate authorities to ensure that the entity or individual, if any, responsible for the contamination meets its responsibilities to remove the contamination and thereby return the Project Site to its full recharge and storage capacity;

(c) operate the Project in cooperation with other groundwater pumpers to attempt to eliminate the migration of contaminated water toward or into usable water quality areas.

(3) Operators of projects within the Kern Fan Area will avoid operating such projects in a fashion so as to significantly diminish the natural, normal and unavoidable recharge of water native to the Kern Fan Area as it existed in pre-project condition. If and to the extent this occurs as determined by the Monitoring Committee, the parties will cooperate to provide equivalent recharge capacity to offset such impact.

(4) The mitigation credit referenced in 2.b(12) for fallowed Project land shall be .3 acre-feet per acre per year times the amount of fallowed land included in the Project Site in the year of calculation.

(5) The District Lands shown in Exhibit A may be utilized for any purpose provided, however, the use of said property shall not cause or contribute to overdraft of the groundwater basin.

(6) Each device proposed to measure recharge water to be subsequently recovered and/or recovery of such water will be initially evaluated and periodically reviewed by the Monitoring Committee. Each measuring device shall be properly installed, calibrated, rated, monitored and maintained by and at the expense of the owner of the measuring device.

(7) It shall be the responsibility of the user to insure that all measuring devices are accurate and that the measurements are provided to the

Monitoring Committee at the time and in the manner required by the Monitoring Committee.

(8) A producer's flow deposited into another facility, such as a transportation canal, shall be measured into such facility by the operator thereof and the measurement reported to the Monitoring Committee at the time and in the manner required by such Monitoring Committee.

(9) The Monitoring Committee or its designee will maintain official records of recharge and recovery activities, which records shall be open and available to the public. The Monitoring Committee will have the right to verify the accuracy of reported information by inspection, observation or access to user records (i.e., P.G.&E. bills). The Monitoring Committee will publish or cause to be published annual reports of operations.

(10) Losses shall be assessed as follows:

(a) Surface recharge losses shall be fixed and assessed at a rate of 6% of water diverted for direct recharge.

(b) To account for all other actual or potential losses (including migration losses), a rate of 4% of water placed in a bank account (including District accounts when designated for potential sale) shall be deducted to the extent that Buena Vista has been compensated within three (3) years following the end of the calendar year in which the water was designated as banked at the SWP Delta Water Rate charged by DWR at the time of payment; provided further, however, that the water



purchased and subtracted from a groundwater bank account pursuant to this provision shall only be used for overdraft correction within the district purchasing the water.

(c) An additional 5% loss shall be assessed against any water diverted to the Project Site for banking by, for, or on behalf of any out-of-County person, entity or organization and/or against any banked water sold or transferred to any out-of-County person, entity or organization (except current SWP Agricultural Contractors).

(d) All losses provided for herein represent amounts of water that are non-bankable and non-recoverable by Buena Vista.

(11) Recovery of banked water shall be from the Project Site and recovery facilities shall be located therein. Recovery from outside the Project Site may be allowed with the consent of the District or entity having jurisdiction over the area from which the recovery will occur and upon review by the Monitoring Committee.

(12) Recovery of banked water may not be allowed if not otherwise mitigated if it will result in significant adverse impacts to surrounding overlying users. "Adverse impacts" will be evaluated using data applicable in zones including the area which may be affected by the Project of approximately five miles in width from the boundaries of the Project as designated by the Monitoring Committee. In determining "adverse impacts," as provided at this paragraph and elsewhere in this MOU, consideration will be given to the benefits accrued over time during operation of the Project to landowners surrounding the Project Site including higher groundwater levels as a result of operation of the Project. In determining non-Project conditions vs. Project

conditions, credit toward mitigation of any otherwise adverse impacts shall be recognized to the extent of the 4% loss and 5% losses recognized under paragraphs 2.b.(10)(b) and (c), for the mitigation credit recognized under paragraph 2.b.(4), if any, and to the extent of recharge on the Project Site for overdraft correction.

(13) To the extent that interference, other than insignificant interference, with the pumping lift of any existing active well as compared to non-Project conditions, is attributable to pumping of any wells on the Project Site, Buena Vista will either stop pumping as necessary to mitigate the interference or compensate the owner for such interference, or any combination thereof. The Monitoring Committee will establish the criteria necessary to determine if well interference, other than insignificant interference, is attributable to pumping of Project wells by conducting pumping tests of Project wells following the installation of monitoring wells (if not already completed) and considering hydrogeologic information.

(14) The Kern Fan Element Groundwater Model, with input from Buena Vista and the Adjoining Entities, and utilizing data from a comprehensive groundwater monitoring program, may be used by the Monitoring Committee as appropriate to estimate groundwater impacts of the Project.

(15) The Project shall be operated with a positive balance, i.e., there shall be no "borrowing" of water for recovery from the basin.

3. Project Monitoring. Adjoining Entities agree to participate in a comprehensive monitoring program and as members of a Monitoring Committee, as hereinafter more particularly described, in order to reasonably determine groundwater

level and water quality information under Project and non-Project conditions. The monitoring program will more particularly require the following:

a. Monitoring Committee: Buena Vista and the Adjoining Entities shall form a Monitoring Committee for the Project upon terms and conditions acceptable to the participants. The Monitoring Committee shall:

- (1) Engage the services of a suitable independent professional groundwater specialist who shall, at the direction of the Committee, provide assistance in the performance of the tasks identified below;
- (2) Meet and confer monthly or at other intervals deemed to be appropriate in furtherance of the monitoring program;
- (3) Establish a groundwater evaluation methodology or methodologies;
- (4) Prepare a monitoring plan and two associated maps, "Well Location, Water Quality Network," and "Well Location, Water Level Network," which plan and maps depict the location and types of wells anticipated to be used in the initial phase of groundwater monitoring (said plan and maps are expected to be modified from time to time as the monitoring program is developed and operated);
- (5) Specify such additional monitoring wells and ancillary equipment as are deemed to be necessary or desirable for the purposes hereof;
- (6) Prepare annual water balance studies and other interpretive studies, which will designate all sources of water and the use thereof within the study area;

(7) Develop criteria for determining whether excessive mounding or withdrawal is occurring or is likely to occur in an area of interest;

(8) Annually or as otherwise needed determine the impacts of the Project on each of the Adjoining Entities by evaluating with and without Project conditions; and

(9) Develop procedures, review data, and recommend Project operational criteria for the purpose of identifying, verifying, avoiding, eliminating or mitigating, to the extent practicable, the creation of significant imbalances or significant adverse impacts.

b. Collection and Sharing of Data. The Adjoining Entities will make available to the Monitoring Committee copies of all relevant groundwater level, groundwater quality, and other monitoring data currently collected and prepared by each. Buena Vista shall annually report, by areas of interest, water deliveries for banking and other purposes, groundwater withdrawals from bank accounts, transfers and other changes in account balances.

c. Monitoring Costs.

(1) The cost of constructing any necessary monitoring wells and ancillary equipment within Buena Vista shall be borne by Buena Vista. The cost of any new or additional monitoring wells and ancillary equipment outside of the boundaries of Buena Vista shall be borne as may be determined by separate agreement of Buena Vista and Adjoining Entities.

(2) Each of the parties shall be responsible for the personnel costs of its representative on the Monitoring Committee. In addition, the Adjoining Entities shall be responsible for all costs of monitoring operations and facilities within their respective boundaries and Buena Vista shall be responsible for all costs of monitoring operations and facilities within the Project Site.

(3) All other groundwater monitoring costs, including employment of the professional groundwater specialist, collection, evaluation and analyses of data as adopted by the Monitoring Committee, shall be allocated among and borne by the parties as they shall agree among themselves. Cost sharing among Adjoining Entities shall be as agreed by them. Any additional monitoring costs shall be determined and allocated by separate agreement of those parties requesting such additional monitoring.

4. Modification of Project Operations. The Monitoring Committee may make recommendations to Buena Vista, including without limitation recommendations for modifications in Project operations based upon evaluation(s) of data which indicate that excessive mounding or withdrawal is occurring or is likely to occur in an area of interest. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner.

5. Dispute Resolution.

a. Submission to Monitoring Committee. All disputes regarding the operation of the Project or the application of this MOU, or any provision hereof, shall first be submitted to the Monitoring Committee for review and analysis. The Monitoring

Committee shall meet and review all relevant data and facts regarding the dispute and, if possible, recommend a fair and equitable resolution of the dispute. The Monitoring Committee and its members shall not act in an arbitrary, capricious or unreasonable manner. In the event that (1) the Monitoring Committee fails to act as herein provided, (2) any party disputes the Monitoring Committee's recommended resolution or (3) any party fails to implement the Monitoring Committee's recommended resolution within the time allowed, any party to this MOU may seek any legal or equitable remedy available as hereinafter provided.

b. Arbitration. If all of the parties agree that a factual dispute exists regarding any recommendation of the Monitoring Committee made pursuant hereto, or implementation thereof, such dispute shall, be submitted to binding arbitration before a single neutral arbitrator appointed by unanimous consent and, in the absence of such consent, appointed by the presiding judge of the Kern County Superior Court. The neutral arbitrator shall be a registered civil engineer or a registered geologist or other person acceptable to the Parties, preferably with a background in groundwater hydrology. The arbitration shall be called and conducted in accordance with such rules as the contestants shall agree upon, and, in the absence of such agreement, in accordance with the procedures set forth in California Code of Civil Procedure section 1282, et seq. Any other dispute may be pursued through a court of competent jurisdiction as otherwise provided by law.

c. Burden of Proof. In the event of arbitration or litigation under this MOU, all parties shall enjoy the benefit of such presumptions as are provided by law

but, in the absence thereof, neither party shall bear the burden of proof on any contested legal or factual issue.

d. Landowner Remedies. Nothing in this MOU shall prevent any landowner within the boundaries of any party from pursuing any remedy at law or in equity in the event such landowner is damaged as a result of projects within the Kern Fan Area.

6. Term. The Effective Date of this MOU shall be January 1, 2003 regardless of the date of actual execution. This MOU shall continue in force and effect from and after the Effective Date until terminated by (1) operation of law, (2) unanimous consent of the parties, or (3) abandonment of the Project and a determination by the Monitoring Committee that all adverse impacts have been fully eliminated or mitigated as provided in this MOU.

7. Complete Agreement/Incorporation Into Banking Agreements. This MOU constitutes the whole and complete agreement of the parties regarding Project operation, maintenance and monitoring. Buena Vista shall incorporate this MOU by reference into any further agreement it enters into respecting banking of water in or withdrawal of water from the Project Site.

8. Future Projects. With respect to any future project within the Kern Fan Area, the Parties hereto shall use good faith efforts to negotiate an agreement substantially similar in substance to this MOU.



9. Notice Clause. All notices required by this MOU shall be sent via first class United States mail to the following and shall be deemed delivered three days after deposited in the mail:

Buena Vista: Buena Vista Water Storage District (Martin Milobar)  
P. O. Box 756  
Buttonwillow, CA 93206

Adjoining Entities: Kern County Water Agency (Tom Clark)  
P. O. Box 58  
Bakersfield, CA 93301-0058

Kern Delta Water District (Mark Mulkey)  
501 Taft Highway  
Bakersfield, CA 93307-6247

Semitropic Water Storage District (Wil Boschman)  
P. O. Box Z  
Wasco, CA 93280-0877

Henry Miller Water District (Joe Lutje)  
P. O. Box 9759  
Bakersfield, CA 93389-9759

Kern Water Bank Authority (Bill Phillimore)  
P. O. Box 80607  
Bakersfield, CA 93380-0607

Rosedale-Rio Bravo Water Storage District (Hal Crossley)  
P. O. Box 867  
Bakersfield, CA 93302-0867

West Kern Water District (Jerry Pearson)  
P.O. Box ~~MM~~ 1105  
Taft, CA 93268-~~2735~~ 1105

Notice of changes in the representative or address of a party shall be given in the same manner.

10. California Law Clause. All provisions of this MOU and all rights and obligations of the parties hereto shall be interpreted and construed according to the laws of the State of California.

11. Amendments. This MOU may be amended by written instrument executed by all of the parties. In addition, recognizing that the parties may not now be able to contemplate all the implications of the Project, the parties agree that on the tenth anniversary of implementation of the Project, if facts and conditions not envisioned at the time of entering into this MOU are present, the parties will negotiate in good faith amendments to this MOU. If the parties cannot agree on whether conditions have changed necessitating an amendment and/or upon appropriate amendments to the MOU, such limited issues shall be submitted to an arbitrator or court, as the case may be, as provided above.

12. Successors and Assigns. This MOU shall bind and inure to the benefit of the successors and assigns of the parties.

13. Severability. The rights and privileges set forth in this MOU are severable and the failure or invalidity of any particular provision of this MOU shall not invalidate the other provisions of this MOU; rather all other provisions of this MOU shall continue and remain in full force and effect notwithstanding such partial failure or invalidity.

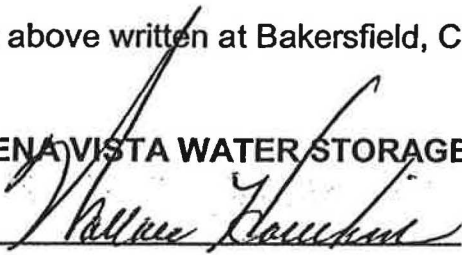
14. Force Majeure. All obligations of the parties shall be suspended for so long as and to the extent the performance thereof is prevented, directly or indirectly, by earthquakes, fires, tornadoes, facility failures, floods, drownings, strikes, other casualties, acts of God, orders of court or governmental 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, or its officers, agents or employees, for any damage arising out of or connected with a suspension of performance pursuant to this paragraph.

15. Counterparts. This MOU, 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. In proving this MOU 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.

**IN WITNESS WHEREOF** the parties have executed this MOU the day and year first above written at Bakersfield, California.

**BUENA VISTA WATER STORAGE DISTRICT**

By: 

By: \_\_\_\_\_

**SEMITROPIC WATER STORAGE DISTRICT**

By: 

By: 

**HENRY MILLER WATER DISTRICT**

By: Joe Lutje

By: JOE Lutje

**KERN COUNTY WATER AGENCY**

By: William Mathews

By: \_\_\_\_\_

**KERN DELTA WATER DISTRICT**

By: L. Mark Mulkey

By: L. Mark Mulkey

**KERN WATER BANK AUTHORITY**

By: William Phillipine

By: William Phillipine

**ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT**

BY: Hal Crossley

BY: Hal Crossley

**WEST KERN WATER DISTRICT**

BY: \_\_\_\_\_

BY: \_\_\_\_\_

**HENRY MILLER WATER DISTRICT**

By: \_\_\_\_\_

By: \_\_\_\_\_

**KERN COUNTY WATER AGENCY**

By: \_\_\_\_\_

By: \_\_\_\_\_

**KERN WATER BANK AUTHORITY**

By: \_\_\_\_\_


By: \_\_\_\_\_

**ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT**

BY: \_\_\_\_\_

BY: \_\_\_\_\_

**WEST KERN WATER DISTRICT**

BY:  \_\_\_\_\_

BY:  \_\_\_\_\_

**REQUIRED ATTACHMENTS:**

- EXHIBIT A:           MAP OF DISTRICT**
- EXHIBIT B:           NARRATIVE DESCRIPTION OF PROJECT FACILITIES**
- EXHIBIT C:           MAP OF KERN FAN AREA**

berking MOU.wpd





## PROJECT DESCRIPTION

### Purposes

The primary water management objective of Buena Vista Water Storage District (Buena Vista) is to enhance water supplies for its landowners. Under the project, surface water will be stored in aquifers during times of surplus and recovered when needed either through district or landowner wells. Through its ongoing conjunctive use program, the District has stored, and will continue to store more water that can be beneficially used by its landowners. The new project involves the continuation and expansion of the conjunctive use program and the sale of a portion of its stored water that is surplus to its long-term needs.

### Sources of Water

Kern River water, being Buena Vista WSD's primary supply water right, as well as other sources will be recharged. Such sources include: the Kern River, Friant-Kern, SWP, CVP, flood water and other sources that may be available from time to time.

Buena Vista has assessed its water needs for irrigation, its available water sources, and the amount of direct and in-lieu recharge that can occur effectively (i.e. be recovered and still be consistent with this MOU). It has concluded that at least 30,000 acre feet, as a long term average, is effective recharge that is surplus to its needs and can be recovered either directly, or through exchange of Buena Vista's SWP entitlement. Therefore, Buena Vista plans to sell a portion of its surplus water inside and/or outside the county.

### Facilities

Buena Vista has historically recharged water on Project Lands as shown on Exhibit A. Recharge has also occurred through the delivery of surface water to landowners who would otherwise pump groundwater on "District Lands" and "Recovery/Recharge Lands" outside the District's boundaries. These activities will continue and may be expanded.

Of the approximately 50,000 acres that presently constitute Buena Vista "District Lands", all may be used for in-lieu recharge and some areas are suitable for direct recharge. In addition, the "Recharge Lands" and "Recovery/Recharge Lands" identified on Exhibit A may also be used for in-lieu and direct recharge.

It is proposed that water would be conveyed to and from project facilities using available capacity in any of the canals and conveyance facilities that may serve the Project including: the Cross Valley Canal, the River Canal, the Kern River, the Friant Kern Canal, the California Aqueduct, the Alejandro Canal, and the Main Canal/KWB Canal. Additional conveyance facilities may be constructed as future projects are developed.

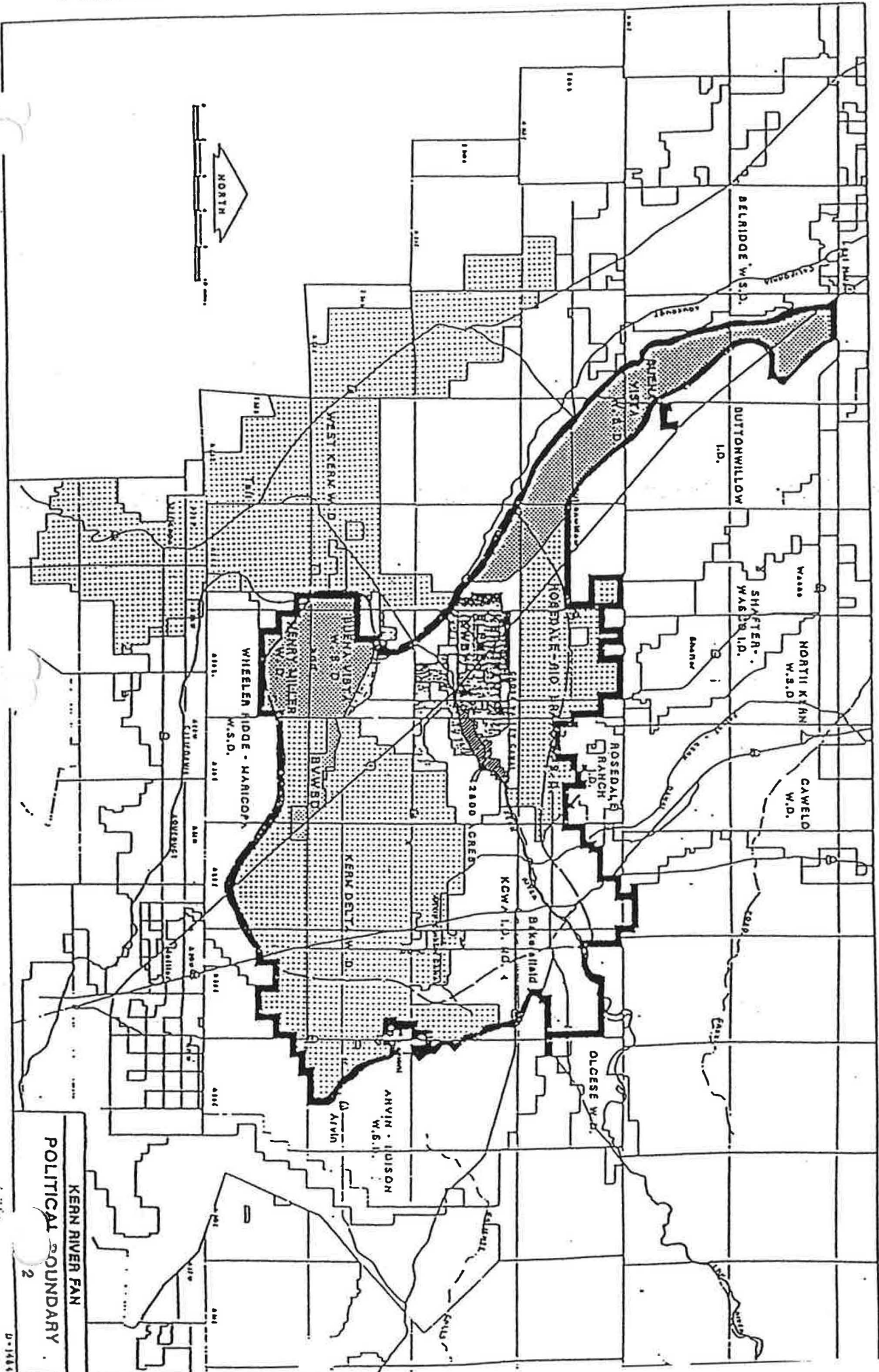
Buena Vista may construct additional recharge ponds, water conveyance facilities, and water wells. Currently the District has four District owned wells within the Buttonwillow service area. According to a 2000 survey, there are approximately 200 landowner wells. Another 20 District owned wells may be added within the "District Lands" and "Recovery/Recharge Lands" as shown on Exhibit A before the project is complete to provide adequate recovery capacity and the necessary operational flexibility to avoid or minimize adverse impacts. District/Landowner programs may include the use of landowner wells by District-wide reduction in surface supply allocations or by individual volunteer well lease programs. Once build out of the recovery facilities is complete, the recovery capacity will be maintained by constructing new wells to replace the capacity of older wells as they fail. New District owned wells shall be placed no

closer than one-third mile from any functioning wells outside the project boundaries. Project wells shall be located and operated so as to prevent significant non-mitigable adverse impacts to neighboring landowners.

**Operation**

The project shall be managed by the Buena Vista Water Storage District. Day-to-day operation of portions of the project may be contracted to other parties. Operation of the project shall be coordinated with adjoining projects.

Buena Vista has historically managed its groundwater and surface supplies to protect water users within the District and assure an affordable water supply of sufficient quality and quantity to meet future needs. This Project will not alter that mission. The District will maintain a groundwater storage account considered adequate to ensure that the District will have sufficient water in storage to meet its continuing in-district needs.



**Initial Study and  
Proposed Mitigated Negative Declaration  
for  
Buena Vista Water Storage District, Palms Groundwater Banking Project**

**Lead Agency: Buena Vista Water Storage District**

**For additional information  
regarding this document contact:**

Maurice Etchechury, Engineer-Manager  
Buena Vista Water Storage District  
525 North Main Street  
P.O. Box 756  
Buttonwillow, CA 93206  
Phone: 661-324-1101

December 2015

# Table of Contents

<b>Section A. Environmental Checklist</b>	<b>2</b>
<b>Section B. Environmental Factors Potentially Affected</b>	<b>9</b>
<b>Section C. References</b>	<b>34</b>
<b>Section D. Technical Memos and Reports</b>	<b>36</b>
<b>Section E. Mitigation Measures</b>	<b>37</b>
<b>Section F. List of Preparers</b>	<b>44</b>

## List of Figures

Figure 1: Project Location .....	7
Figure 2: Proposed Palms Groundwater Banking Project.....	8
Figure 3: Typical View Shed in the Project Area .....	11

# Section A. Environmental Checklist

---

**1. Project title:**

Buena Vista Water Storage District, Palms Groundwater Banking Project

**2. Lead Agency/Project Sponsor:**

Buena Vista Water Storage District  
525 North Main Street  
P.O. Box 756  
Buttonwillow, CA 93206

**3. Contact person and phone number:**

Maurice Etchechury      661-324-1101

**4. Project location:**

The project area is located within the Buena Vista Water Storage District (BVWSD), in the southern portion of the Buttonwillow Service Area, north of the California Aqueduct, south of Adohr Road, and west of the Tule Elk Reserve (Figure 1).

**5. General plan designation:**

NA

**6. Zoning:**

Exclusive Agriculture (A)

**7. Description of project: (Describe the whole action involved, including but not limited to, later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)**

The Palms Groundwater Banking Project (Palms Project) is a groundwater replenishment and water banking project that will cover approximately 1,160 acres and will include features needed to apply surface water for groundwater recharge as well as facilities needed for recovery and treatment of stored groundwater (Figure 2). The Palms Project construction would include activities consistent with digging, trenching, and excavation of soil to create water holding ponds and channels, and the installation new pipeline and wells for later recovery. The Project involves multiple stages: 1) construction of recharge facilities, 2) installation of pumps in existing wells and approximately 4 miles of pipeline, 3) construction and equipping additional recovery wells with associated piping, and 4) water treatment facilities if needed. Stages 3 and 4 primarily involve the recovery aspect and would be constructed at a later date. Construction of stages 1 and 2 would include activities consistent with digging, trenching, and excavation of soil to create water holding ponds and channels,

and the installation new pipeline. Linear trenches would be excavated around the perimeter of the water holding facilities to install approximately 16,500 feet of 24-inch-diameter pipe and another 5,000 feet of 36-inch pipe to convey water recovered from the Palms project area (Figure 2).

High quality water recharged by the Project will flow to aquifers that are sources for domestic and municipal wells providing water to residents of Taft, Tupman, and to the disadvantaged community of Buttonwillow, and to replenish groundwater under the Tule Elk Reserve.

Lands to be used by the Project have an established history of irrigated crop production. Retiring these lands from irrigated agriculture will enable water to be delivered to the area based on availability of water for recharge rather than in response to the pattern of crop demand. Therefore, the timing of the deliveries will differ in a way that results in important benefits to the Buttonwillow Sub-basin.

The District anticipates that removing irrigated land from production and converting this land to recharge facilities will reduce irrigation demand by approximately 3,300 acre-feet per year. While cessation of irrigation deliveries will eliminate deep percolation of irrigation water, the intentional recharge of high quality water will more than compensate for the reduction in deep percolation and will greatly reduce the potential of leaching of nitrates, salts and other contaminants.

Earthwork would include construction of low berms with material for these berms being generated on-site by removal of surface soil that overlies shallow, highly permeable river-borne sand deposits. Recharge would be encouraged by retaining water in the canals and natural channels which run through the Palms Project area.

Construction activity for recharge facilities would be completed within 6 months, while construction of recovery facilities would occur based on the rate of recovery and level of treatment needed to meet local needs and to fulfill banking agreements.

### **Project Objectives**

The Project will have the following primary objectives:

- Increase conjunctive management on the west side of Kern County by expanding the area's ability to accept surface water for groundwater recharge during periods when surface water is available. Groundwater stored by the Project will be available to meet demands during periods when supply of surface water is limited.
- Reduce agricultural demand by replacing 1,160 acres of irrigated farmland with spreading grounds.
- Raise groundwater elevations in the Project area. Groundwater elevations will fluctuate between wet periods, when recharge raises groundwater elevations, and dry



periods, when elevations drop due to groundwater recovery. However, “The Palms” will be managed so that groundwater elevations will improve from those observed historically and anticipated based on groundwater modeling without the project. However, the amplitude of changes between wet periods and dry periods may increase.

### **Project Benefits**

Project benefits will fall into following three primary categories: 1) benefits to groundwater users and prospective banking partners due to better management of groundwater elevations, 2) habitat benefits as a result of more availability for water transfers to the Tule Elk Reserve, and 3) water quality improvements due to reduced leaching of contaminants to groundwater. These benefits are described in greater detail below.

1) Water supply and energy savings will result from a general increase in groundwater elevations in the Project area. Although “The Palms” will function as a banking project with groundwater levels increasing during periods when water is recharged and declining when groundwater is pumped to meet local demands or for delivery to agricultural users, the Project will be operated so that it will provide a long term benefit to the basin. This will aid in regional compliance with the Sustainable Groundwater Management Act and will enable groundwater pumpers (both Project proponents and local domestic and municipal users) to reduce pumping costs and lessen the need to deepen wells.

2) Local habitat benefits in stream channels and wetlands will result from increased base flow in regional streams generated by greater water availability, particularly in the vicinity of the Tule Elk Reserve. Also the spreading ponds will act as a type of wetlands, as they will likely be operated during times of migratory bird flights.

3) In addition to aiding in management of groundwater elevations, the retirement of irrigated lands and construction of spreading grounds will reduce nitrates now conveyed to groundwater from deep percolation of irrigation applications. This will be accomplished by eliminating the application of nitrogen and other fertilizers. The resulting improvements in groundwater quality will benefit all groundwater users, particularly local users.

### **8. Surrounding land uses and setting:**

The BVWSD lies in the trough of California’s southern San Joaquin Valley, approximately 16 miles west of the City of Bakersfield. Aside from the small unincorporated towns of Buttonwillow and Tupman, there are no other population centers within the BVWSD. The BVWSD’s Service Area comprises approximately 48,810 acres within the lower Kern River watershed, and can be divided into two distinct areas: the Buttonwillow Service Area and the Maples Service Area. The Buttonwillow Service Area comprises approximately 44,460 acres situated northwesterly of the Buena Vista Lake Bed. The Maples Service Area of BVWSD comprises approximately 4,350 acres situated easterly of the Buena Vista Lake Bed. The Henry Miller Water District (HMWD) is a part of BVWSD; however, HMWD is not a part

of BVWSD's Service Area and possesses its own water contracts with the Kern County Water Agency.

**9. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):**

- California Water Resources Control Board Construction Activities Storm Water General Permit
- San Joaquin Valley Air Pollution Control Board Dust Control Plan

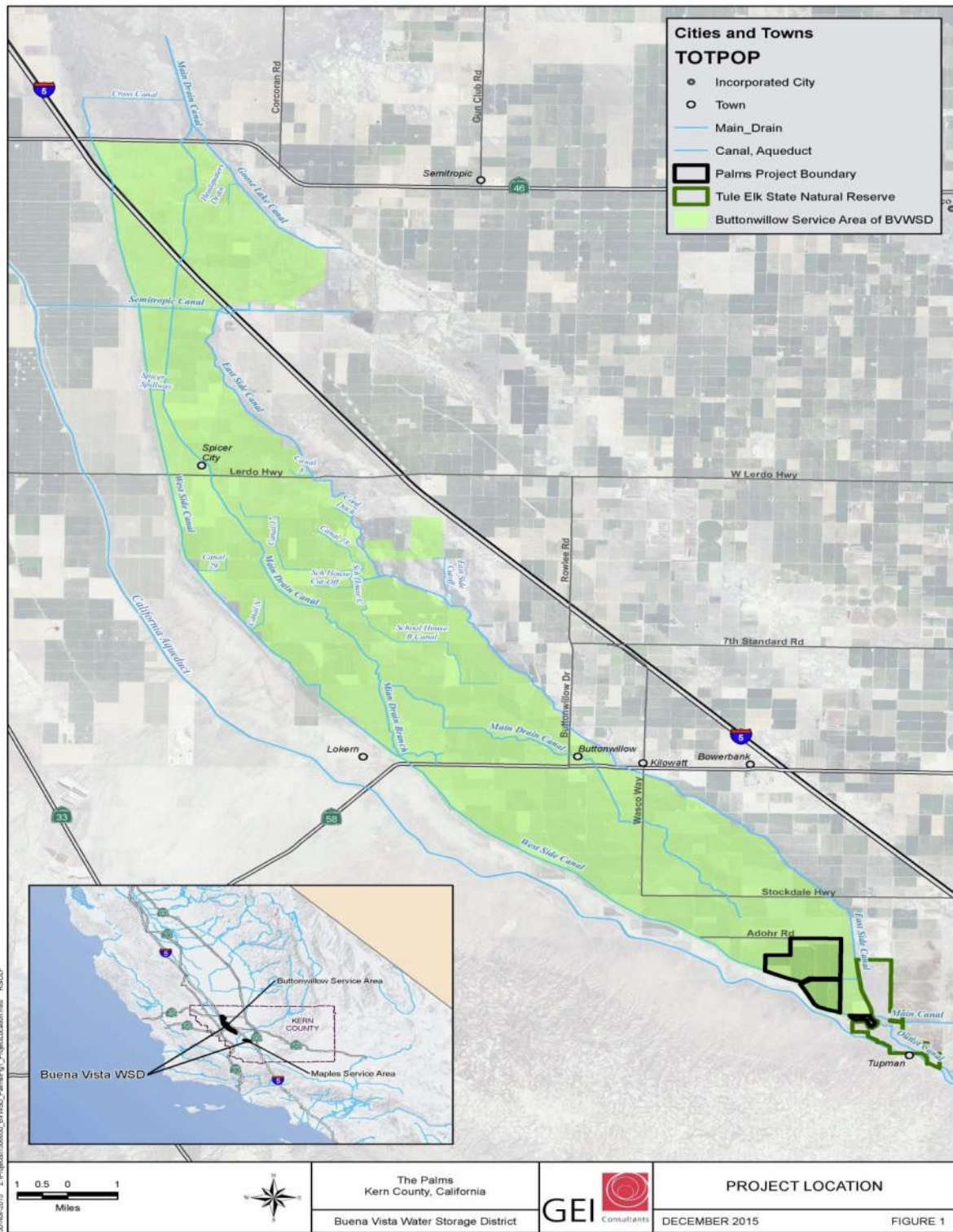
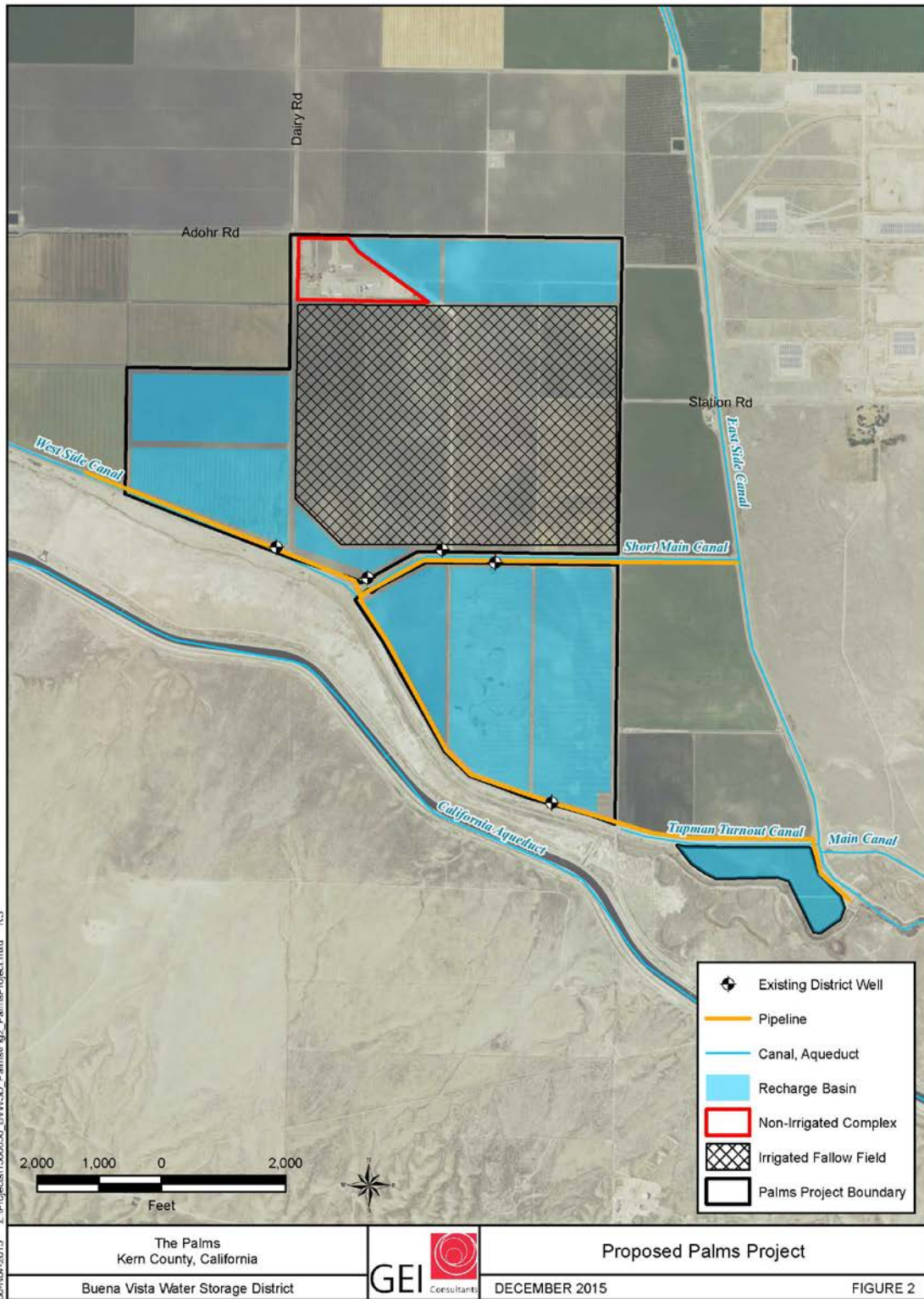


Figure 1: Project Location



**Figure 2: Proposed Palms Groundwater Banking Project**



## Section B. Environmental Factors Potentially Affected

---

The environmental factors checked below would be potentially affected by this project.

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Aesthetics                          | <input checked="" type="checkbox"/> Agriculture and Forestry Resources | <input checked="" type="checkbox"/> Air Quality                        |
| <input checked="" type="checkbox"/> Biological Resources     | <input checked="" type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology / Soils                               |
| <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials                 | <input checked="" type="checkbox"/> Hydrology / Water Quality          |
| <input type="checkbox"/> Land Use / Planning                 | <input type="checkbox"/> Mineral Resources                             | <input checked="" type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population / Housing                | <input type="checkbox"/> Public Services                               | <input type="checkbox"/> Recreation                                    |
| <input type="checkbox"/> Transportation / Traffic            | <input type="checkbox"/> Utilities / Service Systems                   | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

**DETERMINATION: (To be completed by the Lead Agency)**

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature



Date

8 DEC 15

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. AESTHETICS – Would the project:</b>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-d) The project area is flat, comprising dirt roads, open water canals, and various agricultural crops. There are no significant view-sheds or scenic vistas (Figure 3). The proposed action would result in earthen canal facilities that hold water, much like the surrounding land use, buried pipes for conveying recovered water, and new well structures in an area that already contains wells. There would be little change to the existing view. The proposed project would not create any new sources of light.</i></p> <p><i>The construction activities would last approximately 6 months and only occur during daylight hours. During construction, there would be a small number of construction vehicles at the site; however, this would not be substantially different than agricultural equipment normally used. Construction and operation of the proposed project would not appear different than current operations at the BVWSD. Therefore there would be no change to visual resources from the proposed project and thus no impact to aesthetics, buildings, or surroundings.</i></p>				





**Figure 3: Typical View Shed in the Project Area**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>II. AGRICULTURE AND FOREST RESOURCES – Would the project:</b>				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>a-e) The project is located on land designated as prime farmland although currently fallow. The project will take agricultural land out of production to create the groundwater banking facility. However, the project is expected to increase water supply and water quality, and therefore have a beneficial effect on agricultural production regionally. Therefore, the impact to agriculture is deemed to be not significant.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:</b>				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-e) The Project is located within the southern San Joaquin air-shed. This portion of the air-shed is in non-attainment (does not meet standards) for federal and state air quality standards for ozone and PM2.5 (particulate matter less than 2.5 micrometers in diameter). The air-shed is in nonattainment of the state PM10 (particulate matter less than 10 micrometers in diameter) standard (San Joaquin Valley Air Pollution Control District [SJVAPCD]) 2015. The Project would involve X construction vehicles during the 6-month project implementation phase for excavation of soils to create the ponding facilities and to bury the new pipe. The primary concern for construction of the proposed project is PM10 emissions from construction. The construction of the project would be subject to SJVAPCD Rule 8021 for dust control. An approved Dust Control Plan is required if the project involves disturbing more than 5 acres of earth or moving 2,500 cubic yards per day for any 3 construction days. With the implementation of the Dust Control Plan, the proposed project is not expected to contribute substantially to existing levels of PM10 or conflict with the SJVAPCD's air quality plan. There are no sensitive receptors in the area as it is remote and with very few residents.</i></p>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. BIOLOGICAL RESOURCES – Would the project:</b>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*(a-f) The habitat assessment conducted for the proposed BVWSD Palms Project found that no natural lands are present within the boundaries of the proposed project site. However, natural lands and native habitats are present in the buffer area, in undisturbed/uncultivated areas south and east of the proposed project boundary. Areas of habitat adjacent to the project site occur along the California Aqueduct to the south and on the Tule Elk Reserve to the east. Other natural lands in proximity include the Elk Hills Oil Field, the Coles Levee Ecosystem Preserve, and the Kern Water Bank. Riparian habitat is present southeast of the project site, along the Outlet Canal.*

*The proposed project would avoid directly impacting adjacent areas of saltbush scrub and annual grassland habitat, as they occur outside the boundaries of the proposed project site. Since the proposed project would be conducted in lands disturbed by agricultural use, project implementation would not result in impacts to natural lands. The project would not interfere with movements of wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the proposed project site or buffer area.*

*No riparian, wetland, vernal pool, streams, or other sensitive community types were observed within the boundaries of the proposed project site during biological surveys. The proposed project would avoid riparian areas, designated wetlands, and potential wetland areas, as they occur outside the boundaries of the proposed project site. Based on a lack of suitable aquatic habitat in the project site, species including California red-legged frog, vernal pool fairy shrimp, Western pond turtle, delta smelt, least bittern, and marbled godwit are not expected to be present or exposed to the proposed project. Therefore, no specific measures are recommended for these species.*

*The proposed project is located outside the known range and current distribution of special-status species including California red-legged frog, giant garter snake, Delta smelt, California spotted owl, Lewis's woodpecker, Nuttall's woodpecker, and least bittern. Furthermore, based on a lack of suitable habitat with required elements, these species and others including vernal pool fairy shrimp, cactus wren, and bald eagle are not expected to be present or become established in the proposed project site or buffer area. Therefore, no specific measures are recommended for these species.*

*No suitable habitat for special-status plants is present within the boundaries of the proposed project site. No special-status plants were observed in the proposed project site during biological surveys. Based on the habitat requirements of targeted plant species and current land use, special-status plant species are not expected to be present or become established in the project site.*

*Increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. However, common wildlife species have likely become acclimated to on-going agricultural activities and oil and gas exploration, development, and production activities. Because common wildlife species observed during biological surveys are locally and regionally common, potential impacts to these resources are considered less than significant. Therefore, no avoidance or minimization measures are proposed at this time.*

*Although the project site is located in agriculture, several special-status wildlife species may potentially be present during project activities, or have low potential to occur in the proposed project site. Certain migratory bird species, such as longbilled curlew and mountain plover, may forage in agricultural areas that contain low-growing vegetation and a potential insect prey base. As a result of mobility, there is*

*potential for certain species to occasionally pass through and/or to forage in the project site. Since natural land that represents potential habitat for several San Joaquin Valley upland species are present in areas adjacent to the project site, avoidance measures to protect special-status wildlife species including, but not limited to, San Joaquin kit fox, American badger, Western burrowing owl, special-status small mammal species, and blunt-nosed leopard lizard during construction and pipeline installation are described below. Implementation of the proposed project could potentially impact individual special-status small mammal species, including giant kangaroo rat, Tipton kangaroo rat, San Joaquin antelope squirrel, San Joaquin pocket mouse, and Tulare grasshopper mouse, should they be present in the proposed project site during project implementation. Should small mammal burrows become established in the project site prior to construction, the project could impact burrows that may be potentially used by these species. Impacts to special-status small mammal species or their burrows could occur through crushing by construction equipment or entombment below ground in burrows during project activities. These species' normal behavior could also be affected due to noise and vibration from project activities. Impacts to these species would be considered significant. In the event that special-status small mammal species are present or potential small mammal burrows become established in the proposed project site, measures to protect this species from potential impacts are included and described further in the Mitigation Measures, Section E.*

*Implementation of the proposed project could potentially impact individual blunt-nosed leopard lizards, should they be present in the proposed project site during project implementation. Should California ground squirrel burrows, or other small mammal burrows become established in the project site prior to construction, the project could impact burrows that may be potentially used by blunt-nosed leopard lizards. Impacts to blunt-nosed leopard lizards or their burrows could occur through crushing by construction equipment or entombment below ground in burrows during project activities. This species' normal behavior could also be affected due to noise and vibration from project activities. Impacts to this species would be considered significant. In the event that blunt-nosed leopard lizards are present in the proposed project site, measures to protect this species from potential impacts and avoid take are included and described further in the Proposed Avoidance and Mitigation Measures section.*

*Implementation of the proposed project could potentially impact individual San Joaquin kit fox, American badgers, or their dens, should they become established within the proposed project site prior to project implementation. Impacts to badgers or kit fox could occur through crushing by construction equipment during project activities. These species could also be affected due to noise and vibration from project activities if dens are located closer than 200 feet to the proposed project site; project related noise and vibration could cause the abandonment of occupied dens. Impacts to these species would be considered significant. Avoidance and minimization measures to protect this species from potential impacts are included and described further in the Mitigation Measures, Section E.*

*Implementation of the proposed project could potentially impact individual and nesting burrowing owls should they become established within the proposed project site prior to or during project implementation. Impacts to this species could occur through crushing by construction and drilling equipment during implementation of project activities. Actively nesting burrowing owls could also be affected due to noise and vibration from project activities if nests are located near the proposed project; project related noise and vibration could cause the abandonment of active nest sites. Impacts to this species would be considered significant. Preconstruction surveys are recommended to*

*detect species presence and/or use in the project sites.*

*In the event that burrowing owls become established in the proposed project site, measures to protect this species from potential impacts are described further in the Mitigation Measures, Section E.*

*Implementation of the proposed project could potentially impact individual and nesting migratory bird species, should they become established within the proposed project site prior to project implementation. Impacts to migratory bird species could occur through crushing by construction equipment during project activities. Actively nesting birds could also be affected due to noise and vibration from project activities, if nests are located closer than 250 feet to the proposed project site. Actively nesting birds could also be affected due to noise and vibration from project activities, if nests are located within 0.5 miles of the proposed project site. In the event that Swainson's hawks become established in or near the proposed project site, avoidance and minimization measures to protect the species from potential impacts are described further in the Mitigation Measures, Section E.*

*Direct mortality or injury to sensitive animal populations could occur from earth-moving activities, if sensitive animal populations become established prior to or during project implementation. Sensitive animals could also become trapped or buried in an open trench. Avoidance and minimization measures to protect sensitive animal species from potential impacts are described further in the Mitigation Measures section E. The complete Biological Assessment for the proposed Palms project is in Section D.*



	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES – Would the project:</b>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-d) An archival records search, background studies, and an intensive, on-foot surface reconnaissance of the BVWSD Palms Project study area, Kern County, California, were conducted as part of a Phase I cultural resources survey. One prehistoric archaeological site, RABV-1, was recorded. This site is a small, sparse prehistoric lithic scatter. This site was identified and recorded on August 25, 2015. The age of the site is unknown. Mitigation for this site will be preservation in place, see Section E.</i></p> <p><i>In addition to the archaeological site, 16 isolated artifacts were recorded within the Area of Potential Effect. The isolated artifacts are categorically not significant with their recording having exhausted any research potential they might contain. No further work on or consideration of these isolated resources will be undertaken. An archaeologist be contacted in the unlikely event that archaeological resources are discovered during the construction or use of the Project are, see Section E. The complete cultural resources report is found in Section D.</i></p> <p><i>As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources. The NAHC sent BVWSD a list of tribes that have requested to be consulted regarding projects in Kern County in a letter dated September 17, 2015. BVWSD sent formal notification to the Tribes on that list on October 7, 2015. The letter included a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. No tribes have requested formal consultation.</i></p>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS – Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-e) The proposed project does not lie within the Alquist-Priolo Earthquake Fault Zone nor is it in a liquefaction or landslide zone (California Department of Conservation 2014). The lack of topography in the project area precludes landslides.</i></p> <p><i>The soils in the project area have been extensively farmed and managed for agricultural purposes. The proposed groundwater banking project consists of trenching and excavating to create channels and ponds that would hold excess water during times of high flow. Periodically, the District would need to excavate soils in the ponds and channels to maintain the berms. However, this would not lead to instability or excessive erosion. The area would not be used to support septic tanks or any other system to dispose of waste water.</i></p> <p><i>See Section D for the complete soil assessment in the Groundwater Impact Report.</i></p>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. GREENHOUSE GAS (GHG) EMISSIONS – Would the project:</b>				
a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-b) The Environmental Protection Agency's (EPA) mandatory reporting threshold for large sources of GHGs is 25,000 metric tons of CO2 emitted annually (EPA 2015). This threshold is approximately the amount of CO2 generated by 4,400 passenger vehicles per year. Comparatively, emissions from seven construction vehicles during project implementation would be considerably lower. Because these activities would be similar to existing conditions, for both construction and operation, and will be far below the threshold level of emissions, the project GHG emissions would not represent a substantial change and would not conflict with the Kern county's GHG emissions reduction program.</i></p>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-h) No hazards are found on the site. No hazardous materials will be transported to or from the site. There are no sites on the Cortese list in the project area. Wildfires are not a significant risk from the project. The project will not impact any emergency evacuation plans or emergency response plans. There is not an airport land use plan in the project area.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX. HYDROLOGY AND WATER QUALITY – Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre- existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*(a-j) The depth to groundwater Palms Project area is currently between 160 and 180 feet below ground surface (bgs). Before the current drought, levels were higher at between 120 and 140 feet bgs. The results of the analysis for the Groundwater Assessment (Section D) indicate that the proposed project will have the beneficial impact of locally raising groundwater levels in the vicinity of the groundwater recharge basins.*

*The recharge of surface water with groundwater through recharge operations will result in a blended water quality. The actual aquifer water quality resulting from the mixing of surface and groundwater will depend on the volume of water recharge, the duration of recharge and the distance away from the project. No adverse geochemical reactions are predicted based on the mixing of surface and groundwater quality at the Palms project. Because both surface water sources have lower levels of dissolved solids, trace minerals and major ions, the blended mix that results from recharge will result in lower levels of total dissolved solids, major ions and trace minerals in the mixing zone within the aquifer.*

*Phase I and II Environmental Site Assessments have been conducted in the project area (Appendix D). The Phase I ESA reported several potential sources of contamination to groundwater. Five underground storage tanks (USTs) which held diesel and gasoline fuels, an air strip for crop dusters where stained soils were observed, several above ground storage tanks (ASTs), and storage of agricultural chemicals. Additionally, the Phase II ESA collected soil samples of the shallow subsurface. TPH - Mineral Oil was detected at four sites and the pesticides dieldrin, endrin, and endosulfan were detected at seven sites. The pesticide concentrations were above industrial screening levels (RWQCB ESLs) but did not exceed other state or federal screening levels (CHHSLs or RSLs). BVWSD would mitigate the potential threat to groundwater quality resulting from the potential migration of fuel and farm chemicals from soil into groundwater. See Mitigation Measures in Section E.*

*The Palms project area is located on 1160 acres of flat and vacant lands. Berms would be construction around the project site to hold water and recharge the aquifer. Implementation of the water holding facilities would not increase flood risk to the project area as water would naturally seep through the soil layers to recharge the aquifer.*

*Surface water available to BVWSD for use in the Palms project may include water from the Kern River, from the Friant-Kern Canal, or the California Aqueduct.*

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. LAND USE AND PLANNING – Would the project:</b>				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-c) The proposed project is located in an area zoned for agriculture and will serve existing farmland. The project is located outside of existing communities and is consistent with existing zoning. There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or state habitat conservation plans covering the proposed project site. There would not be a conflict with conservation plans or land use plans as zoning would not change in the project area.</i>				



	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XI. MINERAL RESOURCES – Would the project:</b>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-b) The proposed project is not located in an area with mineral resources.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. NOISE – Would the project result in:</b>				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-f) The project is located in an agricultural land use area with no known sensitive receptors. There would be no changes to existing operation and no change in existing noise levels. Construction is temporary, occurring during the day, and is located in a remote area, without a population center or many residences. Since the project is not located near any sensitive receptors, construction noise will not have a significant impact.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII. POPULATION AND HOUSING – Would the project:</b>				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-b) The proposed project is located in an agricultural area and away from population centers. The project will result in no new housing. In addition, the project will result in no new long-term employment. The construction phases would last approximately 6 months and no additional employees would be required to operation the new facilities. The expected increase in water due to the increase in groundwater supplies would be used in times of drought to increase available water supplies regionally.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIV. PUBLIC SERVICES –</b>				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a) The proposed project is located in an undeveloped area. The characteristics of the facilities pose no increase in fire risk. In addition, the construction phase will be relatively short with no construction activities occurring at night. The operation phase will require no additional employees to maintain and operate. Therefore the project will demand no additional public services.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. RECREATION –</b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-b) No recreational facilities exist in the project area. The proposed project will not increase the population nor otherwise affect local recreational facilities.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVI. TRANSPORTATION / TRAFFIC – Would the project:</b>				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<i>(a-f) The proposed project occurs in a rural area with lightly travelled roads. The project will result in no additional employees or transit routes. Construction traffic will utilize existing public roads to deliver equipment, supplies, and workers to the construction sites. Construction of the project will employ only a few individuals at a time. Therefore, changes in transportation reliability or access would not be significant.</i>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. UTILITIES AND SERVICE SYSTEMS – Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-g) No wastewater treatment facilities occur in the project area. Storm water and agricultural runoff currently collects within certain existing ditches and canals. The proposed project will result in no new wastewater facilities or wastewater flow. Minimal waste will be generated during construction and no increase in waste production will occur during the operation of the project. The water holding facilities would be comprised of dirt and construction would not create a substantial amount of waste material. The project will be designed to capture and reuse storm water that collects within project facilities. The project will conserve existing water supplies and make them more readily available to existing water users. Therefore, the proposed project will not place constraints on the local utilities and services that would create adverse impacts.</i></p>				



	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVIII. MANDATORY FINDINGS OF SIGNIFICANCE –</b>				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><i>(a-c) The Palms will enable the District to better sustain groundwater levels and improve groundwater quality, two objectives of California’s Groundwater Sustainability Management Act. California continues to be in the midst of a State of Emergency due to grossly diminished statewide supplies of water and prolonged drought conditions, including as declared and proclaimed by the Governor in his January 17, 2014 Proclamation and April 25, 2014 Proclamation, and his Executive Orders B-26-14, B-28-14, and B-29-15 the last of which was issued on April 1, 2015. The National Oceanic Atmospheric Administration (NOAA) and climatologists have recently and continue to report a high-probability of extreme wet weather occurring this winter in Southern California and the San Joaquin Valley due to El Niño conditions. Additionally, the surface water that would have been attributed to the project area will now be allocated to the balance of the District, providing all landowners an additional supply of surface water.</i></p> <p><i>Past, present, and probable future projects include the Northern Area Project and the Brackish Groundwater Remediation Project. BVWSD prepared an Initial Study and Mitigated Negative Declaration as required under the California Environmental Quality Act for the Northern Area Project (NAP), which entailed the installation of approximately 20 miles of buried pipeline to convey water and reduce leakage from open earthen canals. The BVWSD has evaluated the environmental effects of the NAP and mitigation measures similar to measures established within the NAP have been established for the Palms Project. Construction of the Palms would not have a significant</i></p>				

*cumulative effect to resources in the Proposed Action area if mitigation measures are followed during construction.*

*The Brackish Groundwater Remediation Program (BGRP) another future project that would mitigate for the increase in salt concentrations to the perched aquifer by installing approximately 60 wells, 200 feet apart, along the west side within the existing ROW of the NAP. The wells would extract brackish, unpalatable water from a shallow supply in the area. The brackish water would be blended with better quality water and supplied to local agricultural users (Figure 5). An Environmental Impact Report (EIR) for the BVWSD Water Management Program (State Clearinghouse No. 2009011008) was prepared in 2009 for the BGRP (in addition to three other proposed projects).*

*Portions of the NAP are under construction and the construction of the BGRP is in the planning phase. Construction for the Palms project would potentially occur concurrently with the NAP, but prior to the BGRP. Emission from the construction vehicles for the NAP and Palms projects would remain cumulatively less than significant.*

## Section C. References

---

- California Department of Conservation. 2014.  
<http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm>.
- CDFG (California Department of Fish and Game). 2004. Approved survey methodology for the blunt-nosed leopard lizard. Unpublished protocol, California Department of Fish and Game, Sacramento, California. 4 pp.
- CDFG (California Department of Fish and Game). 2012. Staff Report on Burrowing Owl Mitigation. State of California, Natural Resources Agency, Department of Fish and Game. March 7, 2012. 34 pp.
- San Joaquin Valley Air Pollution Control District (SJAPCD). 2012.  
<http://www.valleyair.org/transportation/CEQA%20Rules/SPALTables61912.pdf>.
- San Joaquin Valley Air Pollution Control District (SJAPCD). 2014.  
<http://www.valleyair.org/aqinfo/attainment.htm>.
- Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology For Swainson's Hawk Nesting Surveys In California's Central Valley. May 31, 2000. 5 pp.
- United States Environmental Protection Agency (EPA). 2015. Greenhouse Gas Reporting Program. <http://www.epa.gov/ghgreporting/>
- USFWS (U.S. Fish and Wildlife Service). 2011. U.S. Fish and Wildlife Service Standardized Recommendations For Protection Of The Endangered San Joaquin Kit Fox Prior To Or During Ground Disturbance. Prepared by the Sacramento Fish And Wildlife Office, January 2011. 9 pp.



## **Section D. Technical Memos and Reports**

---

**Biological Assessment  
Buena Vista Water Storage District  
Palms Groundwater Banking Project  
Kern County, California**

**Prepared for:**

**GEI Consultants, Inc.  
700 NE Multnomah Street, Suite 230  
Portland, Oregon 97232  
Contact: Ms. Ginger Gillin  
(503) 342-3777**

**Prepared by:**

**Robert A. Booher Consulting  
Environmental Planning and Management  
3287 Congressional Court  
Fairfield, California 94534  
Contact: Bob Booher, R.E.A.  
(707) 399-7835**

**December 2015**

## **INTRODUCTION**

The Buena Vista Water Storage District (BVWSD) proposes to construct the Palms Groundwater Banking Project (Palms Project) in western Kern County, California. The Palms Project is a groundwater replenishment and water banking project that will extend over 1,160 acres and will include features needed to apply surface water for groundwater recharge as well as facilities needed for recovery and treatment of stored groundwater. The Project will facilitate conjunctive management in Kern County by expanding the capacity to capture excess surface water available from the Kern River and the State Water Project (SWP) and to retain these waters in local aquifers.

The Palms will enable the BVWSD to better sustain groundwater levels and improve groundwater quality, two objectives of California's Groundwater Sustainability Management Act. High quality groundwater recharged by the Project will flow to aquifers that are sources for domestic and municipal wells providing water to residents of the cities of Bakersfield and Taft, to the disadvantaged community (DAC) of Buttonwillow, and to replenish groundwater under the Tule Elk State Natural Reserve.

Land to be used by the Project has an established history of irrigated crop production. Retiring these lands from irrigated agriculture will enable water to be delivered to the area based on availability of water for recharge rather than in response to the pattern of crop demand. Therefore, while the volume of water to be used in the project area will remain based on the BVWSD's entitlements (and no water applied historically in the project area will be applied offsite), the timing of the deliveries will differ in a way that results in important benefits.

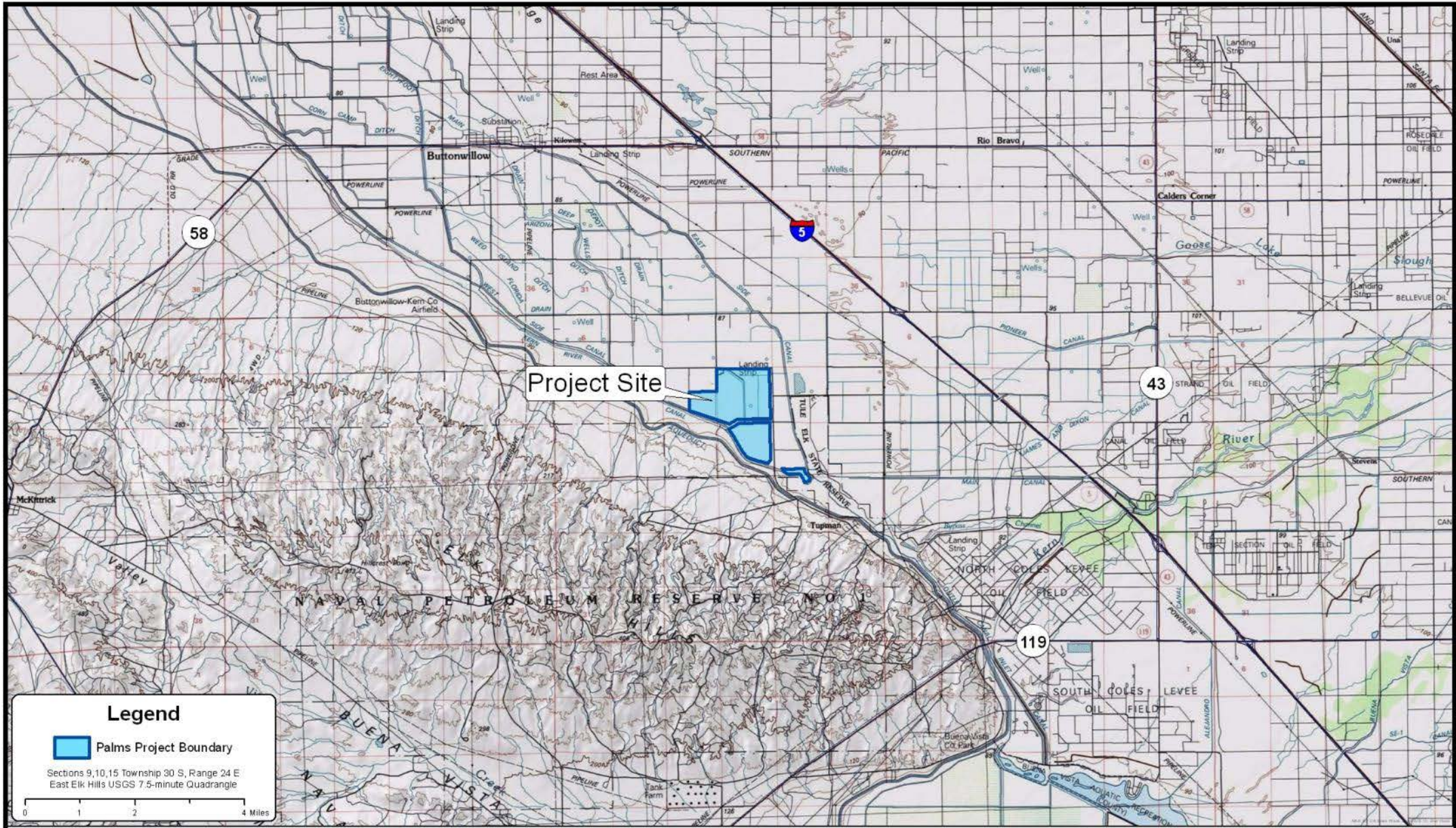
Robert A. Booher Consulting (RAB Consulting) was retained by GEI Consultants, Inc. (GEI) to conduct biological surveys and provide an assessment of the proposed Palms Project for submittal to GEI and the BVWSD. RAB Consulting conducted biological surveys for the proposed project to identify known or potential habitat for special-status wildlife and plant species. This report presents the results of our biological surveys and includes measures that would be implemented during the proposed project to avoid or minimize potential impacts to sensitive wildlife and plant species.

## **PROJECT LOCATION AND ENVIRONMENTAL SETTING**

The Palms Project is proposed approximately 1.2 miles northwest of Tupman, in western Kern County, California (see Figures 1 and 2). The Palms Project will be located in the Buttonwillow Sub-basin area of the Kern Sub-basin and will lie on land that has already been acquired by the District. The proposed Palms Project occurs in the East Elk Hills U.S. Geological Survey (USGS) 7.5-minute quadrangle.

As illustrated in Figure 2, the Project site is bordered by Adohr Road to the north, the California Aqueduct to the south, and agricultural fields to the east and west. The California State Parks Tule Elk State Natural Reserve is adjacent to the east. Tupman Road provides access to the project site and existing dirt roads used for agriculture and water distribution (canals) provide





**Legend**

Palms Project Boundary

Sections 9, 10, 15 Township 30 S, Range 24 E  
East Elk Hills USGS 7.5-minute Quadrangle

0 1 2 4 Miles

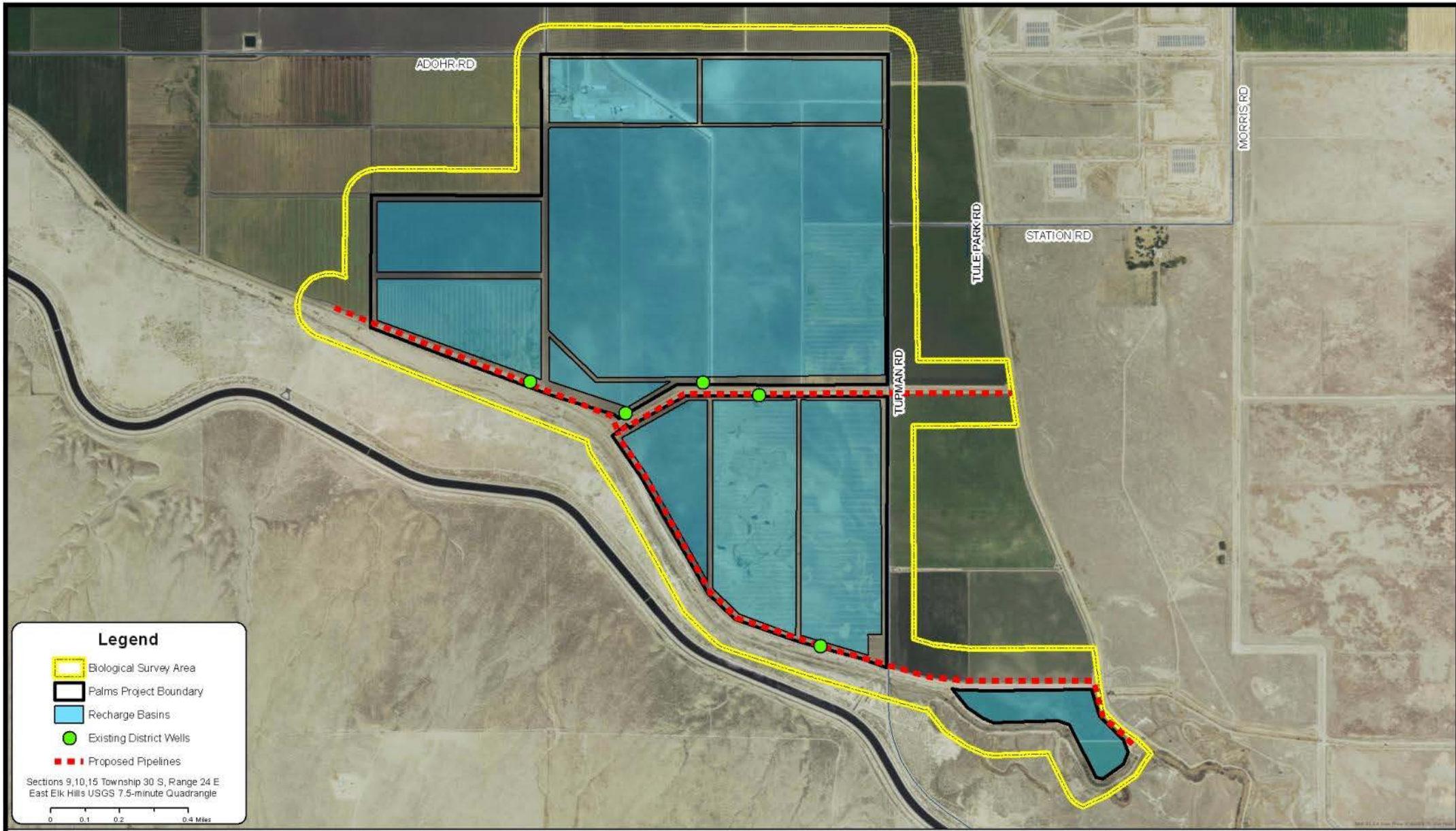
Robert A. Booher Consulting  
Environmental Planning & Management  
3287 Congressional Court  
Fairfield, California 94534  
Telephone (707) 399-7835

**FIGURE 1**  
**Project Vicinity Map**

GEI Consultants, Inc.  
5001 California Avenue, Suite 120  
Bakersfield, California 93309

N





**Legend**

- Biological Survey Area
- Palms Project Boundary
- Recharge Basins
- Existing District Wells
- Proposed Pipelines

Sections 9, 10, 15 Township 30 S, Range 24 E  
East Elk Hills USGS 7.5-minute Quadrangle

0 0.1 0.2 0.4 Miles

Robert A. Booher Consulting  
Environmental Planning & Management  
3287 Congressional Court  
Fairfield, California 94534  
Telephone (707) 399-7835

**FIGURE 2**  
**Project Location Map**

GEI Consultants, Inc.  
5001 California Avenue, Suite 120  
Bakersfield, California 93309



access to existing BVWSD wells, proposed recharge basins, and proposed pipeline alignments within the project boundaries.

Topography in the proposed project site is generally flat, and much of the land in this region of the San Joaquin Valley has historically been used for agriculture. Based on aerial imagery, agricultural lands occur in the Project site, and extend approximately 30 miles north from the California Aqueduct. The proposed Palms Project area has been historically used for agriculture (alfalfa, cotton, onions) and includes a portion of the former Hydrogen Energy California (HECA) Project site (URS 2013). Surrounding land uses include agricultural production of cotton, alfalfa, and pistachios, and water distribution including canal operation and maintenance.

Undisturbed areas adjacent to the proposed Palms Project that are not under agricultural production were observed to support sensitive habitats including Valley Saltbush Scrub, Valley Sink Scrub, and Alkali Seep. Generally, these remnant areas of habitat are present in the California Aqueduct Right-of-Way (ROW) to the south, and to the east on the Tule Elk State Natural Reserve. In addition, riparian habitat persists in the Outlet Canal located southeast of the project site. No perennial or intermittent streams are present within the boundaries of the proposed Palms project site.

The term “project site” is used throughout this document to describe the specific area where a pipeline will be constructed and installed, or where pond areas will be created. Representative photographs of the proposed project site are presented in Appendix A.

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or State habitat conservation plans covering the proposed project site.

## **PROJECT DESCRIPTION**

The Palms Project is a groundwater replenishment and water banking project that will extend over 1,100 acres and will include features needed to apply surface water for groundwater recharge as well as facilities needed for recovery and treatment of stored groundwater. The Project will facilitate conjunctive management in Kern County by expanding the capacity to capture excess surface water available from the Kern River and the State Water Project (SWP) and to retain these waters in local aquifers. The Project will be located in the Buttonwillow Sub-basin area of the Kern Sub-basin and will lie on land that has already been acquired by the District.

The Palms will enable the District to better sustain groundwater levels and improve groundwater quality, two objectives of California’s Groundwater Sustainability Management Act. High quality groundwater recharged by the Project will flow to aquifers that are sources for domestic and municipal wells providing water to residents of the cities of Bakersfield and Taft, to the disadvantaged community (DAC) of Buttonwillow, and to replenish groundwater under the Tule Elk State Natural Reserve.

Land to be used by the Project has an established history of irrigated crop production. Retiring these lands from irrigated agriculture will enable water to be delivered to the area based on

availability of water for recharge rather than in response to the pattern of crop demand. Therefore, while the volume of water to be used in the project area will remain based on the District's entitlements (and no water applied historically in the project area will be applied offsite), the timing of the deliveries will differ in a way that results in important benefits.

The Project involves multiple stages: 1) construction of recharge facilities, 2) installation of pumps in existing wells and approximately 4 miles of pipeline, 3) construction and equipping additional recovery wells with associated piping, and 4) water treatment facilities if needed. Stages 3 and 4 primarily involve the recovery aspect and would be constructed at a later date. Construction of stages 1 and 2 would include activities consistent with digging, trenching, and excavation of soil to create water holding ponds and channels, and the installation new pipeline. Linear trenches would be excavated around the perimeter of the water holding facilities to install approximately 16,500 feet of 24-inch-diameter pipe and another 5,000 feet of 36 inch pipe to convey water recovered from the Palms project area.

## **Project Objectives**

The Palms Project will have the following primary objectives:

- Increase conjunctive management on the west side of Kern County by expanding the area's ability to accept surface water for groundwater recharge during periods when excess surface water is available. Groundwater stored by the Project will be available to meet demands during periods when access to surface water is limited.
- Reduce agricultural demand by replacing 1,100 acres of irrigated farmland with spreading grounds.
- Raise groundwater elevations in the Project area. Groundwater elevations will fluctuate between wet periods, when recharge raises groundwater elevations, and dry periods, when elevations drop due to groundwater recovery. However, the Palms will be managed so that overall elevations will increase from those observed historically and the amplitude of changes between wet periods and dry periods will be regulated. The increase in groundwater levels and reduction in the amplitude of fluctuations will reduce pumping lifts for domestic and municipal wells in the area influenced by the Project.

## **Project Benefits**

Project benefits will fall into following three primary categories: 1) benefits to groundwater users and prospective banking partners due to better management of groundwater elevations, 2) habitat benefits resulting from higher groundwater elevations, and 3) water quality improvements due to reduced leaching of contaminants to groundwater. These benefits are described in greater detail below.

- 1) Water supply benefits will result from a general increase in groundwater elevations in the Project area as well as a stabilization of these elevations. Although the Palms will function

as a banking project with groundwater levels increasing during periods when water is recharged and declining when groundwater is pumped to meet local demands or for delivery to banking partners, the Project will be operated so that the amplitude of these fluctuations will be regulated. This will aid in regional compliance with the Sustainable Groundwater Management Act and will enable groundwater pumpers (both Project proponents and local domestic and municipal users) to reduce pumping costs and lessen the need to deepen wells.

- 2) Local habitat benefits in stream channels and wetlands will result from increased base flow in regional streams generated by the higher groundwater elevations, particularly in the vicinity of the Tule Elk State Natural Reserve.
- 3) In addition to aiding in management of groundwater elevations, the replacement of irrigated lands with spreading grounds will reduce loadings of nitrates and salts now conveyed to groundwater from deep percolation of irrigation applications. This will be accomplished by eliminating the application of nitrogen and other fertilizers and by reducing the effect of evapotranspiration on concentrating the salinity of applied water. The resulting improvements in groundwater quality will benefit all groundwater users, particularly local users and banking partners supplying potable water. These water quality improvements are also expected to reduce the costs of treating all recovered water.

## **Project Facilities**

Construction activity, including equipment staging, would be confined to the area within the 1,100 acre site acquired by the BVWSD. Construction would begin with earthwork needed to build recharge facilities. This would include construction of low berms with material for these berms being generated on-site by removal of surface soil that overlies shallow, highly permeable river-borne deposits. Recharge would also be encouraged by retaining water in the canals and natural channels which run through the Palms Project area. After completion of recharge facilities, the second stage of construction would include installation of wells, pumps, pipelines and treatment facilities needed for recovery of stored groundwater for use locally and for conveyance to banking partners.

The pipeline would run parallel to the West Side Canal, the Short Main Canal, and the Tupman Turnout Canal. The new pipeline would be installed largely within previously disturbed areas located adjacent to field roads. Palms Project construction would include activities consistent with digging, trenching, and excavation of soil to install the new pipeline. No disturbance in natural lands, designated wetlands, riparian areas, sensitive habitats, or other rare communities is planned for the proposed project.

Construction activity for recharge facilities would be completed within six months, while construction of recovery facilities would occur based on the rate of recovery and level of treatment needed to meet local needs and to fulfill banking agreements.

## **SURVEY METHODOLOGIES**

A literature review was completed and field surveys were conducted to identify sensitive habitats and special-status wildlife and plant species that could potentially be present in the proposed project area. The following sections describe the literature and databases that were reviewed prior to conducting biological surveys and the survey methods that were used.

**Literature Review:** Prior to conducting biological surveys for the proposed project and during the preparation of this biological assessment, we reviewed RAB Consulting data files and records from the following sources:

- United States Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC) (USFWS 2015a);
- United States Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) (USFWS 2015b);
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB) RareFind 5 and Biological Information and Observation System (BIOS) (CDFW 2015a); and
- California Native Plant Society's (CNPS) online *Inventory of Rare and Endangered Vascular Plants of California, 8<sup>th</sup> Edition* (CNPS 2015).

From each review, a list of special-status species was generated for those that occur in or may be affected by projects in the East Elk Hills USGS 7.5-minute quadrangle, where the proposed project is located. Several special-status species which have been documented in proximity to (east of) the proposed project site occur in the Tupman quadrangle. Each quadrangle represents an area that measures approximately 70 square miles, so special-status species that have been recorded or may potentially occur in the 140 square mile area are identified in Table 1. This list also includes federally listed species and migratory birds identified in the USFWS IPaC Trust Resource Report (USFWS 2015a) that was obtained for the proposed project area. Special-status species are those taxa that are legally protected under the State or Federal Endangered Species Act (ESAs) or other regulations and considered sufficiently rare by the scientific community to qualify for such listing. Special-status species generally fall into one or more of the following categories:

- Plants or animals listed or proposed for listing as Threatened or Endangered under the Federal ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 1711 [listed animal] and various notices in the Federal Register [FR][proposed species]);
- Plants or animals that are candidates for possible future listing as Threatened or Endangered under the Federal ESA (61 FR 40, February 28, 1996);
- Plants or animals listed or proposed for listing by the State of California as Threatened or Endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);

- Animal Species of Special Concern to the CDFW (Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [reptiles and amphibians], Moyle et al. 1989 [fish]);
- Animals Fully Protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);
- Plants listed as California Rare Plant Rank (CRPR) 1A are presumed extinct in California (CNPS 2015);
- Plants listed as California Rare Plant Rank (CRPR) 1B are considered rare, threatened, or endangered in California or elsewhere (CNPS 2015);
- Plants listed as California Rare Plant Rank (CRPR) 2 are considered rare or endangered in California, but more common elsewhere (CNPS 2015);
- Plants identified as California Rare Plant Rank 3 (former CNPS List 3) are those for which more information is needed; a review list (CNPS 2015); and
- Plants listed as California Rare Plant Rank (CRPR) 4 are of limited distribution, on a watch list (CNPS 2015). These taxa may be included as special-status species on the basis of local significance or recent biological information.

Sources consulted for information on distribution of special-status wildlife species, as well as local and regional sensitive fauna include Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [reptiles and amphibians], and Moyle *et al.* 1989 [fish]. Background information for several listed wildlife and plant species (including biology, reasons for decline, limiting factors, etc.) that have potential to occur within and/or adjacent to the proposed project site and buffer area is found in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Williams *et al.* 1998). Species descriptions and information of the identification, life histories, and habitat requirements of listed and other special-status species were obtained through the USFWS Environmental Conservation Online System (ECOS), the CDFW California Wildlife and Habitat Relationships System (CWHR), NatureServe Explorer (NatureServe 2015), and the Cornell Lab of Ornithology website (All About Birds 2015). USFWS 5-Year Species Reviews were consulted for federally listed species including but not limited to San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, and Kern mallow. In addition, the draft Biological Assessment (BA) prepared for the former HECA project was reviewed, as the Palms Project area includes a portion of that former HECA project site (URS 2013). Relevant technical information from these databases, reports, literature sources and websites and are incorporated and referenced as appropriate.

Each species identified in the database queries and records searches were evaluated in terms of their likelihood to occur within the project site and buffer area. This evaluation considered the known distribution and habitat requirements of the species and the following findings were prepared:



- Known to Occur – species was observed within the project site or buffer area during biological surveys, or the species has previously been documented within or immediately adjacent to the project site.
- Potentially Present – species has not been documented within or immediately adjacent to the project site, but should be expected in areas of suitable habitat near the project site during the appropriate season and time of day.
- Low Potential – species has not been documented within or immediately adjacent to the project sites, nor is it likely to occur in the project site, but its presence cannot be completely discounted as a result of mobility, or due to incomplete information on the taxon’s distribution or habitat requirements.
- No Potential – species does not occur within or immediately adjacent to the project site due to the lack of required habitat features for the species, or the known range of the species is well defined and does not include the project vicinity.

### **SENSITIVE WILDLIFE SPECIES SURVEYS**

We surveyed the proposed Palms Project site and a 500-foot surrounding buffer area on August 14, 2015 and August 17-25, 2015 for special-status wildlife and plant species and sensitive habitats. We used standard agency approved guidelines to survey for special-status species. These methods are identified in the following references: CNPS (CNPS 2001 and 2015), CDFW (CDFG 1990, 1995, 2000, 2003, 2004, 2009, 2012, and CDFW 2015), Orloff (1987), Nelson (1987), The California Burrowing Owl Consortium (1993), Tollestrup (1976), and USFWS (1989, 1995, 1996, 1999, 2000, and 2011). Biological surveys were conducted to determine the following:

- Suitability of habitat(s) to support special-status wildlife species
- Presence of known and potential San Joaquin kit fox dens
- Presence of individual blunt-nosed leopard lizards (BNLL) and their habitat
- Sightings, burrows, and sign of sensitive small mammal species
- Sightings, burrows, and sign of Western burrowing owls and other sensitive bird species
- Presence of suitable nesting, roosting, and/or foraging habitat for migratory and other sensitive birds
- Vegetation association, habitat types, and special-status plant species
- Dominant plant canopy and ground cover species
- Habitat condition and quality
- On-site, adjacent, and surrounding land uses.

**San Joaquin Kit Fox** - We conducted diurnal surveys for San Joaquin kit fox and sign (dens, scat, tracks, prey remains, etc.) of species presence or use. Surveys were completed along transects spaced 30 to 50 feet apart following CDFW Approved Survey Methodologies for Sensitive Species (CDFG 1990) and by USFWS guidelines (USFWS 1989, 1995, 1999, and 2011). If San Joaquin kit

fox sign and/or dens were identified, they were recorded using GPS and mapped on USGS topographic maps and/or aerial imagery. Underground dens would be classified according to the following USFWS kit fox den definitions (USFWS 2011):

***Known Den:*** Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms “active” and “inactive” when referring to any San Joaquin kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens so often, with the result that the status of a given den may change frequently and abruptly.

***Potential Den:*** Any subterranean hole within the species’ range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for San Joaquin kit fox use.

***Natal or Pupping Den:*** Any den used by San Joaquin kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposed of this definition either term applies.

***Atypical Den:*** Any manmade structure which has been or is being occupied by a San Joaquin kit fox den. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

**San Joaquin Antelope Squirrel** - We surveyed for San Joaquin antelope squirrels, their scats and potential burrows while conducting surveys for other species with potential to occur in the project site, including San Joaquin kit fox and giant kangaroo rat (CDFG 1990). Surveys were conducted using daytime line transects at 30 to 50 foot intervals covering the area in a systematic manner. While walking transects, biologists scanned the area (including using binoculars) looking for the species and listening for the species vocalizations. Although burrow entrance sizes overlap with other rodents, SJAS burrows can usually be distinguished by the presence of irregularly-sized scats (CDFW Date Unknown).

**Blunt-Nosed Leopard Lizard** - We surveyed for potential presence of blunt-nosed leopard lizard (BNLL) and to evaluate suitability of habitat to support this species by walking parallel transects

spaced at 30 to 50 foot intervals in areas of potential habitat (Tollestrup 1976, as modified by CDFG 1990 and 2004). Emphasis was placed on the identification of small mammal burrows that may serve as potential for this species. Since the proposed project would not modify or result in impacts to habitat, protocol-level surveys for the species were not completed.

**Other Sensitive Wildlife** - During biological surveys, RAB Consulting searched for presence of habitat features (riparian areas, vernal pools, cliffs, roosting sites, nesting sites, nests, dens, burrows, etc.) that may be suitable for potential use by special-status wildlife species. We surveyed for evidence of Tipton kangaroo rat, giant kangaroo rat, Western burrowing owl, Swainson's hawk, and other targeted species of concern (see Table 1), which consisted of recording sightings of the species and/or their sign (i.e., tracks, scat, dens, nests, etc.).

### **SPECIAL-STATUS PLANT SURVEYS**

**Literature Review:** Prior to conducting field surveys, we reviewed information from various sources to determine special-status plant species known to occur, or have potential to occur in the vicinity to the proposed project. Special-status plant species include species listed as Endangered, Threatened, or Rare by the USFWS, CDFW, and species ranked by the CNPS using the California Rare Plant Ranking (CRPR) system (CNPS 2015). Sources consulted for information on the distribution of special-status plant species include occurrence records and maps from the CNDDDB (CDFW 2015a), the USFWS IPaC Species List (USFWS 2015a), and CNPS records (CNPS 2015) for the East Elk Hills and Tupman USGS 7.5 minute quadrangles. Sources consulted for information on the historic distribution of special-status plant species include regional and local floras (Abrams 1923, 1944, 1951, Abrams and Ferris 1960, Hickman 1996, Twisselmann 1956, 1967, Moe 1995, Munz and Keck 1968). In addition, the USFWS 5 -Year Species Review and Summary reports and Recovery Plans were consulted for locations of endemic San Joaquin Valley listed plant species that have potential to occur within or in proximity to the proposed project site (USFWS 2013a and Williams *et. al.* 1998).

**Plant Species Surveys and Identification** – Surveys for the proposed Palms Project were conducted on August 14, 2015 and August 17-25, 2014. These surveys were floristic in nature and were completed concurrent with surveys to detect sensitive wildlife species. The project site was walked systematically to ensure thorough coverage of areas subject to disturbance. Surveys were conducted consistent with the USFWS *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000), CDFW *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), and CNPS *Botanical Survey Guidelines* (CNPS 2001). These guidelines include recommendations for determining when a botanical survey is needed, and how surveys may be conducted when a proposed activity may affect special-status native plants and natural communities. Surveys were floristic in nature, meaning that plants observed were identified to the species or subspecies level, where appropriate. However, since the proposed project is located in agricultural lands, and project activities would not alter or otherwise modify natural vegetation, formal botanical surveys were not completed for the Palms Project.

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
<b>Amphibians</b>					
California red-legged frog	<i>Rana draytonii</i>	FT	SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No Potential. No aquatic breeding habitat is present in the proposed project site or buffer area. No suitable upland aestivation habitat is present in the proposed project site. No individuals were observed during biological surveys. California red-legged frogs have not been documented within the boundaries of the proposed project site or within a 1-mile radius (CDFW 2015a). The proposed project site is not located in an area that has been designated as critical habitat for the species (USFWS 2015b).
<b>Birds</b>					
Tricolored blackbird	<i>Agelaius tricolor</i>	BCC	SSC	Freshwater emergent wetlands. This highly colonial species requires open water, protected nesting substrate, and a foraging area with insect prey within a few kilometers of the colony. The species is largely endemic to California and is most numerous in the Central Valley and surrounding foothills. A year-round resident commonly associated with dairy farms, which contain elements and resources they require.	Low Potential. No suitable aquatic or nesting habitat was observed in the proposed project site or buffer area. However, potential foraging habitat is present in the project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of the proposed project site (see Figure 3a). Tricolored blackbird has been recorded 2.3 miles southeast of the project site and 7.0 miles to the east (CDFW 2015a).
Bell's sparrow	<i>Amphispiza belli</i>	BCC	-	A year-round resident, found in desert, shrubland, and chaparral. Prefers semi-open habitats and shrubs for nesting, often in association with sagebrush or saltbush. Feeds on insects, spiders, and seeds.	Low Potential. No suitable (nesting) habitat is present in the proposed project site. Potential habitat was observed in the buffer area, south and east of the proposed project site. No individuals were observed during biological surveys. This species has not been documented in the CNDDDB within the boundaries of or in

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					proximity to the proposed project site (CDFW 2015a).
Short-eared owl (Wintering)	<i>Asio flammeus</i>	BCC	SSC	Large expanses of open grassland. Nests on the ground and occasionally in hayfields and stubble fields. The species preys on small mammals and requires an abundance of prey, as they are active both day and night.	Potentially Present. Overwinter, potential habitat is present in the project site. However, prey would be considered limited in the project site based on a lack of small mammal burrows in the project site that would support a suitable prey base. Potential habitat is also present in the buffer area south and east of the proposed project boundary. No individuals were observed during biological surveys. The species has not been documented in the CNDDDB within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Western burrowing owl	<i>Athene cunicularia</i>	BCC	SSC	A year-round resident of open grasslands, prairies, farmlands, and deserts. Found in level to gently sloping areas with sparse vegetation or bare ground. The species also uses developed areas including agricultural fields, golf courses, vacant lots, airports, etc. Nests underground, commonly in ground squirrel burrows.	Potentially Present. Potential habitat is present in the buffer area, south and east of the project site. Furthermore, agricultural lands in the project site may be used as foraging habitat. No individual burrowing owls, occupied burrows, or sign of their presence (i.e., whitewash, castings, feathers, etc.) were identified during biological surveys. The species has not been recorded within the boundaries of the proposed project site. Numerous sightings of burrowing owls and several active burrows have been documented south of the project site (see Figure 3a). The species has been recorded 0.3 miles to the south, along the California Aqueduct, and in various locations east of Tupman Road, on the Tule Elk State Natural Reserve (CDFW 2015a).

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
Swainson's hawk	<i>Buteo swainsoni</i>	BCC	CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Potentially Present. Potential foraging habitat is present in the project site and buffer area, in areas of agriculture planted to suitable crops (alfalfa, etc.). No suitable nesting habitat is present within the boundaries of the proposed project site. Potential roosting and nesting habitat was observed outside the project boundaries, in areas that support riparian vegetation, along the Outlet Canal to the south and the Tule Elk State Natural Reserve to the east. No individuals were observed during biological surveys. Swainson's hawks have been documented 0.7 miles and 5.6 miles to the east, on the Tule Elk State Natural Reserve, and Kern Water Bank Authority, respectively (CDFW 2015a).
Costa's hummingbird (Breeding)	<i>Calypte costae</i>	BCC	-	Desert riparian, desert and arid-scrub foothills and chaparral. Breeds in the Mojave and Sonoran Deserts of California and Arizona. During the hottest days, these birds move to chaparral, scrub, or woodland habitats.	Low Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, south and east of the proposed project site, and where riparian habitat is present along the Outlet Canal. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	BCC	-	Occurs in deserts of the southwest. Limited to regions where thorny bushes or trees offer nesting sites; typically sunny hillsides of mesas next to mountains, and along gravelly watercourses.	No Potential. The project site is outside the known range and current year-round distribution of the species. Furthermore, no suitable habitat is present in the proposed project site or buffer area.

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
Mountain plover (Wintering)	<i>Charadrius montanus</i>	BCC	SSC	Short grassland, freshly plowed fields or newly sprouting grain fields. Short vegetation or bare ground, in flat topography; prefers grazed areas with burrowing rodents.	Potentially Present. Potential foraging habitat (overwinter) is present in the project site and buffer area. No individuals were observed during biological surveys. This species has been recorded 0.6 miles east of the proposed project site (see Figure 3a). Mountain plover has also been documented 0.9 miles east of Tupman Road, on the Tule Elk State Natural Reserve (CDFW 2015a).
Peregrine falcon	<i>Falco peregrinus</i>	BCC	FP	A year-round resident that is more common along coasts. Peregrine falcons perch on tall features, and require cliffs, water towers, buildings, or other tall structures for nesting. Feeds on medium sized birds such as pigeons, shorebirds, and ducks.	Low Potential. Potential roosting and nesting habitat (palm trees, agricultural tanks, etc.) are present in the proposed project site; however, no suitable foraging habitat was observed. Forage in the project site would be considered limited based on a lack of suitable prey. No individuals or evidence of the species were observed during biological surveys. Peregrine falcon has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Bald eagle (Wintering)	<i>Haliaeetus leucocephalus</i>	BCC	CE, FP	Lakes, rivers, reservoirs, marshes, and coasts. Nest in forested areas near large bodies of water. Prefers tall, mature coniferous or deciduous trees for perching. Bald eagles typically steal fish from osprey or mammals, rather than catching it for themselves. Roosts communally in winter.	No Potential. No suitable habitat is present in the proposed project site or buffer area. No potential roosts were observed in the project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Least bittern	<i>Ixobrychus exilis</i>	BCC	SSC	A year-round resident in freshwater marshes and along the borders of ponds and reservoirs that provide	No Potential. No suitable habitat is present in the proposed project site or buffer area. No individuals were observed



**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
				ample cover. Nests are usually placed in tules, cattails, and bulrushes, over water.	during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Loggerhead shrike	<i>Lanius ludovicianus</i>	BCC	SSC	A year-round resident that prefers open habitats with scattered shrubs and trees. Hunts from fence posts and utility poles, preying on insects, birds, lizards, and small mammals. The species is known for impaling its prey on barbed wire, thorns, or other sharp objects for later consumption.	Known to Occur. Potential foraging habitat is present in the proposed project site and buffer area. Potential nesting habitat occurs in the buffer area south of the proposed project site; however, no suitable nesting habitat is present within the boundaries of the proposed project site. One (1) individual loggerhead shrike was observed during biological surveys. The species has not been documented in the CNDDDB in the proposed project site (CDFW 2015a).
Marbled godwit (Wintering)	<i>Limosa fedoa</i>	BCC	-	A large shorebird that occurs in wetland, riparian, tidal flat, and sand dune habitats, and in open shallow water along shorelines. Feeds on crustaceans, mollusks, worms, grasshoppers and other insects, seeds and tubers.	No Potential. No suitable habitat is present in the proposed project site or buffer area. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Lewis's woodpecker (Wintering)	<i>Melanerpes lewis</i>	BCC	-	Open woodland habitats. Needs trees for cavity nesting. This species of woodpecker feeds in flight or gleans insects from the tree surface, rather than excavating wood for boring insects.	No Potential. No suitable habitat is present in the proposed project site or buffer area. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
Long-billed curlew (Wintering)	<i>Numenius americanus</i>	BCC	-	Sparse, short-grassland habitats and agricultural fields. In winter, migrates to the coast and interior Mexico, in wetlands, tidal estuaries, mudflats, and flooded fields. Migrates north from wintering grounds during March and April. These large shorebirds feed mainly on insects (grasshoppers, beetles), earthworms, marine crustaceans (shrimp), and marine invertebrates.	Potentially Present. Potential foraging habitat (overwinter) is present in the project site and buffer area. No long-billed curlews were observed during biological surveys; however, surveys were completed outside of their winter migration period. The species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Fox sparrow (Wintering)	<i>Passerella iliaca</i>	BCC	-	Breed in remote areas of coniferous forest, mountain scrub, and dense thickets. These sparrows may be seen over winter in tall chaparral, scrub and forest habitats, generally foraging on the ground and in leaf litter for insect prey.	Low Potential. No suitable habitat is present in the proposed project site. Potential foraging habitat is present in buffer area, south and east of the project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Nuttall's woodpecker	<i>Piccooides nuttallii</i>	BCC	-	A year-round resident confined to the oak woodlands of and riparian areas in California; rarely found in conifers. Requires trees for cavity nesting. This species of woodpecker consumes insects and arthropods, and occasionally fruit, but does not feed on acorns.	No Potential. No suitable habitat is present in the proposed project site or buffer area. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Brewer's sparrow	<i>Spizella breweri</i>	BCC	-	Arid scrub and desert grasslands. Found year-round in association with big sagebrush ( <i>Artemisia tridentata</i> ) and other large sagebrush species (>5 feet tall), including saltbush and creosote.	Low Potential. No suitable habitat is present in the proposed project site. However, potential foraging habitat is present in the buffer area south and east of the proposed project site. No individuals were observed during biological surveys. This species has not been documented

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
California spotted owl	<i>Strix occidentalis occidentalis</i>	BCC	SSC	One of three subspecies of spotted owl, found only in California. Found year-round in old-growth coniferous and other mature forests, and rocky canyons. Feeds on small mammals, mainly woodrats, flying squirrels, and bats.	No Potential. The proposed project site is located outside the known range of the species. No suitable habitat is present in the proposed project site or buffer area. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Le Conte's thrasher	<i>Toxostoma lecontei</i>	-/BCC	SSC	Alkali desert scrub and open desert wash, saltbush ( <i>Atriplex</i> spp.) scrub, and succulent cholla ( <i>Opuntia</i> spp.) scrub habitats. Nests in dense, spiny shrubs or densely branched cactus, usually 2-8 feet above the ground. Accumulated leaf litter is important as cover for the species' prey.	Known to Occur (Buffer Area). Le Conte's thrasher has been recorded in the buffer area, southeast of the proposed project (see Figure 3a) approximately 0.3 miles to the southeast (CDFW 2015a). No suitable habitat was observed in the project site. However, potential (nesting) habitat for this species is present in the buffer area south and east of the proposed project site, in areas that support a shrub component. No individuals were identified in the project site or buffer area during biological surveys.
Least Bell's vireo	<i>Vireo bellii pusillus</i>	FE	CE	Inhabits low dense riparian vegetation along water or dry parts of intermittent streams. Typically associated with willow, cottonwood, baccharis, wild blackberry or mesquite in desert locations.	Low Potential. The proposed project site is located outside the known range and current distribution of the species (USFWS 2006). However, potential habitat is present in the buffer area to the southeast, mainly along the Outlet Canal. No suitable habitat is present in the proposed project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of the proposed project site (see Figure 3a). Least Bell's vireo was historically recorded 5.3 miles

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					south of the project site (CDFW 2015a).
<b><i>Invertebrates</i></b>					
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	-	Found in short-lived seasonal cool-water vernal pools with low to moderate dissolved solids.	No Potential. No suitable habitat (vernal pools) was observed within the proposed project site. Vernal pool fairy shrimp has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
<b><i>Fishes</i></b>					
Delta smelt	<i>Hypomesus transpacificus</i>	FT	CE	Restricted to the San Francisco Bay and Sacramento-San Joaquin Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties in California. These slender-bodied fish feed on small free-floating crustaceans and occasionally insect larvae. The species requires shallow open waters with freshwater flow and specific conditions (i.e., salinity and temperature) for spawning, rearing, etc.	No Potential. The proposed project site is located outside the known distribution and current range of the species. Furthermore, no suitable habitat is present in the proposed project site or buffer area. Delta smelt has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
<b><i>Mammals</i></b>					
San Joaquin (Nelson's) antelope squirrel	<i>Ammospermophilus nelsoni</i>	-	CT	Found in the western San Joaquin Valley from 150 to 3,600 feet in elevation. Found on dry sparsely vegetated loam soils. This species digs burrows or uses other rodent (kangaroo rat or California ground squirrel) burrows. Requires widely scattered shrubs, forbs, and grasses in broken terrain with gullies and washes.	Low Potential. No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, south along the California Aqueduct, and the Elk Hills Oilfield, southeast along the Outlet Canal, and east at the Tule Elk State Natural

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					Reserve. No San Joaquin antelope squirrels were observed during biological surveys. The species has not been documented in the project site (see Figure 3a). The species has been recorded approximately 0.2 miles east on the Tule Elk State Natural Reserve and 0.3 miles to the south (CDFW 2015a).
Giant kangaroo rat	<i>Dipodomys ingens</i>	FE	CE	Prefer annual grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils. However, most remaining populations are found on poorer, marginal habitats which include shrub communities on a variety of soil types and on slopes up to about 22°. Giant kangaroo rats develop burrow systems with one to five or more separate openings. Utilize two types of burrow: 1) a vertical shaft with a circular opening and no dirt apron, and 2) a larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth.	Low Potential. No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No sign of giant kangaroo rat presence (i.e., mowing, hay stacking, seed caching, vertical burrow entrances, etc.) was identified during biological surveys. This species has not been documented within the boundaries the proposed project site (see Figure 3a). The nearest occurrence of giant kangaroo rat to the project site is recorded 0.8 miles to the southwest, on the south side of the California Aqueduct (CDFW 2015a).
Short-nosed kangaroo rat	<i>Dipodomys nitratooides brevinasus</i>	-	SSC	Permanent resident of alkali desert scrub habitat and herbaceous habitats with scattered shrubs. Currently found mainly in the southwestern San Joaquin Valley at	Low Potential. No suitable habitat for the species was observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
				elevations up to 1800 ft. Forages on open ground and under shrubs, eating mainly seed for annual forbs and grasses. Requires sandy loam soils for excavation of burrows.	uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. This species has not been documented within the boundaries of the proposed project site (see Figure 3a). Short-nosed kangaroo rats have been recorded 4.1 miles south and southeast of the proposed project site (CDFW 2015a).
Tipton kangaroo rat	<i>Dipodomys nitratoides nitratoides</i>	FE	CE	Saltbush scrub and sink scrub communities in the Tulare Lake Basin of the Southern San Joaquin Valley. Requires soft, friable soils which escape seasonal flooding. This species digs burrows in elevated soil mounds often at the bases of shrubs.	Known to Occur (Historically in the Buffer Area). The species has been (historically) documented in the buffer area of the project site (see Figure 3a). Tipton kangaroo rats have been recorded 0.1 mile east of the project site, on the Tule Elk State Natural Reserve, and in locations 5 miles to the southeast and 7 miles to the northeast (CDFW 2015a). No suitable habitat or small mammal burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Coles Levee Ecosystem Preserve.

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
Tulare grasshopper mouse	<i>Onychomys torridus tularensis</i>	-	SSC	Found in the hot, arid portions of the southern San Joaquin Valley and adjacent interior valleys of the Coast Ranges (e.g., Cuyama Valley and Carrizo Plain). Occurs in a variety of habitats including blue oak woodland, upper Sonoran subshrub scrub, alkali sink and mesquite associations (on the valley floor), and grasslands (at the base of the foothills).	Low Potential. No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. As illustrated in Figure 3a, the species has not been recorded in the project site (CDFW 2015a).
San Joaquin pocket mouse	<i>Perognathus inornatus inornatus</i>	-	SSC	Found in grasslands and blue oak savannahs. Requires friable soils for digging.	Low Potential. No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. The species has not been recorded in the project site (see Figure 3a). San Joaquin pocket mouse has been documented 0.2 miles to the east, on the Tule Elk State Natural Reserve (CDFW 2015a).
Buena Vista Lake ornate shrew	<i>Sorex ornatus relictus</i>	FE	SSC	Marshlands and riparian areas in the Tulare Basin. Uses stumps, logs, and litter for cover. Prefers moist soil.	Low Potential. Riparian habitat that may serve as potential for this species is present to the southeast, outside the proposed project site, along the Outlet



**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					Canal. No suitable habitat for Buena Vista Lake ornate shrew was observed in the proposed project site. The species has not been documented within the boundaries of the proposed project site (see Figure 3a). Buena Vista Lake shrew has been recorded approximately 2.7 miles southeast of the proposed project site (CDFW 2015a).
American badger	<i>Taxidea taxus</i>	-	SSC	The species is found in a variety of open herbaceous and shrub vegetation types/habitats with dry, friable soils. It is widely distributed in California, with the exception of the humid coastal belt, occurring from sea-level to alpine meadows and coniferous forests.	Low Potential. No suitable habitat for the species was observed in the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows that were of appropriate size for use by badger or sign (i.e., scat, tracks, digging, prey remains, etc.) of the species were observed during biological surveys. Badgers have been documented approximately 4.6 miles southeast and 5.8 miles east of the project site (CDFW 2015a).
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	CT	Inhabit annual grasslands or grassy open stages with scattered shrubby vegetation. Require loose-textured sandy soils for burrowing, and a suitable prey base.	Known to Occur. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. While no

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					suitable habitat for the species was observed in the proposed project site, agricultural lands may serve as foraging habitat for the species. No individual San Joaquin kit fox were observed however tracks were identified during biological surveys in an existing roadway. No active dens or other sign (i.e., scat, digging, prey remains, etc.) of kit fox activity was detected. Numerous sightings of individual kit fox (including road kills), and active dens have been documented in the CNDDDB in proximity to the project site (see Figure 3a). San Joaquin kit fox have been recorded 0.3 miles and 2.3 miles to the east, on the Tule Elk State Natural Reserve and the Kern Water Bank Authority (CDFW 2015a). The species has also been documented in various locations south of the California Aqueduct, approximately 0.5 miles and 0.8 miles south of the proposed project site (CDFW 2015a).
<b>Reptiles</b>					
Western pond turtle	<i>Emys marmorata</i>	-	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, typically with aquatic vegetation. Require basking sites and suitable upland habitat (sandy banks or grassy open fields) near water for egg-laying.	No Potential. The proposed project site does not support suitable habitat for the species, as existing canals and ditches in the project site are regularly maintained and lack aquatic vegetation year round. Where canals and ditches were observed to have water, the adjacent upland habitats were under active agricultural production (i.e., alfalfa, cotton). No individuals were observed or evidence of the species was identified during biological surveys.

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					Western pond turtles have not been recorded within the boundaries of the proposed project site (see Figure 3a). The species has been documented 0.4 miles to the south, along the California Aqueduct, and 0.8 east of the proposed project site, at the Tule Elk State Natural Reserve (CDFW 2015a).
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE	CE, FP	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts. May excavate their own burrows, but typically utilize small mammal or other lizard burrows.	Low Potential. No suitable habitat for blunt-nosed leopard lizard is present in the proposed project site since lands within the project boundaries are under agricultural use. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. No individual blunt-nosed leopard lizards were observed during biological surveys and the species has not been recorded in the project site. Blunt-nosed leopard lizard has been documented approximately 0.4 miles to the east, on the Tule Elk State Natural Reserve (see Figure 3a). Blunt-nosed leopard lizards have been recorded in locations east of Interstate 5, approximately 2.7 miles and 4.5 miles northeast of the project site (CDFW 2015a).

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
San Joaquin whipsnake	<i>Masticophis flagellum ruddocki</i>	-	SSC	Open, dry habitats with little or no tree cover. Found in valley grassland and saltbush scrub in the San Joaquin Valley. The species needs mammal burrows for refuge and egg laying sites.	Low Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. No individual San Joaquin whipsnakes were observed during biological surveys. The species has been documented 9.9 miles east of the proposed project site (CDFW 2015a).
Giant garter snake	<i>Thamnophis gigas</i>	FT	CT	A highly aquatic species that prefers fresh water marsh and low gradient streams. Has adapted to drainage ditches and irrigation canals.	Known to Occur (Historically). The proposed project site is located outside the current known range and distribution of the species (CDFW 2015b). However, giant garter snake was historically documented within the boundaries of the project site (see Figure 3a). The species was identified in that location prior to, but not during, a 1986-87 study of the species' distribution (CDFW 2015a). The species was also historically captured in a location approximately 4.6 miles to the southeast (CDFW 2015a).
<b>Plants</b>					
Horn's milk-vetch	<i>Astragalus hornii</i> var. <i>hornii</i>	-	Rank 1B.1	Playas, meadows and seeps. Found along lake margins, and in alkaline soils. Elevation range: 60 to 850 meters. Blooming period: May	No Potential. No suitable habitat is present in the proposed project site or buffer area. No individuals or evidence of the species was observed during

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
				through October.	biological surveys. Horn's milk-vetch has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 4.6 miles to the southeast and 6.3 miles east of the project site (CDFW 2015a).
Heartscale	<i>Atriplex cordulata</i> var. <i>cordulata</i>	-	Rank 1B.2	Chenopod scrub, valley and foothill grassland, meadows, and seeps. Found on alkaline flats and scalds in the Central Valley, and on sandy soils. Elevation range 0 to 560 meters. Blooming period: April through October.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. Heartscale has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 4.5 miles to the south (CDFW 2015a).
Crownscale	<i>Atriplex coronata</i> var. <i>coronata</i>	-	Rank 4.2	Chenopod scrub, valley and foothill grassland, and vernal pools. Found in alkaline and clay soils. Elevation range 1 to 590 meters. Blooming period: March through October.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, crownscale has not been documented within the boundaries of the proposed project site (CDFW 2015a).
Lost Hills crownscale	<i>Atriplex coronata</i> var. <i>vallicola</i>	-	Rank 1B.2	Chenopod scrub, valley and foothill grassland, and vernal pools. Found in powdery, alkaline soils that are vernal moist with <i>Frankenia</i> , <i>Atriplex</i> spp., and <i>Distichlis</i> . Elevation range: 0 to 605 meters.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
				Blooming period: April through August.	biological surveys. Lost Hills crownscale has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 2.0 miles and 3.5 miles southeast of the proposed project site (CDFW 2015a).
Mexican mosquito fern	<i>Azolla microphylla</i>	-	Rank 4.2	Marshes, swamps, ponds or slow water. Elevation range: 30 to 100 meters. Blooming period: August.	No Potential. No suitable habitat for this species is present in the proposed project site or buffer area. As illustrated in Figure 3b, Mexican mosquito fern has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Slough thistle	<i>Cirsium crassicaule</i>	-	Rank 1B.1	Chenopod scrub, marshes and swamps (sloughs), and riparian scrub. Elevation range: 3 to 100 meters. Blooming period: May through August.	Known to Occur (Buffer Area). The species has been recorded in the buffer area of the proposed project (see Figure 3b). Slough thistle has also been documented along the east bank of the Kern River, approximately 4.6 miles southeast of the project site (CDFW 2015a). Potential habitat is present in the buffer area southeast of the proposed project site, mainly along the Outlet Canal. However, no suitable habitat for this species is present within the boundaries of the proposed project site. No individuals or evidence of the species were observed during biological surveys.
Recurved larkspur	<i>Delphinium recurvatum</i>	-	Rank 1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland. Found on alkaline soils. Elevation range: 3 to 790 meters. Blooming period: March through June.	No Potential. No suitable habitat for this species is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
					surveys. Recurved larkspur has not been documented within the boundaries of the proposed project site (see Figure 3b). However, the species has been recorded approximately 0.6 miles and 1.3 miles southwest of the proposed project site (CDFW 2015a).
Kern mallow	<i>Eremalche kernensis</i>	FE	Rank 1B.1	Chenopod scrub, valley and foothill grassland. Elevation range: 70 to 1,290 meters. Blooming period: March through May.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. Kern mallow has not been recorded within the boundaries of the proposed project site (see Figure 3b). The species has been documented in locations approximately 1.9 miles to the west and 4.8 miles southeast of the biological survey area (CDFW 2015a).
Hoover's eriastrum	<i>Eriastrum hooveri</i>	Delisted	Rank 4.2	Chenopod scrub, pinyon and juniper woodlands, and valley and foothill grasslands. Elevation range: 50 to 915 meters. Blooming period: March through July.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. The species has not been recorded within the boundaries of the proposed project site (see Figure 3b). The species has been documented in numerous locations south and southeast of the biological survey area (CDFW 2015a).
Cottony buckwheat	<i>Eriogonum gossypinum</i>	-	Rank 4.2	Chenopod scrub, valley and foothill grassland. Elevation range: 100 to 550 meters. Blooming period:	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer



**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
				March through September.	area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, this species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).
Tejon poppy	<i>Eschscholzia lemmonii</i> <i>ssp. kernensis</i>	-	Rank 1B.1	Chenopod scrub, valley and foothill grassland. Elevation range: 160 to 1,000 meters. Blooming period: March through May.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, Tejon poppy has not been documented within the boundaries of the proposed project site. The species has been recorded approximately 2.2 miles southwest and 2.9 miles southeast south of the proposed project site (CDFW 2015a).
Oil neststraw	<i>Stylocline citroleum</i>	-	Rank 1B.1	Chenopod scrub, valley and foothill grassland, and coastal scrub. Elevation range: 50 to 400 meters. Blooming period: March through April.	No Potential. No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, oil neststraw has not been documented within the boundaries of the proposed project site. The species has been recorded at several locations south of the proposed project site, within 1 to 2 miles (CDFW 2015a).
San Joaquin	<i>Trichostema ovatum</i>	-	Rank 4.2	Chenopod scrub, valley and foothill	No Potential. No suitable habitat is

**Table 1**  
**Special-Status Species Potentially Occurring in the Proposed Project Site**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Requirements	Potential to Occur in Project Site
bluecurls				grassland. Elevation range: 65 to 320 meters. Blooming period: July through October.	present in the proposed project site. Potential habitat is present in the buffer area, in undisturbed/uncultivated areas. However, no individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, San Joaquin bluecurls have not been documented within the boundaries of the proposed project site (CDFW 2015a).

**Status Codes:**

**Federal**

FE = Federally listed as Endangered  
 FT = Federally listed as Threatened  
 FC = Federal Candidate species  
 BCC = USFWS BCC-Birds of Conservation Concern

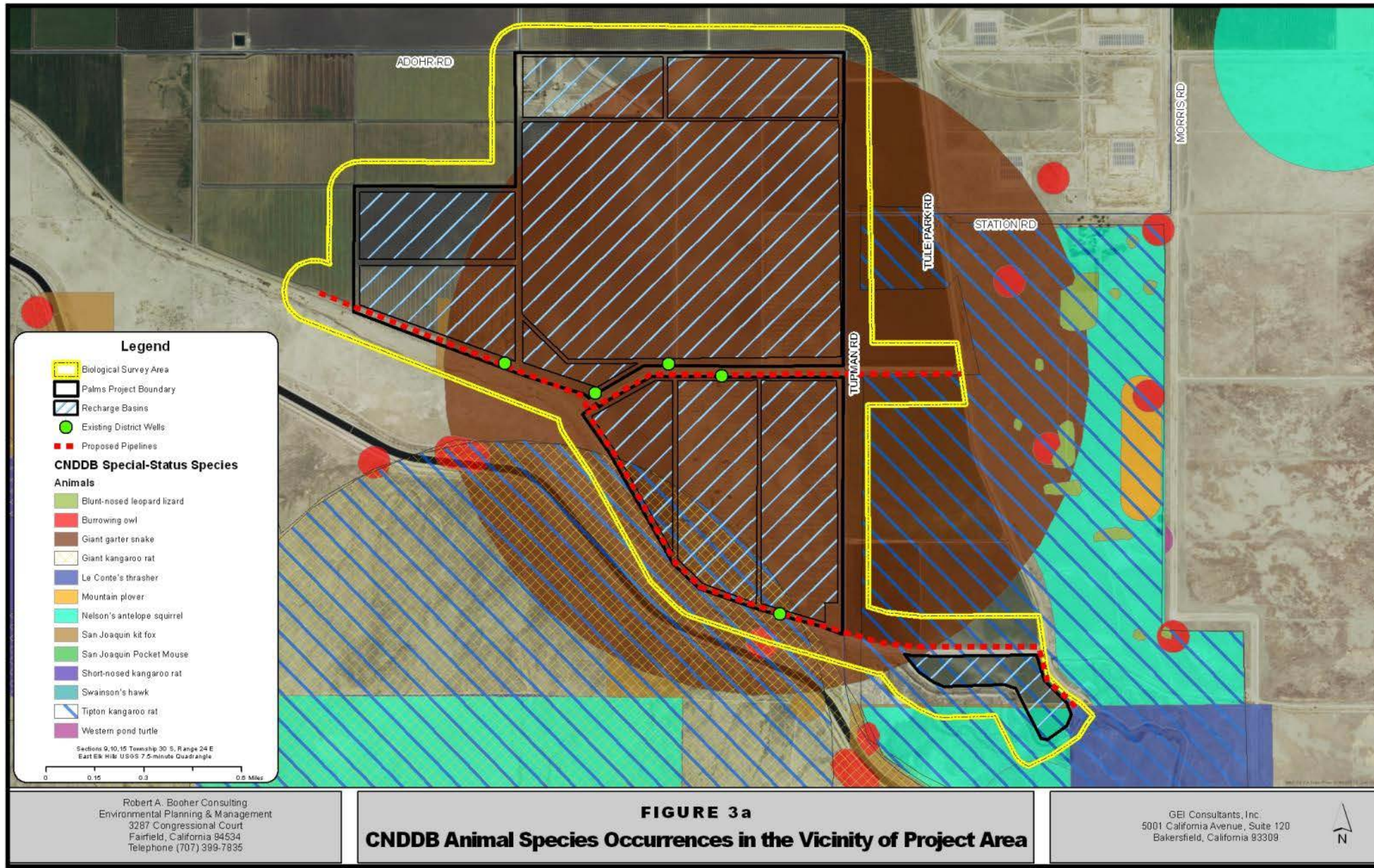
**State**

CE = California listed as Endangered  
 CT = California listed as Threatened  
 CR = California listed as Rare  
 FP = CDFW Fully Protected  
 SSC = CDFW Species of Special Concern  
 WL = CDFW Watch List

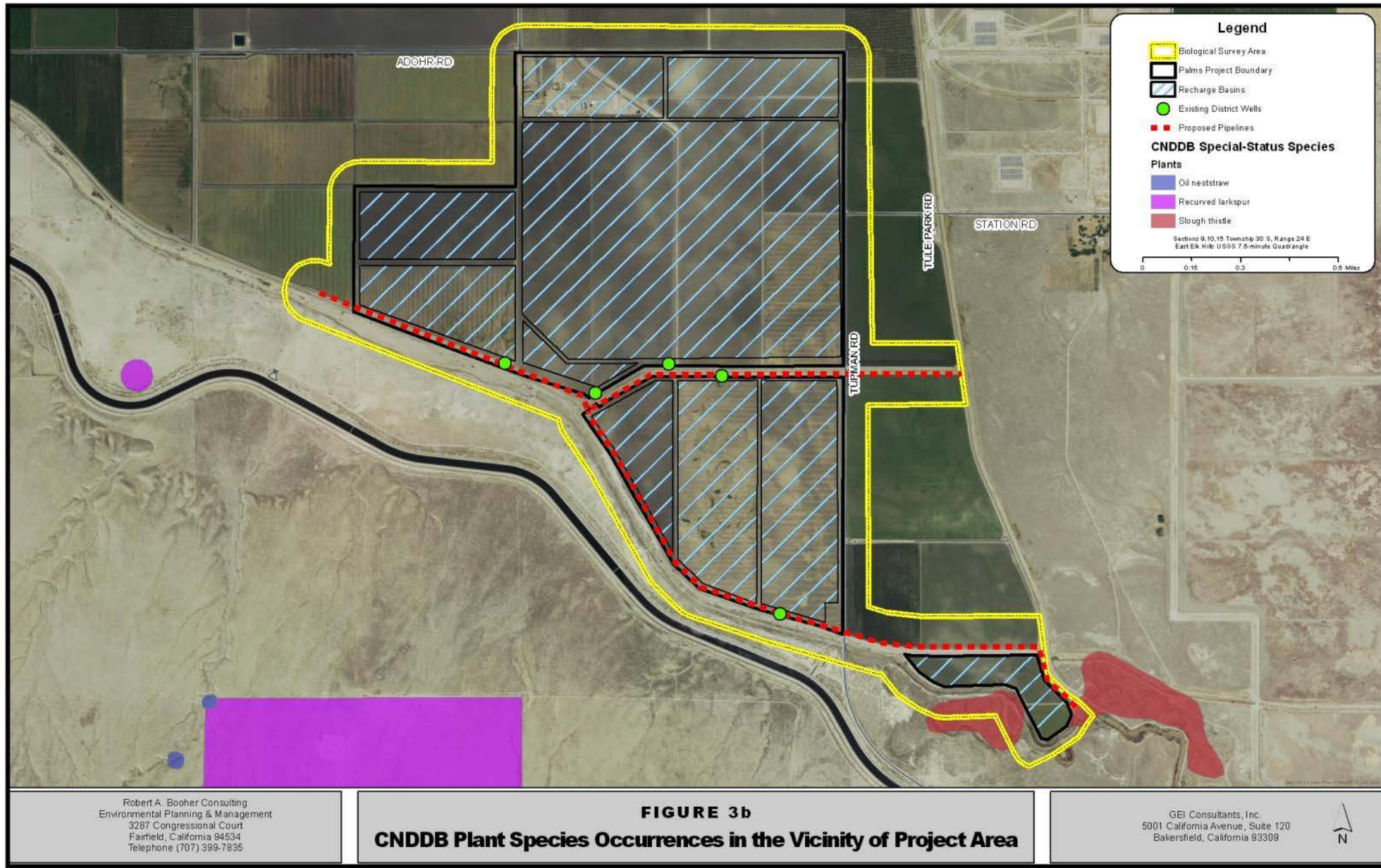
**California Rare Plant Rank (CRPR)**

California Rare Plant Rank 1A = Plants presumed extinct in California  
 California Rare Plant Rank 1B = Plants rare, threatened, or endangered in California and elsewhere  
 California Rare Plant Rank 2A = Plants presumed extirpated from California but more common elsewhere  
 California Rare Plant Rank 2B = Plants rare, threatened or endangered in California, but more common elsewhere  
 California Rare Plant Rank 3 = Plants about which we need more information; a review list  
 California Rare Plant Rank 4 = Plants of limited distribution; a watch list.  
 California Rare Plant Rank Rarity Status of .1 = Seriously endangered in California  
 California Rare Plant Rank Rarity Status of .2 = Fairly endangered in California

Status, distribution, and habitat information from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB) RareFind 5 (CDFW 2015a); California Native Plant Society (CNPS), California Rare Plant Electronic Inventory, 8<sup>th</sup> Edition (CNPS 2015); and United States Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System (IPaC) (USFWS 2015a).







## **RESULTS AND DISCUSSION**

Results of our biological surveys for the proposed BVWSD Palms Project are presented below. The following discussion briefly describes current land use and habitat types that were present at the time of biological surveys and focuses on special-status wildlife and plant species that could potentially occur within the project site based on historic observations and known occurrences that have been documented in proximity to the project. Lists of wildlife and plant species observed during biological surveys for the proposed BVWSD Palms Project are included as Tables 2 and 3. Representative photographs of the proposed project site and buffer areas are included as Appendix A.

### **HABITAT TYPES**

#### **Agricultural Land**

Agricultural lands may be defined broadly as lands used primarily for production of food and fiber. Based on aerial imagery, agricultural lands extend 30 miles north and east from the California Aqueduct (see Figure 2). The proposed Palms Project site has been historically used for agriculture (alfalfa, cotton, onions) and includes a portion of the former Hydrogen Energy California (HECA) Project site (URS 2013). The Palms Project is proposed in agricultural lands; lands observed in the project site were comprised of alfalfa, wheat, and fallow fields (previously planted to cotton). Agricultural lands immediately adjacent to the project site were planted to alfalfa, cotton, and pistachios. Surrounding land uses include water distribution (canal operation and maintenance).

Plant species found in this community were composed primarily of weedy, non-native species that are generally considered common, unwanted agricultural pests in the State of California and elsewhere. Wildlife use of this community is limited due to the lack of suitable habitat and active agricultural practices tend to result in frequent or continued disturbance. Wildlife species observed in agricultural areas during biological surveys included common raven (*Corvus corax*), common side-blotched lizard (*Uta stansburiana*), and coyote (*Canis latrans*).

#### **Ruderal/Disturbed**

Ruderal/disturbed habitats were observed in previously disturbed areas throughout the proposed project site, including a residential area. While canals and levee roads in the project site were generally free of vegetation, common plants found in disturbed areas were primarily weedy, non-native and native species. Wildlife use of this community is limited due to frequent disturbance and the monocultural and weedy nature of plant species present. Although the diversity of wildlife is limited, species that do occur in disturbed habitats are often abundant and well adapted to the presence of humans. Wildlife species observed in this community during biological surveys included common raven (*Corvus corax*), common side-blotched lizard (*Uta stansburiana*), and coyote (*Canis latrans*).

**Table 2.** Animal Species Observed during Biological Surveys

Scientific name	Common name
<b>Animals</b>	
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Ardea alba</i>	Great egret
<i>Aspidoscelis tigris munda</i>	Western (California)whiptail
<i>Bubo virginianus</i>	Great horned owl
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Callipepla californica</i>	California quail
<i>Canis latrans</i>	Coyote
<i>Charadrius vociferus</i>	Killdeer
<i>Corvus corax</i>	Common raven
<i>Geococcyx californianus</i>	Greater roadrunner
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Lepus californicus</i>	Black-tailed jackrabbit
<i>Sturnella neglecta</i>	Western meadowlark
<i>Sylvilagus audoboni</i>	Desert cottontail
<i>Tyrannus verticalis</i>	Western kingbird
<i>Uta stansburiana</i>	Western side-blotched lizard
<i>Zenaida macroura</i>	Mourning dove

**Table 3.** Plant Species Observed during Biological Surveys

Scientific name	Common name
<b>Plants</b>	
<i>Acroptilon repens</i>	Russian knapweed
<i>Atriplex lentiformis ssp. lentiformis</i>	Big saltbush
<i>Atriplex polycarpa</i>	Allscale
<i>Bromus madritensis ssp. rubens</i>	Red brome
<i>Bromus diandrus</i>	Ripgut brome
<i>Centaurea melitensis</i>	Tocalote
<i>Chenopodium album</i>	Lambsquarters
<i>Convolvulus arvensis</i>	Field bindweed
<i>Erodium cicutarium</i>	Redstem filaree
<i>Datura wrightii</i>	Sacred thorn-apple
<i>Distichlis spicata</i>	Saltgrass
<i>Helianthus annuus</i>	Annual sunflower
<i>Heliotropium curassavicum</i>	Alkali heliotrope
<i>Heterotheca grandiflora</i>	Telegraphplant
<i>Lactuca serriola</i>	Prickly lettuce
<i>Malvella leprosa</i>	Alkali sida
<i>Polypogon monspeliensis</i>	Rabbitfoot polypogon
<i>Portulaca oleracea</i>	Common purslane
<i>Rumex crispus</i>	Curly dock
<i>Salix sp.</i>	Willow
<i>Salsola tragus</i>	Russian thistle
<i>Senecio vulgaris</i>	Common groundsel
<i>Sisymbrium altissimum</i>	Tall tumbled mustard
<i>Solanum elaeagnifolium</i>	Silver-leaved nightshade
<i>Sonchus olearceus</i>	Annual sowthistle
<i>Stephanomeria pauciflora</i>	Wire lettuce
<i>Suaeda nigra (=S. moquinii)</i>	Bush seepweed
<i>Tamarix</i>	Salt cedar
<i>Typha latifolia</i>	Common cattail
<i>Xanthium strumarium</i>	Common cocklebur

### Natural Lands

No USFWS designated critical habitat is present in the proposed project site (USFWS 2015a). No perennial or intermittent streams, designated wetlands, vernal pools, or other sensitive habitats were observed within the boundaries of the proposed project site. Natural lands are present in the buffer area south and east of the proposed project site. The following vegetation alliances were observed in natural lands in the buffer area surrounding the proposed Palms Project:

- |                                     |                               |
|-------------------------------------|-------------------------------|
| • Bromus rubens-Semi-Natural Stands | Bromus rubens Alliance        |
| • Quailbush Scrub                   | Atriplex lentiformis Alliance |
| • Allscale Scrub                    | Atriplex polycarpa Alliance   |
| • Bush Seepweed Scrub               | Suaeda nigra Alliance         |
| • Cattail Marsh                     | Typha Alliance                |
| • Tamarisk Shrubland Stand          | Tamarix spp.                  |
| • Willow Thicket                    | Salix Alliance                |



Three (3) rare communities were identified in the CNDDDB in proximity to the proposed project site; these include Valley Sink Scrub, Valley Saltbush Scrub, and Great Valley Mesquite Scrub (CDFW 2015a). Valley Sink Scrub is documented in the CNDDDB approximately 3.6 miles northeast of the project site, at the Junction of Interstate 5 and Stockdale Highway. Valley Saltbush Scrub and Great Valley Mesquite habitats are recorded in the CNDDDB approximately 3.1 miles northeast of the project site (CDFW 2015a). These rare community types (vegetation alliances) persist in areas of natural topography in the western San Joaquin Valley, mainly in areas that have not been developed or converted to agricultural use. As a result, many special-status wildlife and plant species have been documented in and presumably continue to occupy such areas.

Natural lands observed during biological surveys were present in the buffer area south of the project site, in uncultivated areas along the California Aqueduct, and to the east, on the adjacent Tule Elk State Natural Reserve. In addition, riparian vegetation comprised primarily of cottonwood and willow is present southeast of the project site, along the Outlet Canal. As proposed, the Palms Project would not result in surface disturbance to sensitive habitats or other natural lands.

## **SPECIAL-STATUS BIOLOGICAL RESOURCES**

Through a literature review and an electronic search of the CNDDDB (CDFW 2015) and CNPS Inventory (CNPS 2015), a total of 50 special-status species were identified that occur in or may be affected by projects in the East Elk Hills and Tupman quadrangles (an area measuring approximately 140 square miles). The USFWS IPaC report obtained for the project site identified an 15 migratory birds which were not included on the CNDDDB species lists. Each of these species are discussed below.

### **AMPHIBIANS**

**California Red-Legged Frog** is the largest native frog in the western United States, ranging from 1.75 to 5.25 inches from snout to vent (Stebbins 2003). The California red-legged frog can appear brown, gray, olive, red, or orange above with a pattern of dark spots or flecks. The hind legs are well developed, with large webbed feet. Adult frogs have white on the underside, with patches of bright red or orange on the hind legs and abdomen.

The California red-legged frog is listed as a federal Threatened species and is a CDFW Species of Special Concern (SSC). The species requires a variety of habitat elements, with aquatic breeding areas within a matrix of riparian and upland dispersal habitats (USFWS 2015b). Breeding occurs from November through March. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails are considered optimal habitat; however the species has been found in ephemeral creeks and drainages, and in ponds that do not support riparian vegetation. Accessibility to sheltering habitat is essential for red-legged frogs, and can be a limiting factor in its distribution.

Historically distributed along the coast from Marin County and inland from Shasta County, south to northwestern Baja California, the species is currently known to occur in only a few drainages

in the Sierra Nevada foothills, compared to more than 60 historical records (USFWS 2015b). In southern California, the species has essentially disappeared from the Los Angeles area south to the Mexican border; the only known population in Los Angeles County is on the Angeles National Forest, in San Francisquito Canyon. A recovery plan for the California red-legged frog was published on May 28, 2002. Designated critical habitat for this species was revised and a final rule was published on March 17, 2010.

The proposed project site is located outside the current known range and distribution of the species. Furthermore, the proposed project site is not located in an area that has been designated as critical habitat for the species (USFWS 2015b). No aquatic breeding habitat is present in the proposed project site or buffer area. No suitable upland aestivation habitat is present within the boundaries of the proposed project site. No individuals were observed during biological surveys. California red-legged frogs have not been documented in the proposed project site or within a 1-mile radius (CDFW 2015a). Since the proposed project is located outside the known range of the species, California red-legged frogs are not expected to be present or become established in the proposed project site.

## **BIRDS**

**Tricolored Blackbird** is mostly a resident in California and is common throughout the Central Valley. The species breeds near freshwater, generally in emergent wetlands that support tall, dense cattails and/or tules. This highly colonial species requires open water, protected nesting substrate, and a foraging area with insect prey within a few miles of the colony. Tricolored blackbirds feed in grassland, cropland, and along the edges of ponds.

No suitable aquatic or nesting habitat was observed in the proposed project site or buffer area; however, potential foraging habitat for tricolored blackbird is present in the project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of the proposed project site (see Figure 3a). Tricolored blackbird has been recorded 2.3 miles southeast of the project site and 7.0 miles to the east (CDFW 2015a). The species may occasionally fly over and/or forage in the project site; however, the tricolored blackbird is not expected to become established or to nest in the proposed project site based on a lack of suitable nesting (wetland) habitat.

**Bell's Sparrow** is a small, gray-headed sparrow with a relatively long dark tail. These inconspicuous birds spend much of their time on the ground or concealed in shrubs. Bell's sparrow occurs in desert, shrubland, and chaparral habitats, and is often found in association with sagebrush (*Artemisia* sp.) or saltbush (*Atriplex* sp.). These birds feed on insects, spiders, and seeds.

No suitable habitat is present in the proposed project site. Potential foraging and nesting habitat was observed in the buffer area, south of the proposed project boundary. No individuals were observed during biological surveys. This species has not been documented in the CNDDDB within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Bell's sparrow may be present in the buffer area south of the proposed project site, in an area of habitat adjacent to the California Aqueduct. The species may occasionally fly over the project site;

however, Bell's sparrow is not expected to forage, become established, or to nest in the proposed project site based on a lack of suitable foraging and nesting habitat.

**Short-Eared Owl** is a medium-sized owl with a large, round head. These ground-nesting owls require large expanses of open grassland for foraging and are the most widely distributed species of owl in the world. They fly low to the ground, preying on small mammals, and require an abundance of prey, as they are active both day and night.

Overwinter, potential habitat is present in the proposed project site; however, prey would be considered limited in the project site based on a lack of small mammal burrows that would support a suitable prey base. Potential habitat was observed in the buffer area, and in natural lands outside the proposed project boundaries (south along the California Aqueduct and Elk Hills Oil Field, and east at the Tule Elk State Natural Reserve. No individuals were observed during biological surveys. The species has not been documented in the CNDDDB within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Short-eared owls may forage in the project site and buffer area; however, the species is not expected to become established or to nest in the proposed project site since the project is located outside the species' current nesting range.

**Western Burrowing Owl** is a ground dwelling owl that occurs in grassland habitats. Burrowing owls typically uses burrows of small mammals and large rodents, particularly California ground squirrels, for shelter and breeding. The species is listed by the USFWS as a Bird of Conservation Concern (BCC) and by the CDFW as a Species of Special Concern (SSC).

Potential habitat is present in undisturbed/uncultivated areas south and east of the project site. Furthermore, agricultural lands in the proposed project site may be used as foraging habitat. No individual burrowing owls, occupied burrows, or sign of their presence (i.e., whitewash, castings, feathers, etc.) were identified during biological surveys. The species has not been recorded within the boundaries of the proposed project site, but is known to occur in the general area (see Figure 3a). Numerous sightings of burrowing owls and several active burrows have been documented south of the project site, in Valley Saltbush Scrub habitat along the California Aqueduct. The species is also known to occur east of the project site, on the Tule Elk State Natural Reserve (CDFW 2015a). Burrowing owls may fly over and/or forage in the project site; however, based on a lack of potential burrows and suitable nesting habitat, the species is not expected to become established or nest in the project site.

**Swainson's Hawk** is a large, broad winged hawk with a four (4) foot wing span. Body plumage is characterized by three color phases: light, dark, and rufous. Sexes are similar in appearance and these birds display a dark "bib" from the lower throat to the upper breast. Their wing tips are pointed and they have light colored wing linings.

The Swainson's hawk migrates long distances to areas in South America including Argentina, Uruguay, and Southern Brazil. During fall and winter migration, groups of 100+ individual Swainson's hawks have been documented gathering at critical foraging sites in Yolo, Tulare, Kern, and San Joaquin Counties (CDFG 1994). Nesting grounds occur in northwestern Canada, western U.S., and Mexico. Nest trees used by Swainson's hawk generally range from 40 to 82

feet in height, however the species has been documented nesting at lower heights in mesquite and tamarisk shrubs. Valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii*), sycamore (*Platanus* spp.), walnut (*Juglans hindsii*), and willow (*Salix* spp.) are the most commonly used types of nest-tree (CDFG 1988 and 1994).

The species nests throughout the Central Valley, although nesting habitat has been greatly reduced and remains fragmented. The species breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, and agricultural or ranch lands with tree lines or groves of trees (CDFW 2015a). Cropping patterns and agricultural practices greatly influence the species' distribution and abundance in the Valley. Swainson's hawks require suitable foraging adjacent to nest sites such as grasslands, alfalfa, grain fields, etc. that support rodent populations. Prey items include pocket gophers, deer mice, California ground squirrel, California voles, burrowing owls, mourning doves, meadowlarks, grasshoppers, crickets, beetles, and other insects.

The species has been documented in telemetry studies foraging up to ten miles away from active nest sites (Estep 1989, Babcock 1993). Preferred foraging habitats for Swainson's hawk include alfalfa, fallow fields, beets, tomato, and other low-growing field crops, dry-land and irrigated pasture, rice land (during the non-flooded period), and cereal grain crops (including corn after harvest) (CDFG 1994). Crops that are incompatible for foraging Swainson's hawks include, cotton, orchards, and vineyards. These crop types are not suitable for foraging due to the density of vegetative cover, frequency and/or intensity of their cultivation, and lack of available prey. Any crop type that does not support an adequate prey population would be unsuitable foraging habitat for Swainson's hawk.

The Swainson's hawk is a California State threatened species. Historically, the species was considered one of the most common raptors in the state. Population declines are attributed to loss of native nesting (riparian) and foraging habitat. The species continues to be threatened by the loss of suitable nesting trees and conversion of agricultural crops to those that are unsuitable for foraging by Swainson's hawks.

No suitable nesting habitat is present within the boundaries of the proposed project site. No potential nest trees were observed in the proposed project site and no trees would be removed or otherwise impacted in the project site during project implementation. No nests (active or inactive) were observed in the proposed project site or within a 0.5 mile radius during biological surveys. Potential roosting and nesting habitat was observed outside the project boundaries, in areas that support riparian vegetation, along the Outlet Canal to the south and the Tule Elk State Natural Reserve to the east. Potential foraging habitat is present in the project site and buffer area, in areas of agriculture planted to suitable crops (alfalfa, etc.). Adjacent agricultural lands planted to cotton and pistachios are unsuitable for Swainson's hawk and do not represent potential foraging habitat. While no individuals were observed during biological surveys, Swainson's hawks have been documented 0.7 miles and 5.6 miles to the east, on the Tule Elk State Natural Reserve, and Kern Water Bank Authority lands, respectively (CDFW 2015a). Swainson's hawk may potentially roost and/or establish nest site(s) in riparian areas adjacent to or in proximity to the proposed project site. In addition, the species may forage in agricultural fields planted to crops that are suitable for foraging (alfalfa) near the proposed project site. The species is not expected to nest in the project site based on a lack of suitable nesting habitat.

**Costa's Hummingbird** is a small desert hummingbird with green upper parts. Male birds display a violet crown and throat, while female birds have a white throat and under parts, and sometimes violet feathers. The species occurs in desert, foothill, and chaparral communities and breeds in the Mojave and Sonoran Deserts of California and Arizona. Nests are typically placed in shrubs.

Potential habitat is present in the buffer area, south and east of the proposed project site; however, no suitable (nesting) habitat is present in the proposed project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Costa's hummingbirds may fly over and/or forage in the project site; however, the species is not expected to become established or nest in the proposed project site based on a lack of suitable nesting habitat.

**Cactus Wren** occurs in deserts of the southwest. Limited to regions where thorny bushes or trees offer nesting sites. The species typically nests along gravelly watercourses and is known to occur sunny hillsides of mesas next to mountains.

The project site is outside the known range and current year-round distribution of the species. Furthermore, no suitable habitat for cactus wren is present in the proposed project site or buffer area. Cactus wrens are not expected to be present or become established in the proposed project site since the project is located outside the species' current range and lacks suitable habitat for the species.

**Mountain Plover** does not breed in California, but is found in the winter in the Central Valley south of Yuba County; along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego counties; and parts of Imperial, Riverside, Kern, and Los Angeles counties. Wintering mountain plovers are gregarious, forming loose foraging and roosting flocks reported as ranging in size from four (4) to more than 1,000 individuals (Hunting and Fitton 1999). During the winter, mountain plovers can be found foraging in open plains or rolling hills with short grasses or very sparse vegetation (including disked agriculture fields). This species is adapted to the natural grazing and fire regimes of the historic Great Plains and western valleys (Hunting 2000). At both their breeding and wintering sites, mountain plovers are generally associated with grasslands that include areas of bare ground. Grasslands on alkali soils or that have been recently burned, heavily grazed by domestic livestock, disked, or populated with fossorial mammals such as California ground squirrels (*Spermophilus beecheyi*) are known to be especially attractive to the species (Knopf and Rupert 1995, CPIF 2000). The mountain plover is less often associated with grasslands where the vegetation has not been grazed or mowed, or has become too tall (USFWS 1999).

This species has been recorded 0.6 miles east of the proposed project site (see Figure 3a). Mountain plover has also been documented 0.9 miles east of Tupman Road, on the Tule Elk State Natural Reserve (CDFW 2015a). Potential foraging habitat is present in the project site and buffer area. Potential habitat is also present in natural lands in vicinity to the project site, including the Elk Hills Oil Field to the south and the Tule Elk State Natural Reserve to the east.

No individuals were observed during biological surveys. The species may forage in the project site and buffer area overwinter, but is not expected to breed or nest in the project site, as it is located outside the known range for breeding and nesting.

**Peregrine Falcon**, the largest falcon in North America, is characterized by long pointed wings and powerful fast flight. These falcons are blue-gray above with barred underparts and thick sideburns. Peregrine falcons prey on medium-sized birds in flight, such as pigeons, and feed on shorebirds and ducks. They are more common along coasts, and can be found perching or nesting on cliffs, water towers, skyscrapers, and other tall structures.

Potential roosting and nesting habitat (palm trees, agricultural tanks, etc.) are present in the proposed project site; however, no suitable foraging habitat was observed. Forage in the project site would be considered limited based on a lack of suitable prey. No individuals or evidence of the species were observed during biological surveys. Peregrine falcon has not been documented in the CNDDDB within the boundaries of or in proximity to the proposed project site (CDFW 2015a). There is potential for the species to be present in the project site, where tall features offer potential roost sites; however, the species is not expected to become established in the project site based on a lack of suitable forage for the species.

**Bald Eagle** is a large raptor with a dark brown body and white head. These birds occur near lakes, rivers, reservoirs, marshes, and coasts. Bald eagles prefer tall, mature coniferous or deciduous trees for perching and nest in forested areas near large bodies of water. In winter, these birds may be seen in dry, open uplands if there is access to open water for fishing. Bald eagles typically steal fish from osprey or mammals, rather than catching it for themselves. Although once endangered by hunting and pesticide use, bald eagles have flourished under protection.

No suitable nesting or foraging habitat is present in the proposed project site and buffer area. No potential roosts or individuals were observed during biological surveys. No individual bald eagles were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat for the species, bald eagles are not expected to be present or become established in the proposed project site.

**Least Bittern** is a year-round resident of freshwater marshes. These birds occur along the borders of ponds and reservoirs that provide ample cover. Nests are usually placed in tules, cattails, and bulrushes, generally over water.

No suitable habitat is present in the proposed project site or buffer area. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat for the species, least bitterns are not expected to occur in the proposed project site.

**Loggerhead Shrike** is a common resident in the lowlands and foothills throughout California. The species occurs in valley foothill hardwood, valley foothill riparian, pinyon-juniper woodland, and desert riparian habitats. Loggerhead shrikes prefer open habitats with scattered shrubs or trees for cover, and posts, fences, or other areas for perching. The species nests in

dense shrub or tree foliage; nests are generally constructed on branches 1 to 50 feet above the ground. These birds feed primarily on large insects, and will consume small birds, lizards, mammals, fish, carrion, and various invertebrates. Shrikes are known to skewer their prey items on sharp items including twigs or barbed wire fences.

Potential foraging habitat is present in the project site and buffer area. No suitable nesting habitat is present in the proposed project site; however potential nesting habitat was observed in the buffer area south of the proposed project site, along the California Aqueduct. The species has not been documented in the CNDDDB within the boundaries of the proposed project site (CDFW 2015a), but an individual loggerhead shrike was observed perched overhead on a power line in the project site during biological surveys. While the species may forage in the project site, forage may be limited, as pesticide use in agricultural areas may reduce food availability. Loggerhead shrikes are not expected to become established or nest in the proposed project site based on a lack of suitable (nesting) habitat.

**Marbled Godwit** is a large shorebird that occurs in wetland, riparian, tidal flat, and sand dune habitats. These birds are often found in open shallow water along shorelines. The marbled godwit feeds on crustaceans, mollusks, worms, grasshoppers, and other insects, and on seeds and tubers.

No suitable habitat is present in the proposed project site or buffer area. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat for the species, marbled godwits are not expected to occur in the proposed project site.

**Lewis's Woodpecker** is a dark, medium-sized woodpecker with greenish black head, wings, and tail, and a dark red face. These woodpeckers occur in open woodland habitats and need trees for cavity nesting. This species of woodpecker feeds in flight or gleans insects from the tree surface, rather than excavating wood for boring insects.

No suitable habitat is present in the proposed project site or buffer area. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat for the species, Lewis's woodpeckers are not expected to occur in the proposed project site.

**Long-Billed Curlew** is a large brown shorebird characterized by its long, down-curved bill. These birds occur in sparse, short-grassland habitats and agricultural fields. In winter, long-billed curlews migrate to the coast and interior Mexico, in wetlands, tidal estuaries, mudflats, and flooded fields. During March and April, the species migrates north from wintering grounds. These large shorebirds feed mainly on insects (grasshoppers, beetles), earthworms, marine crustaceans (shrimp), and marine invertebrates.

The proposed project site is located outside the known breeding range of the species. Potential foraging habitat (agricultural fields) is present in the proposed project site and buffer area. No individuals were observed during biological surveys. The species has not been documented



within the boundaries of or in proximity to the proposed project site (CDFW 2015a). While the species may forage in the project site during periods of winter migration, long-billed curlews are not expected to breed or nest in the proposed project site since it is not within the known range of the species.

**Fox Sparrow** is a dark, splotchy colored sparrow that occurs in dense thickets. These birds occur in remote areas of coniferous forest, and mountain scrub. These sparrows may be seen over winter in tall chaparral, scrub, and forest habitats, generally foraging on the ground and in leaf litter for insect prey.

No suitable habitat is present in the proposed project site; however the species may forage in the buffer area. No individuals were observed during biological surveys. The species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). While the species may potentially forage in the buffer area, the fox sparrow is not expected to be present or become established in the proposed project site based on a lack of suitable habitat and current land use.

**Nuttall's Woodpecker** is a small black and white woodpecker. These birds are confined to the oak woodlands of and riparian areas in California, and are rarely found in conifers. Trees are required for cavity nesting. This species of woodpecker consumes insects and arthropods, and occasionally fruit, but does not feed on acorns.

No suitable habitat is present in the proposed project site and buffer area. No individuals were observed during biological surveys. The species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat, Nuttall's woodpecker is not expected to be present or become established in the proposed project site.

**Brewer's Sparrow** is a small grayish brown sparrow with few distinct markings. These sparrows occur in arid scrub and desert grasslands, and are often found in association with big sagebrush (*Artemisia tridentata*) and other large sagebrush species (>5 feet tall), including saltbush (*Atriplex* sp.), and creosote. The species forages in shrubs and on the ground, and feeds on insects, including grasshoppers, ants, beetles, and spiders.

No suitable habitat is present in the proposed project site. However, potential foraging habitat is present in the buffer area south and east of the proposed project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). While the species may potentially forage in the buffer area, Brewer's sparrow is not expected to be present or become established in the proposed project site based on a lack of suitable habitat, the

**California Spotted Owl** is a large owl with mottled brown chest coloring, a round head, and no ear tufts. This is one of three subspecies of spotted owl, found only in California. The California spotted-owl occurs in old-growth coniferous and other mature forests, and rocky canyons. Spotted-owls typically require trees for nesting, as they are cavity nesters. These birds hunt at

night, feeding on small mammals; woodrats, flying squirrels, and bats are important components of their diet.

The proposed project site is located outside the known range of the species. Furthermore, no suitable habitat is present in the proposed project site and buffer area. The species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Based on a lack of suitable habitat, California spotted owls are not expected to be present or become established in the proposed project site.

**Le Conte's Thrasher** is an uncommon to rare resident in southern California deserts and in western and southern San Joaquin Valley. Although formerly found north to Fresno County, the species has been rarely recorded north of Kern County since the 1950s. The species occurs in open desert wash, desert scrub and succulent shrub, and alkali desert scrub habitats. Le Conte's thrasher use scattered (saltbush) shrubs for cover and dense, spiny shrubs for nesting. These birds feed mainly on small lizards and insects by probing the ground and digging in the soil.

Le Conte's thrasher has been recorded in the buffer area, southeast of the proposed project (see Figure 3a). The species was documented approximately 0.3 miles to the southeast (CDFW 2015a). No suitable habitat was observed in the project site. However, potential (nesting) habitat for this species is present in the buffer area south and east of the proposed project site, in areas that support a shrub component. No individuals were identified in the project site or buffer area during biological surveys. Where natural lands persist, with adequate shrub cover for nesting, the species would be expected to occur. While the species may fly over and/or forage in the project site, Le Conte's thrashers are not expected to become established or to nest in the project site based on a lack of suitable (nesting) habitat.

**Least Bell's Vireo** inhabits low dense riparian vegetation along water or dry parts of intermittent streams. The species is typically associated with willow, cottonwood, baccharis, wild blackberry, or mesquite in desert locations.

The proposed project site is located outside the known range and current distribution of the species (USFWS 2006). While potential habitat is present in the buffer area to the southeast, mainly along the Outlet Canal, no suitable habitat is present in the proposed project site. No individuals were observed during biological surveys. This species has not been documented within the boundaries of the proposed project site (see Figure 3a). Least Bell's vireo was historically recorded 5.3 miles south of the project site (CDFW 2015a).

## **INVERTEBRATES**

**Vernal Pool Fairy Shrimp** are short-lived crustaceans that occur in small vernal pools of California. Their habitats form when winter rains fill shallow depression; pools persist for months and then evaporate in the spring. This species is known to inhabit clear-water sandstone depression and grassland swale pools. They are generally 0.5-1.5 inches long and are fairly translucent. Their life span is from December to early May, and is often temperature dependent. They feed on algae, bacteria and detritus and are consumed by birds, reptiles, and amphibians.

Eggs are laid by adult shrimp each winter season; however, eggs may lie dormant in the soil for up to ten (10) years before hatching.

Vernal pool fairy shrimp are endemic to grasslands of the Central Valley, and the Central and South Coast mountains. The species has been found throughout the Central Valley, from Shasta County to Tulare County, along the Coast Range from Solano to San Luis Obispo and Santa Barbara Counties, and in southern California in Riverside and San Diego Counties. Vernal pool fairy shrimp is listed as a federal threatened species.

No suitable habitat (vernal pools) was observed in the proposed project site. Since the proposed project site is under agricultural production, vernal pool fairy shrimp are not expected to occur or become established in the project site.

## **FISH**

**Delta Smelt** is a slender-bodied fish feed on small free-floating crustaceans and occasionally insect larvae. The species requires shallow open waters with freshwater flow and specific conditions (i.e., salinity and temperature) for spawning, rearing, etc. Delta smelt are restricted to the San Francisco Bay and Sacramento-San Joaquin Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties in California.

The proposed project site is located outside the known distribution and current range of the species (USFWS 2015a). Furthermore, no suitable aquatic habitat is present in the proposed project site or buffer area. Delta smelt has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a). Since the Palms Project is proposed in active agriculture and lacks suitable habitat for the species, Delta smelt are not expected to occur in the project site.

## **MAMMALS**

**San Joaquin (Nelson's) Antelope Squirrel** is listed as a State threatened species. The species historically occurred in the western and southern portions of the Tulare Basin, San Joaquin Valley, and contiguous areas to the west in the upper Cuyama Valley, and on the Carrizo and Elkhorn Plains (USFWS 1998). However, the current distribution is extremely fragmented due to agricultural conversions that have occurred during the last century. Thus, substantial populations now occur only around Lokern and Elk Hills in western Kern County, and on the Carrizo and Elkhorn plains in southeastern San Luis Obispo County. Within its occupied range the species inhabits arid annual grassland and shrubland communities and is most numerous in areas with a sparse to moderate cover of shrubs. Occupied habitat also typically occurs on open, gentle slopes with friable soils. Areas with high water tables, steep slopes, or broken, rocky upland terrain appear to be avoided by the species (USFWS 1998). Habitats that are considered fair to good in quality typically support between 3 and 10 antelope squirrels per acre (USFWS 1998). The species is primarily diurnal and may be active throughout the day.

No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area,

south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, south along the California Aqueduct, and the Elk Hills Oilfield, southeast along the Outlet Canal, and east at the Tule Elk State Natural Reserve. No San Joaquin antelope squirrels were observed during biological surveys. The species has not been documented in the project site (see Figure 3a). The species has been recorded approximately 0.2 miles east on the Tule Elk State Natural Reserve and 0.3 miles to the south (CDFW 2015a). San Joaquin antelope squirrel is expected to be persist in areas of natural land; however, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the species is not expected to become established in the project site.

**Giant Kangaroo Rat** is listed as a federal and State endangered species. Giant kangaroo rats prefer annual grassland on gentle slopes of generally less than 10 percent with friable, sandy-loam soils. However, most remaining populations are on poorer, marginal habitats which include shrub communities on a variety of soil types and slopes up to 22 percent. The historical distribution of the species encompasses a narrow band of gently sloping ground along the western edge of the San Joaquin Valley, with occasional colonies on steeper slopes and ridge tops, from the base of the Tehachapi Mountains in Kern County along the western edge of the valley to near Los Banos in Merced County. The species' occupied range is currently fragmented into six major geographic units that include the Panoche Region in western Fresno and eastern San Benito counties; Kettleman Hills in Kings County; San Juan Creek Valley in San Luis Obispo County; western Kern County in the area of the Lokern, Elk Hills, and other uplands around McKittrick, Taft, and Maricopa; Carrizo Plain National Monument in eastern San Luis Obispo County; and Cuyama Valley in Santa Barbara and San Luis Obispo Counties.

Giant kangaroo rats are primarily seedeaters, but also eat green plants and insects. They cut the ripening heads of grasses and forbs and cure them in small surface pits located on the area over their burrow system (Shaw 1934, Williams *et al.* 1993). They also gather individual seeds scattered over the surface of the ground and mixed in the upper layer of soil. Surface pits are uniform in diameter and depth (about 1 inch), placed vertically in firm soil, and filled with seedpods. After placing seeds and seed heads in pits, the animal covers them with a layer of loose, dry dirt. Pits are filled with the contents of the cheek pouches after a single trip to harvest seeds. Before being moved underground, the seeds are sun-dried which prevents molding (Shaw 1934). Individuals in many populations also make large stacks of seed heads (i.e., haystacks) on the surface of their burrow systems (Hawbecker 1944, Williams *et al.* 1993). The material is cured and then stored underground. Amounts cached in haystacks may not correspond with annual herbaceous productivity. Estimated home range size ranges from about 646 to 3,768 square feet. There is no significant difference in size of home range between sexes. The core area of the territory, located over the burrow system (i.e., precinct) is the most intensely used location in the home range (Braun 1985). Grinnell (1932) and Shaw (1934) suggested that territories were occupied by a single animal. More recent studies indicate that multiple individuals may live in a precinct. These individuals appear to be family groups of females and offspring of different ages (Randall 1997). Estimates of density, employing both trapping and counts of precincts, ranged from 1 to 44 individuals per acre (Grinnell 1932, Braun 1985, Williams 1992).

Giant kangaroo rat burrow systems (precincts) are distinctive because of the size and orientation of the individual entrances and the presence of cleared vegetation in the vicinity of the system. Precincts may include one to several burrow openings and a colony may consist of two to thousands of precincts. Burrows of two types may be observed within the precincts. Horizontal burrow openings are typical in appearance compared to other kangaroo rats. However, these openings are usually quite large in comparison to the burrow openings of other species. Giant kangaroo rats also may construct vertical burrow openings. Other characteristics of giant kangaroo rat precincts include tracks from their distinctively large feet and tail drags, haystacks near the burrows, and large scat near the burrow entrances. Individual precincts are usually connected to other precincts by well-worn paths and are relatively easy to detect, even from a distance (Williams 1980).

No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No sign of giant kangaroo rat presence (i.e., mowing, hay stacking, seed caching, vertical burrow entrances, etc.) was identified during biological surveys. This species has not been documented within the boundaries the proposed project site (see Figure 3a). The nearest occurrence of giant kangaroo rat to the project site is recorded 0.8 miles to the southwest, on the south side of the California Aqueduct (CDFW 2015a). Giant kangaroo rat is expected to be present in areas of natural land; however, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the species is not expected to become established in the project site.

**Short-nosed Kangaroo Rat** is a California species of concern. This species is one of three subspecies of the San Joaquin kangaroo rat. The short-nosed kangaroo rat uses grassland habitats, as well as desert scrub associations, especially *Atriplex* (CDFW 2014). This species has also been found along levees and could occur in agricultural areas.

No suitable habitat for the species was observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. This species has not been documented within the boundaries the proposed project site (see Figure 3a). Short-nosed kangaroo rats have been recorded 4.1 miles south and southeast of the proposed project site (CDFW 2015a). Short-nosed kangaroo rat is expected to be present in areas of natural land; however, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the species is not expected to be present or become established in the project site.

**Tipton Kangaroo Rat** is one of three subspecies of the San Joaquin kangaroo rat. This species can be distinguished from the other species within their range by the presence of four toes on the hind feet, as opposed to five toes. The species occurs in saltbush scrub and sink scrub habitats in the Tulare Lake Basin of the southern San Joaquin Valley. This species needs soft, friable soils

that escape seasonal flooding (CDFW 2015). Tipton kangaroo rats often dig burrows at the bases of shrubs.

Historically, Tipton kangaroo rats were distributed on the Valley floor; the western extent of their range was marshes and the Buena Vista and Kern lakes (USFWS 2010 and USFWS 1998). Tipton kangaroo rat is known to occur in limited scattered areas, located east of the California Aqueduct. Due to agricultural development, water diversion, and storage, much of the area in proximity to the project sites is unsuitable for the species.

The species has been (historically) documented in the buffer area of the project site (see Figure 3a). Tipton kangaroo rats have been recorded 0.1 mile east of the project site, on the Tule Elk State Natural Reserve, and in locations 5 miles to the southeast and 7 miles to the northeast (CDFW 2015a). No suitable habitat or small mammal burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Coles Levee Ecosystem Preserve. Tipton kangaroo rat is expected to be present in areas of natural land, particularly in areas that avoid seasonal flooding. However, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the species is not expected to be present or become established in the project site.

**Tulare grasshopper mouse** historically ranged from western Merced County and eastern San Benito County east to Madera County and south to the Tehachapi Mountains. Current distribution of the species includes the western margin of the Tulare Basin (including western Kern County), Carrizo Plain National Monument, the Cuyama Valley side of the Caliente Mountains, eastern San Luis Obispo County, and Ciervo-Panoche Region in Fresno and San Benito Counties. The taxon typically inhabits hot, arid grassland and shrub land vegetation communities (e.g., alkali sink, saltbush scrub, and mesquite scrub). It has also been recorded in blue oak woodland, where it is considered very rare. Little more is known about the habitat requirements of the taxon. However, its distribution generally follows that of other special-status species associated with arid habitats in the San Joaquin Valley, Cuyama Valley, and Carrizo Plain (i.e., San Joaquin kit fox and giant kangaroo rat).

No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. As illustrated in Figure 3a, the species has not been recorded in the project site (CDFW 2015a). This species is expected to be present in areas of natural land; however, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the Tulare grasshopper mouse is not expected to be present or become established in the project site.

**San Joaquin Pocket Mouse** is listed as a CDFW Species of Special Concern (SSC). The species occurs in dry, open grassland and scrub habitats in the Central and Salinas Valleys of

California, and feeds primarily on seeds from grasses and shrubs. San Joaquin pocket mice hibernate in their burrows most of the year and are active only at night during the spring and summer.

No suitable habitat or small mammal burrows suitable for use by this species were observed within the boundaries of the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. The species has not been recorded in the project site (see Figure 3a). San Joaquin pocket mouse has been documented 0.2 miles to the east, on the Tule Elk State Natural Reserve (CDFW 2015a). This species is expected to be present in areas of natural land; however, based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the San Joaquin pocket mouse is not expected to be present or become established in the project site.

**Buena Vista Lake Ornate Shrew** lives in dense vegetation around the perimeter of marshes, lakes or sloughs. Prefers moist soil and uses stumps, logs, and litter for cover. The Buena Vista Lake shrew formerly occupied wetlands and marshlands that occurred around Buena Vista Lake and in the Tulare Basin (USFWS 1998). However, its range has become very restricted due to the loss of lakes sloughs, and riparian areas. This species was federally listed as endangered in 2002 and its recovery was initially addressed in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The USFWS designated Critical habitat for this species in a final rule that was published on July 2, 2013 (USFWS 2013a).

The proposed project does not occur in an area that has been designated by the USFWS as critical habitat for the Buena Vista Lake ornate shrew (USFWS 2015a, 2015b). No suitable habitat for Buena Vista Lake ornate shrew was observed in the proposed project site; the project site lacks habitat features that are required by the shrew. Riparian habitat that may serve as potential for this species is present to the southeast, outside the proposed project site, along the Outlet Canal. The species has not been documented within the boundaries of the proposed project site (see Figure 3a). Buena Vista Lake shrew has been recorded approximately 2.7 miles southeast of the proposed project site (CDFW 2015a). Based on a lack of suitable habitat in the project site and conditions observed during biological surveys, the Buena Vista Lake ornate shrew is not expected to be present or become established in the project site.

**American Badger** (*Taxidea taxus*) is widespread across the drier portions of the western United States where suitable habitat is characterized by most open vegetation communities with dry, friable soils. These include grassland and shrub communities, and open stages of some woodland communities. Badgers mate in summer and early fall, and most young are born in March and April (Long 1973). The most common signs of habitat occupation by badgers include dens and fresh diggings. Badger dens exhibit characteristics that are diagnostic of the species (e.g., dome-shaped entrance with claw marks in the upper portion of the entrance).

No suitable habitat for the species was observed in the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California



Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows that were of appropriate size for use by badger or sign (i.e., scat, tracks, digging, prey remains, etc.) of the species were observed during biological surveys. Badgers have been documented approximately 4.6 miles southeast and 5.8 miles east of the project site (CDFW 2015a). Although no burrows suitable for potential denning were observed within the proposed project sites at the time of our field surveys, it is possible that badgers may travel through and/or forage in the proposed project site. Forage, however, would be limited in the project site based on a lack of small mammal burrows that would support a suitable prey base for the species.

**San Joaquin Kit Fox** historically occurred throughout the southern portion of the San Joaquin Valley, along the eastern edge of the San Joaquin Valley, and in the dry interior valleys of the Coast Ranges. The species occurs in a variety of open grassland, oak savannah, and shrub vegetation communities. However, in the southern portion of its range it is generally found in sparse annual grassland and scrub communities (e.g., valley sink scrub, saltbush scrub). Den characteristics of the subspecies vary across its range. In the southern portion of its range the taxon often creates dens with two entrances; natal/pupping dens typically have multiple entrances. Entrances range from 8 to 10 inches in diameter and are normally higher than wide, but kit foxes can utilize dens with entrances as small as four inches in diameter. Kit foxes often change dens on a regular basis. Home ranges for the taxon have been reported by several authors to range from 1 to 12 square miles (USFWS 1998).

Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. While no suitable habitat for the species was observed in the proposed project site, agricultural lands may serve as foraging habitat for the species. No individual San Joaquin kit fox were observed however tracks were identified during biological surveys in an existing roadway. No known or potential dens, or other sign (i.e., scat, digging, prey remains, etc.) of kit fox activity was detected. Numerous sightings of individual kit fox (including road kills), and active dens have been documented in the CNDDDB in proximity to the project site (see Figure 3a). San Joaquin kit fox have been recorded 0.3 miles and 2.3 miles to the east, on the Tule Elk State Natural Reserve and the Kern Water Bank Authority (CDFW 2015a). The species has also been documented in various locations south of the California Aqueduct, approximately 0.5 miles and 0.8 miles south of the proposed project site (CDFW 2015a). The proposed project site may accommodate foraging San Joaquin kit fox. However, forage would be limited based on a lack of small mammal burrows in the project site that would support a suitable prey base.

## **REPTILES**

**Western Pond Turtle** is a thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. The species seeks cover underwater from basking sites such as open banks, logs, or rocks. Western pond turtles require suitable upland habitat (sandy banks or grassy open fields) for egg-laying.

The proposed project site does not support suitable habitat for the species, as existing canals and ditches in the project site are regularly maintained and lack aquatic vegetation year round. Where

canals and ditches were observed to have water, the adjacent upland habitats were under active agricultural production (i.e., alfalfa, cotton). No individuals were observed or evidence of the species was identified during biological surveys. Western pond turtles have not been recorded within the boundaries of the proposed project site (see Figure 3a). The species has been documented 0.4 miles to the south, along the California Aqueduct, and 0.8 east of the proposed project site, at the Tule Elk State Natural Reserve (CDFW 2015a). Based on a lack of suitable habitat in the project site, the species is not expected to be present or become established in the project site.

**Blunt-Nosed Leopard Lizard** is listed as a federal and State endangered species. The species is also considered Fully Protected by the CDFW. Blunt-nosed leopard lizards inhabit open, sparsely vegetated areas of low relief (particularly annual and perennial grasslands, alkali scrub, and saltbush scrub), and are absent from areas of steep slope, dense vegetation, or seasonal flooding. The current range of the species includes undeveloped parcels in the southern-most portion of the San Joaquin Valley (Tulare and Kings Counties south), San Joaquin Valley floor in the vicinity of western Madera County, and along the western edge of the San Joaquin Valley from Merced County south. Its range also extends into the Carrizo Plain and Cuyama Valley southwest of the San Joaquin Valley.

Estimated densities in occupied habitat have varied from 0.1 to 8.5 lizards per acre (Uptain *et al.* 1985, Williams and Germano 1991, Williams *et al.* 1993, Germano *et al.* 1994). Individuals use small rodent burrows for shelter from predators and temperature extremes. Their burrows are usually abandoned ground squirrel tunnels, or occupied or abandoned kangaroo rat tunnels (Montanucci 1965). Seasonal above-ground activity is correlated with weather conditions (primarily temperature). Optimal activity occurs when air temperatures are between 23.5 °C and 40 °C and ground temperatures are between 22 °C and 36 °C (USFWS 1985). Adults are active above ground in the spring months from March or April through June or July with the level of activity decreasing until approximately late June when most adults go underground and become inactive. At this latter time only sub-adult and hatchling individuals generally continue to be active. By August or September generally all adults have retreated to burrows to begin overwintering. Hatchlings may be active until mid-October or November.

No suitable habitat for blunt-nosed leopard lizard is present in the proposed project site since lands within the project boundaries are under agricultural use. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. No individual blunt-nosed leopard lizards were observed during biological surveys and the species has not been recorded in the project site. Since the proposed project would not modify or alter potential blunt-nosed leopard lizard habitat, protocol level surveys to detect species presence were not completed.

Blunt-nosed leopard lizard has been documented approximately 0.4 miles to the east, on the Tule Elk State Natural Reserve (see Figure 3a). Blunt-nosed leopard lizards have been recorded in locations east of Interstate 5, approximately 2.7 miles and 4.5 miles northeast of the project site

(CDFW 2015a). Observation records in the CNDDDB were made in areas that support Valley Saltbush Scrub or Alkali Sink habitats. Where natural lands persist, the species may potentially occur; however, based on current agricultural land use and site conditions observed during biological surveys, blunt-nosed leopard lizards are not expected to be present or become established in the project site.

**San Joaquin Whipsnake** is a California Species of Special Concern. The species occurs along the Coast Ranges from Alameda and San Joaquin Counties in the north, south to Kern County. They are found in open, dry habitats with little or no tree cover. They require mammal burrows or rocky outcrops for refuge and may use them as oviposition sites (Jennings and Hayes 1994).

No suitable habitat is present in the proposed project site. Potential habitat is present in the buffer area, south and east of the project site, in uncultivated areas that support natural vegetation. These areas occur outside the project boundaries, along the California Aqueduct, the Outlet Canal, the Tule Elk State Natural Reserve, and the Elk Hills Oil Field. No burrows suitable for potential use by this species were observed within the boundaries of the proposed project site. No individual San Joaquin whipsnakes were observed during biological surveys. The species has been documented 9.9 miles east of the proposed project site (CDFW 2015a).

**Giant Garter Snake** is the largest of all garter snakes and perhaps the most aquatic garter snake of California. They are brown below and brown, olive or tan above with checkered spots and three (3) pale or yellow stripes that run down their back and sides. Giant garter snakes generally measure three to five (3-5.5) feet in length. Giant garter snakes are active spring to mid-fall (May 1 through October 1). Breeding occurs from March to May. Females give birth to live young from late July to early September; brood sizes range from 10 to 46 young. During fall, they seek refuge in burrows or other soil crevice above floodwater levels and remain dormant throughout the winter. The diet of a giant garter snake consists mainly of fish, amphibians, and their larvae. They will also consume ground nesting birds and their young.

The species occurs in marsh, swamp, riparian scrub, and wetland habitats. Giant garter snakes prefer freshwater marsh and low gradient streams with mud bottoms, but have adapted to drainage canals and irrigation ditches (CDFW 2015a). The snake requires enough water during its active season to maintain high densities of prey; emergent wetland vegetation (i.e., cattails and bulrushes) for cover and foraging; and adjacent uplands for basking. Higher uplands are used for cover and refuge from floodwaters during its inactive season.

The giant garter snake is listed as a federal and State threatened species. Giant garter snakes are endemic to the Central Valley of California and historically occurred throughout the San Joaquin and Sacramento Valleys (Hansen and Brode 1980). The species has been documented north from Colusa County and south to Buena Vista Lake in Kern County. Its current range is limited to the Sacramento Valley and isolated portions of the San Joaquin Valley (USFWS 1999). Due to loss of natural habitat, the giant garter snake relies heavily upon rice fields in the Sacramento Valley. Only a few sightings have been reported in the San Joaquin Valley, on Federal National Wildlife Refuge Lands and State Wildlife Areas (USFWS 2015c).

The proposed project site is located outside the current known range and distribution of the species (CDFW 2015b). Giant garter snake has been historically documented within the boundaries of the project site (see Figure 3a). The species was identified in that location prior to, but not during, a 1986-87 study of the species' distribution (CDFW 2015a). Giant garter snake was also historically captured in a location approximately 4.6 miles to the southeast (CDFW 2015a). No suitable habitat for giant garter snake was observed within the proposed project site. While canal systems in the area may provide a means of dispersal for giant garter snake, the species has not been documented in proximity to the project site in more recent years. Since canals in the project site that contain water lack vegetation and appear to be regularly maintained, giant garter snake is not expected to occur in the project site based on a lack of suitable habitat.

### **Incidental Wildlife**

A few bird species protected under the Federal Migratory Bird Treaty Act were observed in flight or foraging during field surveys (see Table 2). No active nests or inactive nesting sites were observed during biological surveys. Potential nesting habitat for migratory and other sensitive birds (great-horned owl) was observed in tree stands (palm) within the project site. Potential nesting and foraging habitat is also present in areas that support natural vegetation, and in areas that contain riparian vegetation, along the Outlet Canal to the southeast. Additionally, red-tailed hawks and common raven may construct nests on power poles that occur parallel to existing access roads.

### **SPECIAL-STATUS PLANTS**

From our literature reviews, a list was generated of 13 special-status plants that may potentially occur in or be affected by projects in the East Elk Hills and Tupman quadrangles (an area representing 140 square miles). As illustrated in Figure 3b, three (3) special-status plants have been documented in proximity to the proposed project site (CDFW 2015a). These species include slough thistle, recurved larkspur, and oil neststraw. The life history and habitat requirements of each of these species are briefly described below.

**Horn's Milk-Vetch** is an annual herb that occurs in playas, meadows and seeps. The species is typically found along lake margins, and in alkaline soils. The species blooms from May through October. Horn's milk-vetch was subject to eradication efforts in the early 1900's because it was poisonous to sheep and the species is known from only 14 occurrences (CNPS 2015).

No suitable habitat is present in the proposed project site or buffer area. No individuals or evidence of the species was observed during biological surveys. Horn's milk-vetch has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 4.6 miles to the southeast and 6.3 miles east of the project site (CDFW 2015a).

**Heartscale** is an annual herb that has been historically documented in the northern Temblor Range, usually on bare soils around vernal pools (Twisselmann 1967). This species occurs on saline or alkaline soils in meadows, seeps, and chenopod scrub habitats, and in sandy areas in

valley and foothill grassland. Plants are similar to crownscale, both in appearance and habitat requirements; the species has been recorded in association with the spiny saltbush (*Atriplex spinifera*) community.

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. Heartscale has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 4.5 miles to the south (CDFW 2015a).

**Crownscale** is an annual herb that is known from south of the Tulare Lake, west through the Temblor Range to Soda Lake in San Luis Obispo County (Twisselmann 1967). Preferred habitats include vernal pools and alkaline or clay soils in chenopod scrub, valley and foothill grassland. This species is similar to heartscale, both in appearance and habitat requirements.

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, crownscale has not been documented within the boundaries of the proposed project site (CDFW 2015a).

**Lost Hills Crownscale** is an annual herb that has been documented in Kern, Kings, Fresno, Merced, and San Luis Obispo Counties. Plants from San Luis Obispo may be an unnamed new taxon (CNPS 2015). This species occurs in powdery, alkaline soils that are seasonally moist in chenopod scrub, vernal pools, and valley and foothill grassland habitats. Threats to the species include grazing, agricultural conversion, and energy development.

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. Lost Hills crownscale has not been documented within the boundaries of the proposed project site (see Figure 3b). The species has been recorded approximately 2.0 miles and 3.5 miles southeast of the proposed project site (CDFW 2015a).

**Mexican Mosquito Fern** occurs in marshes, swamps, ponds or slow water. No suitable habitat for this species is present in the proposed project site or buffer area. No individuals or evidence of this species were observed during biological surveys. As illustrated in Figure 3b, Mexican mosquito fern has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).

**Slough Thistle** is an annual or perennial herb that occurs in chenopod scrub, riparian scrub, marshes and swamps. The species may be present in other areas where conditions are favorable. Slough thistle is known from fewer than 20 locations in Kern, Kings, and San Joaquin Counties (CNPS 2015). Threats to this species include agriculture and competition from non-native plants.

The species has been recorded in the buffer area of the proposed project (see Figure 3b). Slough thistle has also been documented along the east bank of the Kern River, approximately 4.6 miles southeast of the project site (CDFW 2015a). Potential habitat is present in the buffer area southeast of the proposed project site, mainly along the Outlet Canal and on the Tule Elk State Natural Reserve. However, no suitable habitat for this species is present within the boundaries of the proposed project site. No individuals or evidence of the species were observed during biological surveys.

**Recurved Larkspur** is a perennial herb that is endemic to California. Historically, recurved larkspur was widely distributed in the Sacramento and San Joaquin valleys, ranging from Glenn and Butte counties south to Kern County. Most of the known occurrences are in Kern, Tulare, and San Luis Obispo Counties. The species now appears to be very rare outside the southern San Joaquin Valley (CDFW 2015a). Much of this species habitat has been converted to agriculture, and the species continues to be threatened by grazing and trampling (CNPS 2015).

Recurved larkspur occurs on sandy or clay alkaline soils, generally in annual grasslands or in association with saltbush scrub or valley sink scrub habitats. The species occurs at elevation ranging from 100 to 2,000 feet above sea level (CDFW 2015a) and blooms from March through June (CNPS 2015). Very little ecological information is available for the species and most of the literature on the species pertains to its taxonomy.

Potential habitat for recurved larkspur is present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas that border the California Aqueduct. However, no suitable habitat for this species is present in the proposed project site. No individuals or evidence of the species were observed during biological surveys. Recurved larkspur has not been documented within the boundaries of the proposed project site (see Figure 3b). However, the species has been recorded approximately 0.6 miles and 1.3 miles southwest of the proposed project site (CDFW 2015a).

**Kern Mallow** is an annual herb that occurs on alkali flats and eroded hills, mainly in the southern San Joaquin Valley (USFWS 2013). This species occurs in chenopod scrub, valley and foothill grassland habitats and is often found growing under spiny and common saltbush (USFWS 1998). Flower color is white to more or less purple (USFWS 2013). Plants have either perfect flowers (i.e., having both pistils and stamens) or pistillate flowers (i.e., without stamens). While other *Eremalche* species have perfect flowers, *E. kernensis* is the only member of this genus that exhibits this condition, known as gynodioecy. Reproduction of the species varies greatly depending on precipitation.

There has been much uncertainty about the taxonomic status and identification of Kern mallow, focused on flower color, gender and range (USFWS 1998). Studies have focused on three related taxa: Kern mallow (*Eremalche kernensis*), Parry's mallow (*E. parryi*), and desert mallow (*E. exilis*). Historically, *E. kernensis* was thought to have a very restricted range, limited to an area between McKittrick and Buttonwillow. At the time of listing, the white flowered *E. kernensis* was known from only six (6) locations in this area, locally known as Lokern (USFWS 2013). The *Recovery Plan* for the species recognized pink-flowered plants in Buena Vista Valley, Elk Hills, Lost Hills, McKittrick Hills, Stockdale, the Temblor Range, Corcoran,

Cuyama Valley, and Pixley (USFWS 1998). In 2002, it was determined that many records of *E. kernensis* were likely misidentified and were *E. exilis* (Andreasen et al. 2002). Confusion over the taxonomic status of Kern mallow has not been resolved by genetic studies completed to date. Populations of Kern mallow have been documented in Kern, San Luis Obispo, Santa Barbara, Tulare, and Ventura Counties (CNPS 2015). The species is known from 212 records, 209 of which are presumed extant. However, many of the locations where Kern mallow has been historically recorded have not been revisited to determine if the species is present (USFWS 2013).

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. Kern mallow has not been recorded within the boundaries of the proposed project site (see Figure 3b). The species has been documented in locations approximately 1.9 miles to the west and 4.8 miles southeast of the biological survey area (CDFW 2015a).

**Hoover's Eriastrum** is an annual herb that occurs in chenopod scrub, valley and foothill grassland, and pinyon juniper woodland habitats. The species was previously listed as threatened by the USFWS; however, Hoover's eriastrum was delisted in 2003.

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. The species has not been recorded within the boundaries of the proposed project site (see Figure 3b). The species has been documented in numerous locations south and southeast of the biological survey area (CDFW 2015a).

**Cottony Buckwheat** is an annual herb that occurs on clay soils in chenopod scrub and valley and foothill grassland habitats. The blooming period of the species is March through September. Cottony buckwheat has been documented in Kern, Kings, Fresno, and San Luis Obispo Counties (CNPS 2015).

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, this species has not been documented within the boundaries of or in proximity to the proposed project site (CDFW 2015a).

**Tejon Poppy** is an annual herb that occurs in chenopod scrub and valley and foothill grassland habitats. The species is historically known from only six (6) occurrences; however, within the last two decades the species has been recorded in over 50 additional locations. All documented occurrences of Tejon poppy have been in Kern County, in the southern portion of the San Joaquin Valley (CNPS 2015).

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas.



No individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, Tejon poppy has not been documented within the boundaries of the proposed project site. The species has been recorded approximately 2.2 miles southwest and 2.9 miles southeast south of the proposed project site (CDFW 2015a).

**Oil Neststraw** is an annual herb that occurs in chenopod scrub, coastal scrub, and valley and foothill grassland habitats. The blooming period of the species is during March and April. The species has been recorded only in Kern and San Diego Counties (CNPS 2015).

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, oil neststraw has not been documented within the boundaries of the proposed project site. The species has been recorded at several locations to the south, within 1 to 2 miles of the proposed project site (CDFW 2015a).

**San Joaquin Bluecurls** is an annual herb that occurs in chenopod scrub, and valley and foothill grassland habitats. The blooming period of the species is between July and October.

No suitable habitat is present in the proposed project site. However, potential habitat may be present in the buffer area south of the proposed project site, in undisturbed/uncultivated areas. No individuals or evidence of the species were observed during biological surveys. As illustrated in Figure 3b, San Joaquin bluecurls have not been documented within the boundaries of the proposed project site (CDFW 2015a).

As illustrated in Figures 3a and 3b, 13 special-status wildlife species and three (3) special-status plants have been documented in the CNDDDB in vicinity to the proposed project site (CDFW 2015a). Special-status wildlife species that have been recorded in proximity to the proposed project site include San Joaquin kit fox, Western burrowing owl, San Joaquin antelope squirrel, giant kangaroo rat, Tipton kangaroo rat, short-nosed kangaroo rat, San Joaquin pocket mouse, blunt-nosed leopard lizard, giant garter snake, Swainson's hawk, mountain plover, Le Conte's thrasher, and Western pond turtle. Special-status plants that have been documented in vicinity to the project site include slough thistle, recurved larkspur, and oil neststraw.

A total of seven (7) special-status species are known to occur, indicating they were either identified while conducting biological surveys for the proposed project, or they have been (historically) documented in the project site or buffer area in the CNDDDB. Species in this category include giant garter snake, San Joaquin kit fox, Tipton kangaroo rat, Le Conte's thrasher, loggerhead shrike, and slough thistle. Loggerhead shrike is the only special-status species indicated in the records search that was directly observed during biological surveys; the remaining species were recorded in the CNDDDB (CDFW 2015a).

## **ANALYSIS OF POTENTIAL IMPACTS**

The habitat assessment conducted for the proposed BVWSD Palms Project found that no natural lands are present within the boundaries of the proposed project site. However, natural lands and

native habitats are present in the buffer area, in undisturbed/uncultivated areas south and east of the proposed project boundary. Areas of habitat adjacent to the project site occur along the California Aqueduct to the south and on the Tule Elk Reserve to the east. Other natural lands in proximity include the Elk Hills Oil Field, the Coles Levee Ecosystem Preserve, and the Kern Water Bank. Riparian habitat is present southeast of the project site, along the Outlet Canal. The proposed project would avoid directly impacting adjacent areas of saltbush scrub and annual grassland habitat, as they occur outside the boundaries of the proposed project site. Since the proposed project would be conducted in lands disturbed by agricultural use, project implementation would not result in impacts to natural lands.

The project would not interfere with movements of wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the proposed project site or buffer area.

No riparian, wetland, vernal pool, streams, or other sensitive community types were observed within the boundaries of the proposed project site during biological surveys. The proposed project would avoid riparian areas, designated wetlands, and potential wetland areas, as they occur outside the boundaries of the proposed project site. Based on a lack of suitable aquatic habitat in the project site, species including California red-legged frog, vernal pool fairy shrimp, Western pond turtle, delta smelt, least bittern, and marbled godwit are not expected to be present or exposed to the proposed project. Therefore, no specific measures are recommended for these species.

The proposed project is located outside the known range and current distribution of special-status species including California red-legged frog, giant garter snake, Delta smelt, California spotted owl, Lewis's woodpecker, Nuttall's woodpecker, and least bittern. Furthermore, based on a lack of suitable habitat with required elements, these species and others including vernal pool fairy shrimp, cactus wren, and bald eagle are not expected to be present or become established in the proposed project site or buffer area. Therefore, no specific measures are recommended for these species.

No suitable habitat for special-status plants is present within the boundaries of the proposed project site. No special-status plants were observed in the proposed project site during biological surveys. Based on the habitat requirements of targeted plant species and current land use, special-status plant species are not expected to be present or become established in the project site. This determination is based on historic land conversion from habitat to agricultural use, the level of current disturbance, and site conditions observed at the time of our biological surveys.

Slough thistle, recurved larkspur, and oil neststraw have been (historically) recorded in vicinity to the proposed project site; however, special-status plants are not expected to occur in the proposed project site based on historic land conversion and current land use that was observed during biological resource surveys. By confining project activities to previously disturbed areas that do not represent habitat, there is no potential for impact to special-status plants. General avoidance measures to protect wildlife allow for protection of plants as well. Therefore, no specific measures for special-status plant species are included.

Direct mortality or injury to common wildlife populations could occur during ground disturbance activities associated with implementation of the project. Small vertebrate and invertebrate species are particularly prone to impact during project implementation because they are much less mobile, and cannot easily move out of the path of project activities. Other more mobile wildlife species, such as most birds and larger mammals, can avoid project-related activities by moving to other adjacent areas temporarily. Increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. However, common wildlife species have likely become acclimated to on-going agricultural activities and oil and gas exploration, development, and production activities. Because common wildlife species observed during biological surveys are locally and regionally common, potential impacts to these resources are considered less than significant. Therefore, no avoidance or minimization measures are proposed at this time.

Although the project site is located in agriculture, RAB Consulting determined that several special-status wildlife species may potentially be present during project activities, or have low potential to occur in the proposed project site. Certain migratory bird species, such as long-billed curlew and mountain plover, may forage in agricultural areas that contain low-growing vegetation and a potential insect prey base. As a result of mobility, there is potential for certain species to occasionally pass through and/or to forage in the project site. Since natural land that represents potential habitat for several San Joaquin Valley upland species are present in areas adjacent to the project site, avoidance measures to protect special-status wildlife species including, but not limited to, San Joaquin kit fox, American badger, Western burrowing owl, special-status small mammal species, and blunt-nosed leopard lizard during construction and pipeline installation are described below.

Implementation of the proposed project could potentially impact individual special-status small mammal species, including giant kangaroo rat, Tipton kangaroo rat, San Joaquin antelope squirrel, San Joaquin pocket mouse, and Tulare grasshopper mouse, should they be present in the proposed project site during project implementation. Should small mammal burrows become established in the project site prior to construction, the project could impact burrows that may be potentially used by these species. Impacts to special-status small mammal species or their burrows could occur through crushing by construction equipment or entombment below ground in burrows during project activities. These species' normal behavior could also be affected due to noise and vibration from project activities. Impacts to these species would be considered significant. In the event that special-status small mammal species are present or potential small mammal burrows become established in the proposed project site, measures to protect this species from potential impacts are included and described further in the ***Proposed Avoidance and Mitigation Measures*** section.

Implementation of the proposed project could potentially impact individual blunt-nosed leopard lizards, should they be present in the proposed project site during project implementation. Should California ground squirrel burrows, or other small mammal burrows become established in the project site prior to construction, the project could impact burrows that may be potentially used by blunt-nosed leopard lizards. Impacts to blunt-nosed leopard lizards or their burrows could occur through crushing by construction equipment or entombment below ground in burrows during project activities. This species' normal behavior could also be affected due to noise and vibration from project activities. Impacts to this species would be considered

significant. In the event that blunt-nosed leopard lizards are present in the proposed project site, measures to protect this species from potential impacts and avoid take are included and described further in the ***Proposed Avoidance and Mitigation Measures*** section.

Implementation of the proposed project could potentially impact individual San Joaquin kit fox, American badgers, or their dens, should they become established within the proposed project site prior to project implementation. Impacts to badgers or kit fox could occur through crushing by construction equipment during project activities. These species could also be affected due to noise and vibration from project activities if dens are located closer than 200 feet to the proposed project site; project related noise and vibration could cause the abandonment of occupied dens. Impacts to these species would be considered significant. Avoidance and minimization measures to protect this species from potential impacts are included and described further in the ***Proposed Avoidance and Minimization Measures*** section.

Implementation of the proposed project could potentially impact individual and nesting burrowing owls should they become established within the proposed project site prior to or during project implementation. Impacts to this species could occur through crushing by construction and drilling equipment during implementation of project activities. Actively nesting burrowing owls could also be affected due to noise and vibration from project activities if nests are located near the proposed project; project related noise and vibration could cause the abandonment of active nest sites. Impacts to this species would be considered significant. Pre-construction surveys are recommended to detect species presence and/or use in the project sites. In the event that burrowing owls become established in the proposed project site, measures to protect this species from potential impacts are described further in the ***Proposed Avoidance and Minimization Measures*** section.

Implementation of the proposed project could potentially impact individual and nesting migratory bird species, should they become established within the proposed project site prior to project implementation. Impacts to migratory bird species could occur through crushing by construction equipment during project activities. Actively nesting birds could also be affected due to noise and vibration from project activities, if nests are located closer than 250 feet to the proposed project site. Project related noise and vibration could cause the abandonment of active nest sites. Impacts to these species would be considered significant. In the event that nesting birds become established in the proposed project site, avoidance and minimization measures to protect these species from potential impacts are described further in the ***Proposed Avoidance and Minimization Measures*** section.

Implementation of the proposed project could potentially impact individual and nesting Swainson's hawks, should they become established near the proposed project site prior to project implementation. Impacts to the species could occur through crushing by construction equipment and vehicles during project activities. Actively nesting birds could also be affected due to noise and vibration from project activities, if nests are located within 0.5 miles of the proposed project site. Project related noise and vibration could cause the abandonment of active nest sites or forced (early) fledging. Impacts to this species would be considered significant. In the event that Swainson's hawks become established in or near the proposed project site, avoidance and minimization measures to protect the species from potential impacts are described further in the

*Proposed Avoidance and Minimization Measures* section.

Direct mortality or injury to sensitive animal populations could occur from earth-moving activities, if sensitive animal populations become established prior to or during project implementation. Sensitive animals could also become trapped or buried in an open trench. Avoidance and minimization measures to protect sensitive animal species from potential impacts are described further in the *Proposed Avoidance and Minimization Measures* section. For example, biological pre-construction surveys are recommended prior to earth disturbing activities associated with berm construction and pipeline installation (i.e., digging, trenching, and backfilling).

## **PROPOSED AVOIDANCE AND MINIMIZATION MEASURES**

The following avoidance and minimization measures are recommended to avoid or reduce potential impacts to special-status species during the proposed BVWSD Palms Project:

1. An Environmental Awareness Program will be presented to all personnel working in the field on the proposed project site. The program will consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection explain endangered species concerns. The program will include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under the Endangered Species Act(s), and measures being incorporated for the protection of these species and their habitats will also be addressed.
2. As close to the beginning of project activities as possible, but not more than 14 days prior, a qualified biologist will conduct a final pre-construction biological survey of proposed construction areas to verify that no special-status species have become established in the project site.
3. Project site boundaries will be clearly delineated by stakes and/or flagging. Project activities are restricted to the project site to minimize inadvertent degradation or loss of adjacent habitat or agricultural lands during project operations.
4. All areas of habitat and small mammal burrows that may serve as potential for special-status species will be avoided during project activities.
5. To prevent entry of special-status small mammals and other wildlife into construction areas, an exclusion barrier (i.e., silt fencing) should be installed along the southern edge of the project boundary.
6. A biological monitor is recommended when project activities are being conducted in areas adjacent to potential habitat for special-status species (on the south end of the project site). The biologist will be available to direct exclusion barrier installation, and on an on-call basis thereafter for the duration of the project, to direct project activities and ensure that take of listed and other special-status species is avoided.

7. Off-road traffic outside of the designated project site should be prohibited.
8. Project-related traffic will observe a 20 mph speed limit in the project site, except on County roads and State and federal highways, to avoid impacts to special-status and common wildlife species.
9. When possible, project activities will be scheduled to avoid evening hours to minimize potential impacts to special-status wildlife species that are active during the night.
10. Hazardous materials, fuels, lubricants, and solvents that spill accidentally during project-related activities will be cleaned up and removed from the project sites as soon as possible according to applicable federal, State and local regulations.
11. To prevent entrapment of animals during construction, all excavated steep-walled holes or trenches in excess of two (2) feet in depth should be covered at the close of each working day by plywood or similar material. For trenches that cannot be closed daily, one or more escape ramps constructed of earth fill or wooden planks should be installed. Ramps should be located at no greater than 1,000-foot intervals (for pipelines) and at no less than 45-degree angles.
12. Before such holes or trenches are filled they should be thoroughly inspected for trapped animals. Any animals discovered will be allowed to escape voluntarily, or will be removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.
13. All pipes, culverts, or similar structures stored at the proposed project sites overnight having a diameter of four (4) inches or greater will be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight will be capped. If during project implementation a wildlife species is discovered inside a pipe, that section of pipe will not be moved or, if necessary, moved only once to remove it from the path of project activity, until the wildlife species has escaped.
14. All food-related trash items such as wrappers, cans, bottles or food scraps generated during project activities will be disposed of only in closed containers and regularly removed from the proposed project sites. Food items may attract wildlife species onto the proposed project sites, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife will be allowed.
15. To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets will be permitted on the project sites.
16. The following measures (a-e) will be implemented by BVWSD to ensure protection and no take of blunt-nosed leopard lizards during project implementation:
  - a. A final clearance survey will be conducted to ensure that no blunt-nosed leopard lizards are present in the project site.

- b. If no individual blunt-nosed leopard lizards are observed and no burrows are identified within the project sites and a 50-foot avoidance buffer during the final clearance survey, then project activities may proceed.
  - c. Alternatively, if suitable burrows that may serve as potential refugia for blunt-nosed leopard lizard are identified that cannot be avoided, and a minimum 50-foot avoidance buffer cannot be maintained, then additional surveys to detect the species will be completed in accordance with CDFW's *Approved Survey Methodology For The Blunt-Nosed Leopard Lizard* (CDFG 2004).
  - d. If a blunt-nosed leopard lizard is observed during project pre-construction or clearance surveys, the USFWS and CDFW will be notified for further guidance.
  - e. All vehicle operators will check under vehicles and equipment prior to operation, or if left idle.
17. BVWSD will implement the following measures (17-19) to protect San Joaquin kit fox. These measures have been adapted from the USFWS *Standardized Recommendations For Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011):
- a) Pre-construction surveys should be conducted by a qualified biologist no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities.
  - b) Construction and other project related activities should avoid den(s) that could be used by San Joaquin kit fox.
  - c) If a natal/pupping den is discovered within the project site or within 200 feet of the project boundaries, the USFWS and CDFW should be notified. Natal/pupping dens may not be destroyed while occupied, and a take authorization/permit is required to destroy these dens even after they are vacated.
  - d) If dens are identified during pre-construction surveys that may be used by San Joaquin kit fox, protective exclusion zones will be established prior to project activities.
  - e) To ensure protection of known dens, exclusion zones should be established 100 feet from the den entrance(s) with fencing that does not prevent access to the den by kit foxes. Acceptable fencing includes untreated wood particle-board, silt fencing, or orange construction fencing, as long as it has opening for kit fox ingress/egress and keeps humans and equipment out.
  - f) For potential and/or atypical dens, placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.



- g) Exclusion zones around kit fox dens will be maintained until all construction related disturbances have been completed. At that time all fencing will be removed to avoid attracting subsequent attention to the dens.
  - h) Only essential vehicle operation on existing roads and foot traffic should be permitted in exclusion zones. Otherwise, all construction, vehicle operation, material storage, or any type of surface-disturbing activity should be prohibited or greatly restricted within the exclusion zones.
18. If den avoidance is not feasible or if buffer zones cannot be maintained, known dens and potential dens should be monitored prior to construction activities.
- a. Known dens and potential dens occurring within the footprint of the project must be monitored for three (3) consecutive days with tracking medium or an infra-red camera beam to determine the current use. If no kit fox activity is observed during this period, the den(s) should be destroyed immediately to preclude subsequent use.
  - b. If kit fox activity is observed at the den(s) during this period, the den(s) should be monitored for at least five (5) consecutive nights from the time of the observation to allow any resident animal to move to another den during its normal activity. Only when the den(s) are determined unoccupied may the den(s) be excavated.
  - c. Destruction of the den(s) should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den(s) should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter to use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity will cease immediately and monitoring the den as described above should resume. Destruction of the den may be completed when, in the judgment of the biologist, the animal has escaped without further disturbance, from the partially destroyed den.
  - d. If any kit fox den is considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities will cease and the USFWS and CDFW will be notified immediately.
19. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW.
20. BVWSD should designate a project representative as the contact for any employee or contractor who finds a dead, injured, or entrapped special-status wildlife species.
21. If ground disturbing activities are planned to occur during the breeding season of migratory bird or raptor species (February through mid-September), surveys for active nests will be conducted by a qualified biologist no more than 14 days prior to the start of

project activities. Pre-construction surveys will be conducted for nesting migratory birds and raptor species in the project sites and areas that support potential nesting habitat.

- a. If no active nest(s) are found, then project activities may proceed and no further mitigation measures will be required.
- b. If active nest(s) are found, then exclusion zones will be established a minimum of 250-feet around a nest. Project activities will avoid disturbance within the exclusion zone during the nesting season.

22. To meet the minimum level of protection for Swainson’s hawk, surveys to identify birds and active nest sites should be completed by a qualified biologist for a ½ mile radius around all project activities. Surveys should be completed in accordance with the *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (Swainson’s Hawk Technical Advisory Committee 2000).

- a. If project activities are scheduled to occur outside the breeding or nesting season (August through December), then no additional surveys for Swainson’s hawk are required.
- b. If ground disturbing activities are planned to occur during the breeding or nesting season of Swainson’s hawk (late March through late July) additional surveys to detect adults birds and nest(s) are recommended. The survey periods, times, and number of survey days are as follows:

Survey Dates	Search Image	Survey Time	Number of Surveys
January – March 20	Potential Nest Locations	All day	1 (optional)
March 21 – April 5	Arrival	Sunrise to 1000 1600 to Sunset	3
April 6-April 20	Breeding	Sunrise to 1200 1630 to Sunset	3
April 21-June 10	Nesting (egg-laying & incubation)	Monitor known nest sites only	Initiating surveys is not recommended
June 11 – July 30	Nest sites (post-fledging)	Sunrise to 1200 1600 to Sunset	3

- c. If surveys locate a nest site within 0.5 mile, a Swainson’s hawk Monitoring and Mitigation Plan will be prepared by a qualified biologist in consultation with the CDFW.
- d. During the breeding and nesting season (late March through late July), ensure no disturbance or other project related activities that may cause nest abandonment or forced fledging to occur within 0.5 miles of an active Swainson’s hawk nest. Buffer zones may be adjusted in consultation with the CDFW.

23. The following measures included in the CDFW’s *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) will be implemented by BVWSD for the proposed project:

- a. Pre-construction (take avoidance) surveys will be completed by a qualified biologist no less than 14 days prior to ground disturbing activities to detect the presence of burrowing owls in the project site.
- b. If no burrowing owls are detected during pre-construction (take avoidance) surveys, then project activities may proceed.
- c. If burrowing owl presence is detected during pre-construction surveys the owls will be monitored to determine use in the project site.
- d. Avoid impacting burrows occupied during the non-breeding season (by migratory or non-migratory resident burrowing owls).
- e. Avoid disturbing occupied burrows during the burrowing owl nesting season (February 1 through August 31).
- f. Recommended setback distances and restricted activity dates for burrowing owl nesting sites based on the level of disturbance are as follows:

Time of Year	Level of Disturbance		
	Low	Medium	High
April 1 – Aug 15	200 meters	500 meters	500 meters
Aug 16 – Oct 15	200 meters	200 meters	500 meters
Oct 16 – Mar 31	50 meters	100 meters	500 meters

**CONCLUSION**

Sixteen special-status species (13 special-status wildlife species and three (3) special-status plants) have been documented in the CNDDDB in vicinity to the proposed project site (CDFW 2015a). Special-status wildlife species that have been recorded in proximity to the proposed project site include San Joaquin kit fox, Western burrowing owl, San Joaquin antelope squirrel, giant kangaroo rat, Tipton kangaroo rat, short-nosed kangaroo rat, San Joaquin pocket mouse, blunt-nosed leopard lizard, giant garter snake, Swainson’s hawk, mountain plover, Le Conte’s thrasher, and Western pond turtle. Special-status plants that have been documented in vicinity to the project site include slough thistle, recurved larkspur, and oil neststraw.

A total of seven (7) of those special-status species are known to occur, indicating they were either identified while conducting biological surveys for the proposed project, or they have been (historically) documented in the project site or buffer area in the CNDDDB. Species in this category include giant garter snake, San Joaquin kit fox, Tipton kangaroo rat, Le Conte’s thrasher, loggerhead shrike, and slough thistle. Loggerhead shrike is the only special-status

species indicated in the records search that was directly observed during biological surveys; the remaining species were recorded in the CNDDDB (CDFW 2015a).

The habitat assessment conducted for the proposed BVWSD Palms Project found that no natural lands are present within the boundaries of the proposed project site. However, natural lands and native habitats are present in the buffer area, in undisturbed/uncultivated areas south and east of the proposed project boundary. Areas of habitat adjacent to the project site occur along the California Aqueduct to the south and on the Tule Elk Reserve to the east. Other natural lands in proximity include the Elk Hills Oil Field, the Coles Levee Ecosystem Preserve, and the Kern Water Bank. Riparian habitat is present southeast of the project site, along the Outlet Canal. The proposed project would avoid directly impacting adjacent areas of saltbush scrub and annual grassland habitat, as they occur outside the boundaries of the proposed project site. As proposed, the BVWSD Palms Project has been sited to avoid impacts to natural lands, including sensitive plant communities, riparian areas, designated wetlands, and potential wetlands.

Since the proposed project would be conducted entirely on lands disturbed by agricultural use, project implementation would not result in impacts to natural lands. Based on historic conversion to agricultural use, current land use, and conditions observed during biological surveys, RAB Consulting has determined the proposed project site does not support habitat that is suitable for use by many special-status species with potential to occur.

No suitable habitat for special-status plants is present within the boundaries of the proposed project site. No special-status plants were observed in the proposed project site during biological surveys. Based on the habitat requirements of targeted plant species and current land use, special-status plant species are not expected to be present or become established in the project site. This determination is based on historic land conversion from habitat to agricultural use, the level of current disturbance, and site conditions observed at the time of our biological surveys.

Although the project site is located in agricultural lands, RAB Consulting determined that several special-status wildlife species may potentially be present during project activities, or have low potential to occur in the proposed project site. Certain migratory bird species, such as long-billed curlew and mountain plover, may forage in agricultural areas that contain low-growing vegetation and a potential insect prey base. As a result of mobility, there is potential for certain species to occasionally pass through and/or to forage in the project site. Since natural land that represents potential habitat for several San Joaquin Valley upland species is present in areas adjacent to the project site, avoidance measures are recommended to protect special-status wildlife species including, but not limited to, San Joaquin kit fox, American badger, Western burrowing owl, giant kangaroo rat, Tipton kangaroo rat, short-nosed kangaroo rat, San Joaquin pocket mouse, Tulare grasshopper mouse, and blunt-nosed leopard lizard during project activities.

If the avoidance and minimization measures recommended in this report are implemented by the BVWSD for the proposed Palms project, impacts to listed and other special-status wildlife and special-status plant species would be avoided.

## **LITERATURE CITED AND REFERENCES CONSULTED**

- Abrams, L. 1923. Illustrated flora of the Pacific states. Volume I. Stanford University Press, Stanford, California. 538 pp.
- Abrams, L. 1944. Illustrated flora of the Pacific states. Volume II. Stanford University Press, Stanford, California. 635 pp.
- Abrams, L. 1951. Illustrated flora of the Pacific states. Volume III. Stanford University Press, Stanford, California. 866 pp.
- Abrams, L. and R. S. Ferris. 1960. Illustrated flora of the Pacific states. Volume IV. Stanford University Press, Stanford, California. 732 pp.
- Braun, S. E. 1985. Home range and activity patterns of the giant kangaroo rat, *Dipodomys ingens*. *Journal of Mammalogy*. 66(1):1-12.
- Burt, W. B. and R. P. Grossenheider. 1976. A field guide to the mammals. Houghton Mifflin Company. Boston, Massachusetts. 289 pp.
- Bushnel, R. G. 1978. Effect of noise on wildlife. Introduction. Pages 7-22. *In*: Fletcher, J. L. and R. G. Busnel (eds.). *Effects of noise on wildlife*. Academic Press, New York. 305 pp.
- CDFG (California Department of Fish and Game). 1984. Guidelines for assessing effects of proposed developments on rare and endangered plants and plant communities. The Resource Survey, California Department of Fish and Game.
- CDFG (California Department of Fish and Game). 1989. Designated Endangered or Rare Plants. State of California, Resources Agency.
- CDFG (California Department of Fish and Game). 1990. Region 4 Survey methodologies for San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, Tipton kangaroo rat, giant kangaroo rat. Compiled by R. Rempel and G. Presley.
- CDFG (California Department of Fish and Game). 1995. Staff report on burrowing owl mitigation. Unpublished protocol, California Department of Fish and Game, Sacramento, California. 8 pp.
- CDFG (California Department of Fish and Game). 2000. Guidelines for assessing effects of proposed developments on rare and endangered plants and natural communities. The Resource Survey, California Department of Fish and Game.
- CDFG (California Department of Fish and Game). 2004. Approved survey methodology for the blunt-nosed leopard lizard. Unpublished protocol, California Department of Fish and Game, Sacramento, California. 4 pp.

- CDFG (California Department of Fish and Game). 2004. Natural Diversity Database Special Animals. Unpublished list.
- CDFG (California Department of Fish and Game). 2009. Protocols for Surveying and evaluating impacts to special-status native plant populations and natural communities. California Department of Fish and Game, November 2009.
- CDFG (California Department of Fish and Game). 2012. Staff Report on Burrowing Owl Mitigation. State of California, Natural Resources Agency, Department of Fish and Game. March 7, 2012. 34 pp.
- CDFW (California Department of Fish and Wildlife). 2015. California Natural Diversity Database. Rare Find 5, for Commercial Subscribers. Habitat Planning and Conservation Branch. Electronic Database.
- CDFW (California Department of Fish and Wildlife). 2015b. California Wildlife Habitat Relationships Systems. California Department of Fish and Wildlife. California Interagency Wildlife Task Group. <https://nrm.dfg.ca.gov/>. Website accessed on July 3, 2015.
- CDFW (California Department of Fish and Wildlife). 2015c. Survey and Monitoring Protocols and Guidelines. [https://www.dfg.ca.gov/wildlife/nongame/survey\\_monitor.html](https://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html).
- CNPS (California Native Plant Society). 1991. Mitigation guidelines regarding impacts to rare, threatened, and endangered plants. Unpublished manuscript by California Native Plant Society – Rare plant scientific advisory committee. 17 pp.
- CNPS (California Native Plant Society). 2001. Botanical survey guidelines of the California Native Plant Society. Fremontia. 29:3-4.
- CNPS. California Native Plant Society). 2012. Vegetation Alliances of the Great Valley Ecoregion, California.
- CNPS (California Native Plant Society) Rare Plant Program. 2015. Inventory of Rare, and Endangered Plants of California, (online edition, v8-02). California Native Plant Society. Sacramento, California. Website <http://www.rareplants.cnps.org> [accessed September 10, 2015).
- Cheatham, N. H. and J. R. Haller. 1975. An annotated list of California habitat types. Unpublished manuscript prepared for University of California Natural Land and Water Reserves System. 80 pp.
- Cypher, B.L., G.D. Warrick, M.R.M. Otten, T.P. O'Farrell, W.H. Berry, C.E. Harris, T.T.Kato, P.M. McCue, J.H. Scrivner and B.W. Zoellick. 2000. Population dynamics of San

- Joaquin kit foxes at the Naval Petroleum Reserves in California. Wildlife Society Monograph Number 145. 43 pp.
- Cypher, E. A. 1994. Demography of *Caulanthus californicus*, *Lembertia congdonii*, and *Eriastrum hooveri*, and vegetation characteristics of endangered species populations in the southern San Joaquin Valley and the Carrizo Plain Natural Area in 1993. California Dept. Fish and Game, Sacramento, Unpubl. Rep., 50 pp. + photographs.
- Germano, D.J. and D.F. Williams. 1994. *Gambelia sila* (blunt-nosed leopard lizard). Cannibalism. Herpetological Review. 25:26-27.
- Germano, D.J., R.B. Rathbun and L.R. Saslaw. 2001. Managing exotic grasses and conserving declining species. Wildlife Society Bulletin. 29:551-559.
- Germano, D.J., P.T. Smith and S.P. Tabor. 2007. Food habitats of the blunt-nosed leopard lizard (*Gambelia sila*). Southwestern Naturalist. 52(2): 319-324.
- Grinnell, J. 1932. Habitat relations of the giant kangaroo rat. Journal of Mammalogy. 13(4):305-320.
- Grinnell, J. and A. H. Miller. 1944. The Distribution of the Birds of California. Cooper Ornithological Club, Berkeley, California. 615 pp.
- Hawbecker, A. C. 1944. The giant kangaroo rat and sheep forage. Journal of Wildlife Management. 8:161-165.
- Hawbecker, A. C. 1947. Food and moisture requirements of the Nelson antelope ground squirrel. Journal of Mammalogy. 28:115-125.
- Hawbecker, A. C. 1953. Environment of the Nelson antelope ground squirrel. Journal of Mammalogy. 34 (3): 324-334.
- Hickman, J. 1996. The Jepson Manual: Higher plants of California. University of California Press. Berkeley, California.
- Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished manuscript, California Department of Fish and Game, Nongame - Heritage Program, Sacramento. 156 pp.
- Ingles, L. G. 1965. Mammals of the Pacific states, California, Oregon, Washington. Stanford University Press, Stanford, California. 506 pp.
- Jameson, E. W. Jr. and H. J. Peeters. 1988. California Mammals. University of California Press. Berkeley, CA. 403 pp.



- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA. Contract Number 8023. 260 pp.
- Laughrin, L. 1970. San Joaquin kit fox, its distribution and abundance. Wildlife Management Branch Administrative Report Number 70-2. State of California Resources Agency, Department of Fish and Game. Sacramento, California. 19 pp.
- Lee, J. M. and D. B. Griffith. 1977. Transmission audible noise and wildlife. *In: Proceedings Symposium Ninth International. Congress on Acoustics. July 4-9, 1977. Madrid, Spain.*
- Long, C. A. 1973. *Taxidea taxus*. Mammal Species, 26:1-4.
- Martin, D. J. 1973. Selected aspects of burrowing owl ecology and behavior. The Condor. 75:446-456.
- Moe, L.M. 1994. A synonymized list of vascular plant species in Kern County, California. Crossosoma. 20(1):17-44.
- Moe, L.M. 1995. A key to vascular plant species of Kern County California. California Native Plant Society. 225 pp.
- Montanucci. R.R. 1965. Observations on the San Joaquin leopard lizard, *Crotaphytus wislizenii silus* Stejneger. Herpetologica. 21:270-283.
- Montanucci. R.R. 1967. Further studies on leopard lizards, *Crotaphytus wislizenii*. Herpetologica. 23:119-125.
- Morrell, S. 1972. Life History of the San Joaquin Kit Fox. California Department of Fish and Game. 58(3): 162-174.
- Munz, P. A. and D. D. Keck. 1968. A California flora and supplement. University of California Press, Berkeley.
- Murie, O. J. 1974. A Field Guide to Animal Tracks. Houghton Mifflin Company. Boston, MA.
- Nelson, J. R. 1987. Rare plant surveys: Techniques for impact assessment. pp. 159-166. *In: T. Elias (ed.), Conservation and Management of Rare and Endangered Plants. California Native Plant Society, Sacramento, California.*
- O'Farrell, T. P. 1983. San Joaquin kit fox recovery plan. U. S. Fish and Wildlife Service, Sacramento, California. 84 pp.
- Orloff, S.G. 1992. Survey techniques for the San Joaquin kit fox (*Vulpes macrotis mutica*). pp 185-197. *In: Williams, D.F., S. Byrne and T. A. Rado (eds.), Proceedings of a conference on endangered and sensitive species of the San Joaquin Valley, California, Bakersfield,*

- California, December 10-11, 1987. California Energy Commission, Sacramento, California. 388 pp.
- Orloff, S. F. Hall, and L. Spiegel. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of its range. California-Nevada Wildlife Society Proceedings.
- Palmero, L. 1983. Foraging and social behavior of Cuyama Valley leopard lizards. Unpublished masters of science thesis, University of California, Davis, California.
- Preston, W. L. 1981. Vanishing Landscapes: Land and line in the Tulare Basin. University of California Press, Berkeley, California.
- Randall, J. A. 1997. Social organization and communication in *Dipodomys ingens*. Report for Research during 1995-96, Permit PR-799486, on the endangered giant kangaroo rat, *Dipodomys ingens*, to U.S. Fish and Wildlife Service.
- Remsen, J. V. Jr. 1978. Bird species of special concern in California, an annotated list of declining or vulnerable bird species. California Department of Fish and Game, Nongame Wildlife Investigations, Wildlife Management Branch Administrative Report Number 78-1. 52 pp.
- Sankary, M.N. and M.G. Barbour. 1972. Autecology of *Atriplex polycarpa* from California. Ecology. 53:155-1162.
- Sawyer, J. and T. Keeler-Wolf. 1995. A manual of California Vegetation. California Native Plant Society. Sacramento, California
- Shaw, W. T. 1934. The ability of the giant kangaroo rat as a harvester and storer of seeds. Journal of Mammalogy. 15(4):275-286.
- Skinner, M.W., and B.M.Pavlik. 1994. Inventory of rare and endangered vascular plants of California. California Native Plant Society Special Publication Number 1 (5th edition). California Native Plant Society, Sacramento, California. 336 pp.
- Smith, J. P. and K. Berg. 1988. Inventory of rare and endangered plants of California. California Native Plant Society Special Publication Number 4, Sacramento, California.
- Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Third Edition. Houghton Mifflin Company. Boston, Massachusetts. 514 pp.
- Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology For Swainson's Hawk Nesting Surveys In California's Central Valley. May 31, 2000. 5 pp.
- Taylor, D. W. 1987. Status of San Joaquin Woolly-threads (*Lembertia congdonii*). U. S. Fish and Wildlife Service, Sacramento.

- Taylor, D. W. and W. B. Davilla. 1986. Status survey of three plants endemic to the San Joaquin Valley, California. U.S. Fish and Wildlife Service, Sacramento, California.
- Tollestrup, K. 1976. A standardized method of obtaining an index of densities of blunt-nosed leopard lizards, *Crotaphytus silus*. U.S. Fish and Wildlife Service. Unpublished Masters Thesis.
- Twisselmann, E. C. 1956. A flora of the Temblor Range, Kern County, California. Wasmann Journal of Biology. 14:161-300.
- Twisselmann, E. C. 1967. A flora of Kern County, California. Wasmann Journal of Biology. 25:1-395.
- Uptain, C., W.A. Clark, and S.M. Juarez. 1985. Mark-recapture population estimates and visitation indices for the blunt-nosed leopard lizard, *Gambelia silus*, at the Pixley National Wildlife Refuge. U.S. Fish and Wildlife Service, Delano, CA, Contract Nos. 10181-9810-3(js) and 10181-4672-4, 34 pp. + Appendices.
- URS Corporation (URS). 2013. (DRAFT) Biological Assessment. Hydrogen Energy California, Kern County, California. February 2013. 95 pp.
- USFWS (U.S. Fish and Wildlife Service). 1980. Blunt-nosed leopard lizard recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon. 61 pp.
- USFWS (U.S. Fish and Wildlife Service). 1989. Standardized recommendations for the protection of the San Joaquin kit fox. April 1989.
- USFWS (U.S. Fish and Wildlife Service). 1990. Endangered and threatened wildlife and plants. Federal Register. 50(35): 6184-6229.
- USFWS (U.S. Fish and Wildlife Service). 1995. Blunt-nosed leopard lizard revised recovery plan. U.S. Fish and Wildlife Service, Portland, OR. 85 pp.
- USFWS (U.S. Fish and Wildlife Service). 1996. Endangered and threatened wildlife and plants; Review of plant and animal taxa that are candidates for listing as endangered or threatened species. Federal Register. 61(40): 7596-7613.
- USFWS (U.S. Fish and Wildlife Service). 1998. Recovery Plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.
- USFWS (U.S. Fish and Wildlife Service). 1999. Standardized recommendations for the protection of the San Joaquin kit fox prior to or during ground disturbance. Unpublished protocol prepared by U.S. Fish and Wildlife Service, Sacramento, California. 7 pp.

- USFWS (U.S. Fish and Wildlife Service). 2000. Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants. United States Fish and Wildlife Service. January 2000.
- USFWS (U.S. Fish and Wildlife Service). 2006. Least Bell's Vireo (*Vireo bellii pusillus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California. September 2006. 27 pp.
- USFWS (U.S. Fish and Wildlife Service). 2010. Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California. February 2010. 102 pp.
- USFWS (U.S. Fish and Wildlife Service). 2010b. *Monolopia (=Lembertia) congdonii* (San Joaquin woolly-threads) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California. June 2010. 32 pp.
- USFWS (U.S. Fish and Wildlife Service). 2011. U.S. Fish and Wildlife Service Standardized Recommendations For Protection Of The Endangered San Joaquin Kit Fox Prior To Or During Ground Disturbance. Prepared by the Sacramento Fish And Wildlife Office, January 2011. 9 pp.
- USFWS (U.S. Fish and Wildlife Service). 2013. *Eremalche kernensis* (Kern Mallow) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California. 73 pp.
- USFWS (U.S. Fish and Wildlife Service). 2015a. Information, Planning, and Conservation System (IPaC). Unofficial IPaC Trust Resource Report obtained online at: <http://ecos.fws.gov.ipac>.
- USFWS (U.S. Fish and Wildlife Service). 2015b. Environmental Conservation Online System (ECOS). Critical Habitat Portal for Threatened and Endangered Species. Available online at: <http://ecos.fws.gov/crithab/>.
- USFWS (U.S. Fish and Wildlife Service). 2015c. Environmental Conservation Online System (ECOS). Species profiles available online at: <http://ecos.fws.gov>.
- Wilbur, S.R. 1978. The California condor, 1966-76: A look at its past and future. U.S. Fish and Wildlife Service North America Fauna 72:1-136.
- Williams, D. F. 1980. Distribution and population status of the San Joaquin antelope squirrel and the giant kangaroo rat. California Department of Fish and Game, Nongame Wildlife Investigation Report E-W-4, IV-10.1. 45 pp.
- Williams, D. F. 1986. Mammalian species of special concern in California. California Department of Fish and Game, Wildlife Management Division, Administrative Report. 86-1. 112 pp.

- Williams, D.F. 1992. Geographic distribution and population status of the giant kangaroo rat, *Dipodomys ingens* (Rodentia, Heteromyidae). Pp. 301-325, in *Endangered and sensitive species of the San Joaquin Valley, California* (D.F. Williams, S. Byrne, and T.A. Rado, eds.). California Energy Commission, Sacramento, 388 pp.
- Williams, D.F., and D.J. Germano. 1991. Effects of livestock grazing on endangered species at Pixley National Wildlife Refuge, Tulare County, California. U.S. Fish and Wildlife Service, Kern National Wildl. Refuge, Delano, CA, Order No. 10181-11764(BW), 33 pp.
- Williams, D.F., H.H. Genoways, and J.K. Braun. 1993. Population studies of endangered kangaroo rats and blunt-nosed leopard lizards in the Carrizo Plain Natural Area, California. California Department of Fish and Game, Nongame Bird and Mammal Sec., Rep 93-01:1-114.
- Williams, D.F. and K.S. Killburn. 1991. *Dipodomys ingens*. *Mammal Species*. 377:1-7.
- Zarn, M. 1974. Habitat management for unique or endangered species. Burrowing owl, *Speotyto cunicularia hypugaea*, Report Number 11. Technical Note, U. S. Department of Interior, Bureau of Land Management. Denver, Colorado. 25 pp.
- Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer and M. White. 1990. California's wildlife. Volume I - amphibians and reptiles. Volume II - birds, and Volume III - mammals. California Department of Fish and Game. Sacramento, California.

**APPENDIX A**  
**REPRESENTATIVE PHOTOGRAPHS**



**Photograph 1**

View north of the proposed project site, from the west side of Tupman Road.



**Photograph 2**

View south of the proposed project site, taken from the west side of Tupman Road.



**Photograph 3**

View east from a proposed recharge basin in the project site.



**Photograph 4**

View west from a proposed recharge basin within the Palms project site.





**Photograph 5**

View north of plowed fields and an existing agricultural facility within the Palms project site.



**Photograph 6**

View west from the northern boundary of the Palms project site.



**Photograph 7**

A maintained canal within the project site, view east toward the Tule Elk State Natural Reserve.



**Photograph 8**

View south of a maintained irrigation ditch observed within the project site.



**Photograph 9**

View of existing BVWSD facilities within the proposed project site.



**Photograph 10**

A recently plowed field in the project site, east of Tupman Road.





**Photograph 11**

View of pistachios planted in the buffer area, north of Adohr Road.



**Photograph 12**

Cotton planted in the buffer area, east of and adjacent to the proposed project.



**Photograph 13**

View east along the southernmost pipeline alignment.



**Photograph 14**

View of buffer area south of project site, east of Tupman Road.



**Photograph 15**

View west of natural lands present south of the project boundary.



**Photograph 16**

View north of trespass dumping observed in the buffer area south of the project site.

# **PHASE I SURVEY, BVWSD PALMS PROJECT, KERN COUNTY, CALIFORNIA**

*Prepared for:*

Ms. Stephanie Breeden  
GEI Consultants, Inc.  
700 NE Multnomah Street, Suite 230  
Portland, OR 97232

*Prepared by:*

Peter A. Carey, M.A., RPA  
Associate Archaeologist

*and*

David S. Whitley, Ph.D., RPA  
Principal Investigator

ASM Affiliates  
20424 West Valley Blvd., Suite A  
Tehachapi, California 93561

December 2015

PN 22470.03





# TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
Management Summary .....	iii
<b>1. INTRODUCTION AND REGULATORY CONTEXT.....</b>	<b>1</b>
<b>2. ENVIRONMENTAL AND CULTUAL BACKGROUND.....</b>	<b>5</b>
2.1 ENVIRONMENTAL BACKGROUND.....	5
2.2 GEOARCHAEOLOGICAL BACKGROUND .....	5
2.3 ETHNOGRAPHIC BACKGROUND .....	7
2.4 Archaeological Background.....	8
2.5 HISTORICAL background .....	11
<b>3. ARCHIVAL RECORDS SEARCH.....</b>	<b>17</b>
3.1 Previous Canal surveys.....	20
<b>4. METHODS AND RESULTS.....</b>	<b>19</b>
4.1 INVENTORY RESULTS.....	19
<b>5. SUMMARY AND RECOMMENDATIONS.....</b>	<b>21</b>
5.1 RECOMMENDATIONS.....	21
<b>REFERENCES .....</b>	<b>23</b>
<b>Confidential Appendices .....</b>	<b>27</b>
<b>Confidential Appendix A:.....</b>	<b>29</b>
<b>Site Record .....</b>	<b>29</b>
<b>Confidential Appendix B: .....</b>	<b>30</b>
<b>Isolate Records.....</b>	<b>30</b>

## LIST OF FIGURES

	<u>Page</u>
Figure 1. Location of the BVWSD Palms Project survey area, Kern County, California. ....	4
Figure 2a. Unnamed canal lateral, looking north.....	6
Figure 2b. Southernmost survey parcel, looking east. ....	6

## LIST OF TABLES

Page

Table of Contents

---

Table 1.	Survey Reports Within the Project Area.....	15
Table 2.	Survey Reports Within .5-mi of the Project Area.....	16
Table 3.	Resources Within .5-mi of the Project Area .....	17
Table 4.	Isolated Artifacts – The Palms Project.....	20

---

## MANAGEMENT SUMMARY

An intensive Phase I cultural resources survey was conducted for the Buena Vista Water Storage District (BVWSD) Palms Project (Project), near Buttonwillow, Kern County, California. This study was conducted by ASM Affiliates, Inc., with David S. Whitley, Ph.D., RPA, serving as principal investigator. Background studies and fieldwork for the survey were completed in August and September 2015. The study was undertaken to assist with California Environmental Quality Act (CEQA) compliance.

A records search of site files and maps was conducted on August 4, 2015, at the Southern San Joaquin Valley Archaeological Information Center (AIC), California State University, Bakersfield. A search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed on September 17, 2015. These investigations determined that the study area had not been previously surveyed in its entirety but portions of ten historical linear sites, all canals or ditches, were within it. Previous evaluations of these historical resources determined that they were not significant or unique. No sacred sites or traditional cultural places had been identified within or adjacent to the study area.

The Phase I survey fieldwork was conducted in August and September 2015, with parallel transects spaced at 15-meter (m) intervals walked along the approximately 1,160-acre (ac) survey area, and buffers of 50-ft on each side of the pipeline route.

No significant historical resources or properties were discovered within the study area. Based on these findings, construction of the recharge cells and pipelines do not have the potential to result in adverse impacts to significant historical resources or properties, and no additional cultural resource studies are recommended.



# 1. INTRODUCTION AND REGULATORY CONTEXT

ASM Affiliates was retained by GEI Consultants, Inc., to conduct an intensive Phase I cultural resources survey for the Buena Vista Water Storage District (BVWSD) Palms Project study area, near Buttonwillow, Kern County, California. The Project Area of Potential Effect (APE) was defined as the area of direct ground surface disturbance. The cultural resources survey covered the entirety of the APE, with 50-ft buffers.

The purpose of this archaeological investigation was to assist with California Environmental Quality Act (CEQA) compliance for development of the above locations. The investigation was undertaken, specifically, to ensure that significant impacts to historical resources do not occur as a result of project construction.

This current included:

- A background records search and literature review to determine if any known archaeological sites were present in the project zone and/or whether the area had been previously and systematically studied by archaeologists;
- A search of the NAHC *Sacred Lands File* to determine if any traditional cultural places or cultural landscapes have been identified within the area;
- An on-foot, intensive inventory of the study area to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

This study was conducted by ASM Affiliates, Inc., of Tehachapi, California, during August and September 2015. David S. Whitley, Ph.D., RPA, served as principal investigator and Rob Azpitarte, B.A., ASM Associate Archaeologist, conducted the fieldwork with the assistance of Stacey Escamilla, B.A., Amber Tedrow, B.A., Mercedes Bandimere, B.A., Jeff Stephens, B.A., and Mike Huerta, A.A.

This document constitutes a report on the Phase I survey. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; a summary of the field surveying techniques employed; and the results of the fieldwork. We conclude with management recommendations for the Project area.

## 1.1 PROJECT LOCATION

The Project area is located approximately 5.7-miles (mi) southeast of Buttonwillow and 16-mi west of Bakersfield, Kern County, California. This places it towards the southern end and on the open flats of the San Joaquin Valley, a large interior and relatively low-lying valley that drains northwards to the San Francisco Bay. While the study area is a significant distance from the Pacific Ocean, elevation is only approximately 290-feet (ft) above mean seal level (amsl). The Project area is situated south of Adohr Road and a majority of the Project area is situated west of Tupman Road, with a small portion to the east of Tupman Road. The entire Project area is located north of the California Aqueduct.

The proposed Palms Project will total approximately 1,100-acres in Sections 9, 10, 11, 14, 15, and 23, Township 30 South, Range 24 East (T30S/R24E), Mount Diablo Base and Meridian (MDBM; Figure 1).

## **1.2 PROJECT DESCRIPTION**

The proposed Palms Project is a groundwater replenishment and water banking project that will entail the removal of irrigated lands and conversion of these lands to recharge facilities. The Project involves multiple stages: 1) construction of recharge facilities, 2) installation of pumps in existing wells and approximately 4 miles of pipeline, 3) construction and equipping additional recovery wells with associated piping, and 4) water treatment facilities if needed. Stages 3 and 4 primarily involve the recovery aspect and would be constructed at a later date. Construction of stages 1 and 2 would include activities consistent with digging, trenching, and excavation of soil to create water holding ponds and channels, and the installation new pipeline. Linear trenches would be excavated around the perimeter of the water holding facilities to install approximately 16,500 feet of 24-inch-diameter pipe and another 5,000 feet of 36 inch pipe to convey water recovered from the Palms project area. Approximately 4-mi of pipelines will be installed, primarily on the west and south sides of the Project area running along, but separate from, the West Side Canal. Additionally, pipeline will be installed along an unnamed lateral of the East Side Canal to connect that canal to the recharge system.

## **1.3 REGULATORY CONTEXT**

### **1.3.1 CEQA**

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when “historically significant” or “unique” cultural resources are adversely affected, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for or by listing in the California Register of Historical Resources (CRHR). The criteria for listing historically significant cultural resources in the CRHR are as follows (see PRC § 5024.1, Title 14 CCR, Section 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

- (A) Are associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- (B) Are associated with the lives of persons important in our past;
- (C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or
- (D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA are those that represent:

an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigating adverse impacts to significant or unique cultural resources.



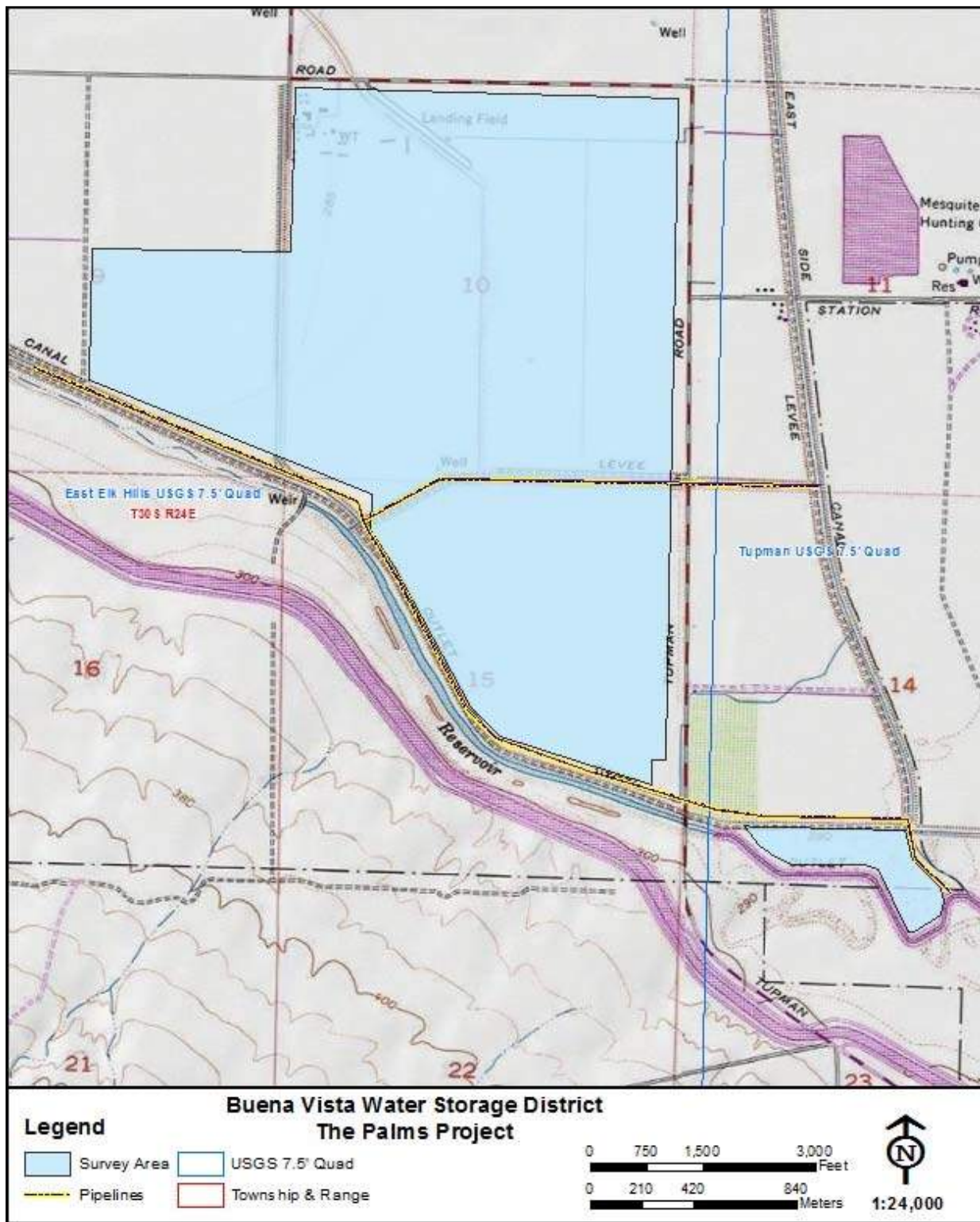


Figure 1. Location of the BVWSD Palms Project survey area, Kern County, California.

---

## **2. ENVIRONMENTAL AND CULTURAL BACKGROUND**

### **2.1 ENVIRONMENTAL BACKGROUND**

At the time of the Phase I study, the Project study area consisted of and was surrounded by fallow farm fields (Figure 2a and 2b). Although this location currently may be characterized as a dry open valley bottom, the study area is located within the historical Kern River Delta area. Prior to reclamation and channelization, the region would have been a low lying, water rich area characterized by sloughs, marshes and swamps. While occasionally inundated by floodwaters, in most years the region would have been marshy during the winter rainy season.

Historical and recent land-use has thus changed the vegetation that was once present within and near the Project area. However, it is likely that Riparian Woodlands were once found along drainages in the general vicinity. Although the Project area may have included the Valley Grassland community, depending upon drainage and seasonal storm systems, freshwater marshes may have also been present (see Schoenherr 1992).

### **2.2 GEOARCHAEOLOGICAL BACKGROUND**

Examination of the East Elk Hills (1932, 1:31,680) topographical quadrangle demonstrates that the Project area historically consisted of the Buena Vista Slough, a northern channel of the southern San Joaquin Valley basin consisting of low lying sloughs and swamps which experienced periodic flooding, drying, and, potentially, stripping. Although this does not preclude human use, especially seasonally, preserved habitations would be restricted to higher topography. Sporadic or seasonal use of the intervening areas (e.g., for hunting or plant gathering) would result in surficial archaeological deposits that were periodically re-worked by changing hydrological conditions, and thus are out of original context and lack integrity. This conclusion is confirmed by Meyer, Young, and Rosenthal (2010:137) who map the immediate soils in the project area as historic/modern, dating to the last 150 years, which are “found along active channels and lakeshores.” This indicates that the Project area has low subsurface archaeological sensitivity, and a low potential for subsurface archaeological disturbance.



**Figure 2a. Unnamed canal lateral, looking north.**



**Figure 2b. Southernmost survey parcel, looking east.**

## 2.3 ETHNOGRAPHIC BACKGROUND

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977) and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro-Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north. The result is an unfortunate scarcity of ethnographic detail on southern Valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous life-ways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

This scarcity of specific detail is particularly apparent in terms of southern valley tribal group distribution. According to Kroeber (1925:478), the Tulamni occupied the edges of Buena Vista Lake and the southwestern end of the valley; the Hometwoli lived in and around Kern Lake to the east; the Tuhohi (or Chuxoxi) resided near the mouth of Kern River as it drained north into Tulare Lake; and Yauelmani territory comprised the southeastern side of the valley extending north into Bakersfield proper. The study area lies near the boundaries of these tribes, but its specific territorial affiliation is unclear.

Regardless of tribal affiliation, historical village distribution was similar across the region. Villages were typically located along lakeshores and major stream courses (as these existed circa AD 1800). The study area lies within a region that, historically, contained a series of sloughs that connected Buena Vista Lake, to the south, with Goose Lake and Tulare Lake, to the north. Major historical winter-aggregation village locations on the west side of the San Joaquin Valley were typically located on higher ground above the sloughs, swamps and lakeshores, smaller, summer-dispersal camps may have been located on slight rises on the valley floor.

Most Yokuts groups, regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet; a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was assisted by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to most Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed the same each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps, often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher.

## **2.4 ARCHAEOLOGICAL BACKGROUND**

The southern San Joaquin Valley region has received minimal archaeological attention compared to other areas of the state. In part, this is because the majority of California archaeological work has concentrated in the Sacramento Delta, Santa Barbara Channel and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981). Based on these sources, the general prehistory of the region can be outlined as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 YBP (years before present). Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills



of the Sierra, and in the Mojave Desert proper. (In each case, these are locations many miles distant from the study area.)

Both fluted and stemmed points are particularly common around lake margins, suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time; little else is known about these earliest peoples. Additional finds consist of a Clovis-like projectile point discovered in a flash-flood cut-bank near White Oak Lodge in 1953 on Tejon Ranch (Glennan 1987a, 1987b). More recently, a similar fluted point was found near Bakersfield (Zimmerman et al. 1989), and a number are known from the Edwards Air Force Base and Boron area of the western Mojave Desert. Although human occupation of the state is well-established during the Late Pleistocene, relatively little can be inferred about the nature and distribution of this occupation with a few exceptions. First, little evidence exists to support the idea that these Paleo-Indians peoples were big-game hunters, similar to those found on the Great Plains. Second, the western Mojave Desert evidence suggests small, very mobile populations that left a minimal archaeological signature.

Substantial evidence for human occupation of California first occurs during the middle Holocene, roughly 7500 to 4000 YBP. This period is known as the *Early Horizon*, or alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Additionally, little evidence for Early Horizon occupation exists in most inland portions of the state, partly due to a severe cold and dry paleoclimatic period occurring at this time. Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4000 YBP during the *Middle Horizon* (or Intermediate Period). This period known climatically as the Holocene Maximum (circa 3800 YBP) and was characterized by significantly warmer and wetter conditions than previously experienced. Archaeologically, it was marked by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmill culture which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even rudimentary mound-building tradition (Meighan, personal communication, 1985). Along with ritual elaboration, Middle Horizon times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian speaking peoples (including the Yokuts) are also posited to have entered the state roughly at the beginning of this period and, perhaps to have brought this technology with them (cf. Moratto 1984). Likewise it appears the so-called "Shoshonean Wedge" in southern California or the Takic speaking groups that include the Gabrielino/Fernandeño, Tataviam and Kitanemuk, may have moved into the region at this time, rather than at about 1500 BP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the

Intermediate Period, when the population of the village may have been 50 or more people (King et al n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W & S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3500 YBP (Horne 1981). The Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W & S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W & S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W & S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all of these areas a major expansion in settlement, the establishment of large site complexes and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major southern California-wide occurrence and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo Plain suggests the origins of the tribelet level of political organization developed during this period (W & S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the study area, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1500 and 800 YBP, with a consensus for the shorter chronology. Increasing evidence suggests the importance of the Middle-Late Horizons transition (AD 800 to 1200) in the understanding of south-central California. This corresponds to the so-called Medieval Climatic Anomaly, a period of climatic instability that included major droughts and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is also believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90 percent of the interior populations in some regions including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of peoples into fewer but larger villages. What is clear is that Middle Period villages and settlements were widely dispersed across the landscape; many at locations that lack contemporary evidence of fresh water sources. Late Horizon sites, in contrast, are typically located where fresh water was available during the historical period, if not currently.

The subsequent Late Horizon can be best understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California; suggesting that ethnographic life-ways recorded by anthropologists extend roughly 800 years into the past.

The position of southern San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric

demographic trends for the southern San Joaquin Valley and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

## 2.5 HISTORICAL BACKGROUND

Spanish explorers first visited the southern end of the San Joaquin Valley in 1772, but its lengthy distance from the missions and presidios along the Pacific Coast delayed permanent settlement for many years, including during the Mexican period of control over the Californian region. In the 1840s, Mexican rancho owners along the Pacific Coast allowed their cattle to wander and graze in the San Joaquin Valley (JRP Historical Consulting 2009). The Mexican government granted the first ranchos in the southern part of the San Joaquin Valley in the early 1840s, but these did not result in permanent settlement. It was not until the annexation of California in 1848 that the exploitation of the southern San Joaquin Valley began (Pacific Legacy 2006).

The discovery of gold in northern California in 1848 resulted in a dramatic increase of population, consisting in good part of fortune seekers and gold miners, who began to scour other parts of the state. After 1851, when gold was discovered in the Sierra Nevada Mountains in eastern Kern County, the population of the area grew rapidly. Some new immigrants began ranching in the San Joaquin Valley to supply the miners and mining towns. Ranchers grazed cattle and sheep, and farmers dry-farmed or used limited irrigation to grow grain crops, leading to the creation of small agricultural communities throughout the valley (JRP Historical Consulting 2009).

After the American annexation of California, the southern San Joaquin Valley became significant as a center of food production for this new influx of people in California. The expansive unfenced and principally public foothill spaces were well suited for grazing both sheep and cattle (Boyd 1997). As the Sierra Nevada gold rush presented extensive financial opportunities, ranchers introduced new breeds of livestock, consisting of cattle, sheep and pig (Boyd 1997).

With the increase of ranching in the southern San Joaquin came the dramatic change in the landscape, as non-native grasses more beneficial for grazing and pasture replaced native flora (Preston 1981). After the passing of the Arkansas Act in 1850, efforts were made to reclaim small tracts of land in order to create more usable spaces for ranching. Eventually, as farming supplanted ranching as a more profitable enterprise, large tracts of land began to be reclaimed for agricultural use, aided in part by the extension of the railroad in the 1870s (Pacific Legacy 2006).

Following the passage of state wide 'No-Fence' laws in 1874, ranching practices began to decline, while farming expanded in the San Joaquin Valley in both large land holdings and smaller, subdivided properties. As the farming population grew, so did the demand for irrigation. Settlers began reclamation of swampland in 1866, and built small dams across the Kern River to divert water into the fields. By 1880, 86 different groups were taking water from the Kern River. Ten years later, 15 major canals provided water to thousands of acres in Kern County.

During the period of reclaiming unproductive land in the southern San Joaquin Valley, grants were given to individuals who had both the resources and the finances to undertake the operation alone. One small agricultural settlement, founded by Colonel Thomas Baker in 1861 after procuring one such grant, took advantage of reclaimed swampland along the Kern River. This settlement became



the City of Bakersfield in 1869, and quickly became the center of activity in the southern San Joaquin Valley, and in the newly formed Kern County. Located on the main stage road through the San Joaquin Valley, the town became a primary market and transportation hub for stock and crops, as well as a popular stopping point for travelers on the Los Angeles and Stockton Road. The Southern Pacific Railroad reached the Bakersfield area in 1873, connecting it with important market towns elsewhere in the state, dramatically impacting both agriculture and oil production (Pacific Legacy 2006).

Three competing partnerships developed during this period which had a great impact on control of water, land reclamation and ultimately agricultural development in the San Joaquin Valley: Livermore and Chester, Haggin and Carr, and Miller and Lux, perhaps the most famous of the enterprises. Livermore and Chester were responsible, among other things, for developing the large Hollister plow (three feet wide by two feet deep), pulled by a 40 mule team, which was used for ditch digging. Haggin and Carr were largely responsible for reclaiming the beds of the Buena Vista and Kern lakes, and for creating the Calloway Canal, which drained through the Rosedale area in Bakersfield to Goose Lake (Morgan 1914). Miller and Lux ultimately became one of the biggest private property holders in the country, controlling the rights to over 22,000 square miles. Miller and Lux's impact extended beyond Kern County, however. They recognized early-on that control of water would have important economic implications, and they played a major role in the water development of the state. They controlled, for example, over 100 miles of the San Joaquin River with the San Joaquin and Kings River Canal and Irrigation System ([http://en.wikipedia.org/wiki/Henry\\_Miller\(rancher\)](http://en.wikipedia.org/wiki/Henry_Miller(rancher))). They were also embroiled for many years in litigation against Haggin and Carr over control of the water rights to the Kern River. Descendants of Henry Miller continue to play a major role in California water rights, with his great grandson, George Nickel, Jr., the first to develop the concept of water banking, thus creating a system to buy and sell water (<http://exiledonline.com/california-class-war-history-meet-the-oligarch-family-thats-been-scamming-taxpayers-for-150-years-and-counting/>).

The San Joaquin Valley was dominated by agricultural pursuits until the oil boom of the early 1900s, which saw a shift in the region, as some reclaimed lands previously used for farming were leased to oil companies. Nonetheless, the shift of the San Joaquin Valley towards oil production did not halt the continued growth of agriculture (Pacific Legacy 2006). The Great Depression of the 1930s brought with it the arrival of great number of migrants from the drought-affected Dust Bowl region, looking for agricultural labor. These migrants established temporary camps in the valley, staying on long past the end of the drought and the Great Depression, eventually settling in towns such as Bakersfield where their descendants live today (Boyd 1997).

The community of Buttonwillow is the closest population center to the study area, with roughly 1,500 inhabitants. It was established in 1895, with the creation of its first post office, and was then known as Buena Vista. It was more commonly known as Buttonwillow due to the presence of a lone buttonbush (*Cephalanthus occidentalis*) at this location, supposedly used as a meeting place by the Yokuts, and eventually became known by this name. Miller and Lux created the first store in the community, which served the local ranching and agricultural community ([https://en.wikipedia.org/wiki/Buttonwillow,\\_California](https://en.wikipedia.org/wiki/Buttonwillow,_California)). Although it is close to the Elk Hills oil field, most of its residents are employed in agriculture, signaling the fact that farming and oil

production continue to be the primary economic activities in this portion of western Kern County, into the twenty-first century.

### **2.5.1 Reclamation of the Buena Vista Slough and the Kern River**

#### **Miller & Lux**

Charles Lux was born in 1823 in Hatten, Germany, to a wheelwright in a German Catholic family. Henry Miller was born in 1827 in Wurttemberg, Germany, as Heinrich Alfred Kreiser, whose father was a master butcher and cattle trafficker. By their teenage years, both Lux and Kreiser left Germany for America, like so many German emigrants in the 1830s and 1840s, for better opportunity and a chance to own land of their own (Igler 2001). Lux arrived in New York in 1839 and apprenticed with a butcher until he saved enough money to move to San Francisco ten years later. Kreiser arrived in New York in 1847 and worked at a hog shop until he was offered a ticket to San Francisco by an acquaintance named Henry Miller. The ticket was in Miller's name and was non-refundable and non-transferrable. Kreiser took the opportunity to head west under the name of Henry Miller, by which he was known as until his death in 1916.

After their respective arrivals in San Francisco, both Lux and Miller found work employed as butchers and soon saved enough money to each become independent proprietors. Lux went into partnership with an Englishman named Alfred Edmondson and purchased 1,700 acres of Rancho Buri Buri. A few years later, Lux bought out his partner and met Miller, with whom he purchased 1,600 head of cattle. In 1858, Miller and Lux formed a permanent partnership until Charles Lux's death in 1887. Their main offices were in San Francisco, and over the tenure of their partnership, they acquired hundreds of thousands of cattle ranching land in California, Oregon, and Nevada (Igler 2001).

In 1868, Miller and Lux purchased land in Kern County with local rancher James C. Crocker, who convinced them that they could produce prime cattle for their northern ranches. As the largest landowners of the area, Miller and Lux planned to reclaim the land around the Buena Vista Slough. This land, which would in the next century come under the management of the BVWSD, included a large flood plain that, if not reclaimed in a timely manner, could flood and ruin reclamation efforts. Water from the delta of the Kern River would flood and then fill the beds of Kern and Buena Vista Lake, from which the water would continue through the Buena Vista Slough to form a swamp that would eventually drain into Tulare Lake. Lux formed the Kern Valley Water Company to begin reclamation efforts. Other land owners participated in the reclamation of the Buena Vista Slough including Frederick Cox, C.W. Clarke (predecessor of Carmel Cattle Company), John H. Reddington, George N. Cornwell, L.H. Bonestell, Horatio B. Livermore, and Horatio Stabbins. Miller and Lux owned approximately 37,000 acres of the land in the area, and as such owned a large percentage of stock in the company (Woolley 1963; 1927). In early 1877, Miller and Lux fortuitously hired the massive workforce of men recently unemployed by the Southern Pacific Railroad after having just finished laying the final tracks from northern California to Kern County (Igler 2001). Between 200 to 300 manual laborers, foremen, blacksmiths, and carpenters were given food and housing in these months working on reclaiming the Buena Vista Slough, a swamp that was approximately 50 miles long and several miles wide (Igler 2001). That same year, the Kern Valley Water Company Canal (now called the Kern River Flood Canal) and

the East Side Canal were completed. However, lack of water resulted in the slaughtering of cattle while the reclamation efforts were well underway. In addition to the drought, James Haggin, a business tycoon from Kentucky, quickly bought up thousands of acres of land upstream from Miller and Lux's landholdings along the Kern River and soon owned nearly every irrigation ditch along the river. This resulted in no water reaching Miller and Lux's land, as well as angering hundreds of other landowners in the area who were beholden to Haggin for irrigation water for their farmlands (Iglesias 2001). In 1879, Miller and Lux filed a lawsuit against Haggin, which they ultimately won but which resulted in the division of the Kern River to Haggin's interests and Miller and Lux to the south. Reclamation efforts continued.

In 1888, Miller and Lux purchased the land holdings of Reddington, Bonestell, and Livermore. The following year, Clarke conveyed another 4,520 acres to Miller and Lux (Woolley 1963). At the turn of the twentieth century, Miller and Lux held over 84% of the total land holdings. By 1913, a demand for the extension north toward Wasco Road of the original Kern Valley Water Company Canal resulted in the formation of the Kern Valley Reclamation Company, of which Miller and Lux owned approximately 94% interest with Carmel Cattle Company owned approximately 6% (Woolley 1963; 1927). The Kern Valley Reclamation Company also constructed the Kern Valley Reclamation Company Canal the following year. By 1916, both Miller and Lux were deceased, but their land irrigation company continued to function. The Main Drain irrigation canal began construction the same year of Miller's death in 1916, and was not completed until 1918.

### **Formation of the BVWSD**

As early as July 1922, the first proposal was made for the formation of the BVWSD, consisting of 125,890 acres of land. When it was formally organized in 1924, the district acquired the Kern Valley Water Canal from the Kern Valley Water Company for \$42,000. From the Kern Valley Reclamation Company, it acquired the Kern Valley Reclamation Company's Canal and Goose Lake Canal for \$128,000. In 1927, the proprietors of Miller and Lux's land holdings contractually agreed that all water regulation would be maintained by the BVWSD. By the 1920s, the "L" canal, the 17 extension, the Belridge Ditch, and the Cox Canal had been constructed. Vlasnik Road Ditch and Canal 17 were not completed until circa 1940, according to historic maps. The associated ditches of the Cox Canal were not completed until circa 1950. Today, the BVWSD manages approximately 130,000 acre-feet of water per year from the Kern River, in addition to 21,000 acre-feet of water from the State Water Project (BVWSD 2015).



### 3. ARCHIVAL RECORDS SEARCH

An archival records search was conducted at the California State University, Bakersfield, Southern San Joaquin Valley Archaeological Information Center (AIC), by AIC staff members to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the Palms Project study area; (ii) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field project was known to contain archaeological sites and to thereby be archaeologically sensitive. Additionally, a search of the NAHC *Sacred Lands File* was conducted in order to ascertain whether traditional cultural places or cultural landscapes had been identified within the APE. The results of this archival records search are summarized here.

The records search at the AIC indicated that one previous archaeological survey (KE-04072) had been completed within the project area (Table 1) and another 17 had been completed within .5-mi of the project area (Table 2). Thirty-two archaeological resources were identified within .5-mi of the project area (Table 3). Of the 32 identified resources, 21 are prehistoric, 10 are historic, and 1 is a multi-component historic and prehistoric site. The NAHC *Sacred Lands File* did not indicate the presence of any cultural places within the project area.

In addition to the record search and NAHC *Sacred lands File* request, other resources were addressed to assist in local agriculture and irrigation history. Surveys conducted by ArchaeoPaleo Resource Management, Inc. (2013) and ASM Affiliates, Inc. (2015) for CEQA compliance covered portions of the East Side Canal and West Side Canal, which border the project area on the east and south-southwest sides, respectively. Though both resources lay outside the current project area, laterals located within the project area connect to the canals; therefore, information on those canals is provided below.

A farm complex constructed in the early-1950s (BVWSD personal communication 2015) is present at the northwest corner of the project area and will not be impacted by the Project. It was therefore not included in the Project APE and not recorded during the current survey.

**Table 1. Survey Reports Within the Project Area.**

<b>Report No (KE-)</b>	<b>Year</b>	<b>Author(s)/Affiliation</b>	<b>Title</b>
04072	2010	Madeleine Bray, Candace Ehringer, and Damien Tietjen	Phase I Cultural Resources Assessment for the West Kern Water District Project, Kern County, California.

**Table 2. Survey Reports Within .5-mi of the Project Area.**

<b>Report No (KE-)</b>	<b>Year</b>	<b>Author(s)/Affiliation</b>	<b>Title</b>
00142	1997	Catherine Lewis Pruett, Peggy Murphy, and Dorothy Fleagle/ Three Girls and a Shovel	Addendum I: Emergency Flood Area. A Cultural Resources Assessment and Plan for the Kern Water Bank Authority Project Near Bakersfield, Kern County, CA
00924	1991	Peak and Associates, Inc.	Cultural Resource Assessment of Sample Areas of Naval Petroleum Reserve No. 1, Kern County, California
01810	1983	Jim Woodward	Proposed Capture Pen & Buried Telephone Line
01811	1992	Leslie Hartzell/ UC Davis	Hunter-Gatherer Adaptive Strategies and Lacustrine Environments in the Buena Vista Lake Basin, Kern County, CA
02015	1991	Gary Reinoehl/ Department of Parks and Recreation	Tule Elk State Reserve Cultural Resources Survey
02268	1998	Thomas Jackson, Lisa Shapiro, and Jerome King/ Pacific Legacy, Inc.	Prehistoric Archaeological Resources Inventory and Evaluation of Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, CA
02269	1997	Thomas Jackson, Lisa Shapiro, and Gwyn Alcock/ Pacific Legacy, Inc.	Prehistoric Archaeological Extended Inventory Research at Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, CA
02278	1999	Mike Avina/ Jones & Stokes Associates, Inc.	Cultural Resources Inventory Report for Williams Communications, Inc. Fiber Optic Cable System Installation Project, San Luis Obispo to Bakersfield, Volume I
02375	1999	Thomas L. Jackson, Lisa A. Shapiro, and Jerome H. King/ Pacific Legacy, Inc.	Prehistoric Archaeological Resources Inventory and Evaluation at Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, CA
02885	2004	Marla Mealey/California State Parks Southern Service Center	Archaeological Testing Report for the Restroom Replacement Project at Tule Elk State Reserve
03054	2005	Scott Billat/ Earth Touch	New Tower ("NT") Submission Packet: Semitropic CA-3224A
03508	1997	Thomas Jackson and Lisa Shapiro/ Pacific Legacy, Inc.	Cultural Resources Management Plan Naval Petroleum Reserve No. 1, Elk Hills, Kern County, CA
03509	1997	PAR Environmental Services, Inc.	Historic Resources Evaluation and Assessment Report of Western Naval Petroleum Reserve No. 1, Elk Hills, Kern County, CA
03767	2010	Catherine Lewis Pruett/ Three Girls and a Shovel	A Cultural Resources Assessment for Three Possible Locations for a Water Turnout and Underground Pipeline from the California Aqueduct to the West Side Canal, Kern County, CA
03868	2005	Carrie D. Wills/ Michael Brandman Associates, Irvine, CA	Phase I Cultural Resource Survey Palm Ranch Dairy Project Unincorporated Kern County, CA
03869	2005	Carrie D. Wills/ Michael Brandman Associates, Irvine, CA	Addendum to Phase I Cultural Resource Survey: Phase II Testing Results Palm Ranch Dairy Project Unincorporated Kern County, CA
04428	2013	Hubert Switalski and Robert Larkin/ Stantec	Cultural and Paleontological Resources Survey Report for Modified Alignment of CO2 Supply Line and Facility Construction (Section 26S), Elk Hills, Kern County, California



**Table 3. Resources Within .5-mi of the Project Area**

<b>Primary No (P-15-)</b>	<b>Trinomial (CA-KER-)</b>	<b>Type</b>	<b>Age</b>	<b>Description</b>
000124	124	Site	Prehistoric	Lithic scatter
000125	125	Site	Prehistoric	Lithic scatter
000126	126	Site	Prehistoric	Lithic scatter, habitation debris
000358	358	Site	Prehistoric	Lithic scatter, chipped shell and bone
000359	359	Site	Prehistoric	Lithic scatter
001612	1612	Site	Prehistoric	Lithic scatter, elk pellets
002414	2414	Site	Prehistoric	Lithic scatter, habitation debris
002415	2415	Site	Prehistoric	Lithic scatter
002416	2416	Site	Prehistoric	Lithic scatter
002417	2417	Site	Prehistoric	Lithic scatter, habitation debris
002419	2419	Site	Prehistoric	Lithic scatter
002420	2420	Site	Prehistoric	Lithic scatter
003253	3253H	Site	Historic	Trash scatter
005984	5018	Site	Prehistoric	Lithic scatter
006776	5401	Site	Prehistoric	Lithic scatter, shell scatter
011157	6504	Site	Prehistoric	Lithic scatter, habitation debris
013725	7701H	Structure	Historic	Canal/aqueduct (East Side Canal)
015676	8655H	Site	Historic	Trash scatter
015677	8656H	Site	Historic	Trash scatter
015678	N/A	Isolate	Historic	Glass insulator
015688	8662/H	Site	Prehistoric/ Historic	Lithic scatter, habitation debris/ Foundations, trash scatter
015690	N/A	Building	Historic	Pump house
015819	8697H	Structure	Historic	Canal/aqueduct (West Side Canal)
015820	8698H	Structure	Historic	Canal/aqueduct (California Aqueduct)
015821	N/A	Isolate	Prehistoric	Chert flake
015822	8699	Site	Prehistoric	Lithic scatter
015823	N/A	Isolate	Prehistoric	“Obsidian needle”
015824	N/A	Isolate	Historic	Listerine bottle
015825	N/A	Isolate	Prehistoric	Chert flake
015826	N/A	Isolate	Historic	Listerine bottle
015827	8700	Site	Prehistoric	Lithic scatter
016496	9076	Site	Prehistoric	Lithic scatter, shell scatter

### 3.1 PREVIOUS CANAL SURVEYS

Surveys conducted by ArchaeoPaleo Resource Management Inc. (2013) and ASM Affiliates, Inc. (2015) for CEQA compliance covered portions of the East Side Canal and West Side Canal. A resurvey was not undertaken during the current study as the canals lay outside of the current project area; however, information on the canals is important given their proximity to the study area and the presence of laterals from these canals within the project area.

---

### **3.1.1 P-15-016998 (CA-KER-9372H)/P-15-013725 (CA-KER-7701H) – East Side Canal**

The East Side Canal is an irrigation canal constructed in 1876 by the Kern Valley Water Company, owned by Miller and Lux. It is a major canal of the larger Kern River Flood Canal District and has undergone alterations and improvements through the 1950s to present. 30-foot wide built-up levees flank either side of the canal. The depth of the canal is approximately 10-15 feet deep below the levees. The canal has undergone major alterations in alignment, shape, and depth; it does not retain integrity. It has been determined not significant.

### **3.1.2 P-15-017005 (CA-KER-9375H)/P-15-015819 (CA-KER-8697H) – West Side Canal**

The West Side Canal is an irrigation canal reportedly constructed prior to 1890, though only a small portion was present at that time. The segment of the West Side Canal that borders the project area on the west and south sides has existed since at least 1912 (ArchaeoPaleo Resource Management, Inc. 2013). The canal is an approximately 30-ft wide dredged canal with variable depth averaging approximately 10 to 15-ft. Over the years, the canal has undergone alterations in alignment, shape, and depth; it does not retain integrity. It has been determined not significant.



## 4. METHODS AND RESULTS

The project area totals approximately 1,100 acres, including recharge cells and pipelines with 50-ft buffer on either side (see Figure 1). The study area was examined with the field crew walking parallel transects through the project area and along the pipeline route spaced at 15-m intervals, in order to identify surface artifacts, archaeological indicators (e.g., shellfish or animal bone), and/or archaeological deposits (e.g., organically enriched midden soil); tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms.

Special attention was paid to rodent burrow back dirt piles, in the hope of identifying sub-surface soil conditions that might be indicative of archaeological features or remains. No cultural resources were collected during the survey.

The study area was surveyed by ASM Associate Archaeologists Rob Azpitarte, B.A. and Assistant Archaeologists Stacey Escamilla, B.A., Amber Tedrow, B.A., Mercedes Bandimere, B.A., Jeff Stephens, B.A., and Mike Huerta, A.A. Fieldwork was conducted in August and September 2015. Soils throughout the study area are sandy-silty alluvium with very few lithic clasts, reflecting a soils origin in deltaic processes. The study area consists of disked fields and existing, previously disturbed canals, roads, and structures.

### 4.1 INVENTORY RESULTS

One prehistoric site and 16 prehistoric isolates were identified during the survey.

#### 4.1.1 Newly Recorded Site

##### **RABV-1**

RABV-1 is a small, sparse prehistoric lithic scatter. The site was identified and recorded on August 25<sup>th</sup>, 2015 in a disked agriculture field entirely within the plow-zone. The site is located approximately 65-m east of an unnamed dirt road in Section 10 of Township 30 South, Range 24 East at an elevation of 288-ft amsl. Site dimensions are 39-m north-south by 15-m east-west. The field in which the site is located had recently been disked and therefore contained no vegetation. Soil on site is a loamy sand with dispersed granite and quartz clasts.

RABV-1 consists of seven cryptocrystalline silicate (CCS) flakes and one quartzite flake (A1-A8). A GIS sketch map was created for this site using a Trimble GEOEXPLORER 6000 Series. Eight artifacts were recorded, all of which are lithic debitage: A1 is a tan CCS secondary flake, A2 is a red CCS secondary flake, A3 is a white CCS secondary flake, A4 is a tan CCS secondary flake, A5 is a brown/gray piece of quartzite shatter, A6 is a tan/white CCS secondary flake, A7 is a tan piece of CCS shatter, and A8 is a tan CCS secondary flake. No diagnostic artifacts were identified at the site. Site condition is poor due to agricultural disturbance.

Due to the lack of temporal diagnostics or datable materials, the age of the site is unknown. It appears to consist of a very small lithic workshop.

### 4.1.2 Newly Recorded Isolates

In addition to the archaeological site, 16 isolated prehistoric artifacts were recorded within the APE. These are all examples of lithic debitage, none of which are temporally diagnostic. The presence of these artifacts, however, suggests that the general area was sporadically used for generalized hunting and/or gathering activities.

**Table 4. Isolated Artifacts – The Palms Project**

<b>Resource</b>	<b>Description</b>	<b>Section/Township/Range</b>
RA-ISO-1	Tan CCS core tool, 4.6 x 3.6 x 1.5 cm	Sec 10/T30S/R24E
RA-ISO-2	Tan CCS flake, 4.0 x 2.0 x 1.3 cm	Sec 10/T30S/R24E
RA-ISO-3	Tan CCS shatter, 4.5 x 3.0 x 1.5 cm	Sec 10/T30S/R24E
RA-ISO-4	Tan quartzite core, 5.0 x 4.5 x 3.5 cm	Sec 10/T30S/R24E
RA-ISO-5	Tan CCS flake tool, 4.0 x 3.5 x 1.5 cm	Sec 10/T30S/R24E
RA-ISO-6	Tan CCS shatter, 1.6 x 1.4 x 0.4 cm	Sec 10/T30S/R24E
RA-ISO-7	Tan CCS shatter, 1.9 x 1.4 x 0.6 cm	Sec 10/T30S/R24E
RA-ISO-8	Tan/white CCS primary flake, 3.0 x 2.5 x 1.0 cm	Sec 10/T30S/R24E
RA-ISO-9	Tan/white CCS primary flake, 1.9 x 1.8 x 0.4cm	Sec 10/T30S/R24E
RA-ISO-10	Gray/white CCS shatter, 4.7 x 2.4 x 1.3 cm	Sec 10/T30S/R24E
RA-ISO-11	Tan/white CCS shatter, 3.9 x 2.1 x 1.6 cm	Sec 10/T30S/R24E
RA-ISO-12	Tan CCS shatter, 3.0 x 2.3 x 1.6 cm	Sec 10/T30S/R24E
RA-ISO-13	Butterscotch CCS shatter, 4.3 x 3 x 1.8 cm	Sec 10/T30S/R24E
RA-ISO-14	Tan CCS shatter, 1.5 x 1.1 x 3.0 cm	Sec 9/T30S/R24E
RA-ISO-15	Brown/red CCS shatter, 3.3 x 2.5 x 0.6 cm	Sec 10/T30S/R24E
RA-ISO-16	Tan CCS re-fit flakes, 2.6 x 2.5 x 0.4 cm	Sec 11/T30S/R24E

---

## 5. SUMMARY AND RECOMMENDATIONS

An intensive Phase I archaeological survey was conducted for the BVWSD Palms Project study area, located near Buttonwillow, Kern County, California. A records search of site files and maps was conducted at the Southern San Joaquin Valley AIC and a search of the NAHC *Sacred Lands File* was completed. These investigations determined that the study area had not been previously surveyed in its entirety, and that no sites or sacred places had been recorded within it. Survey resulted in the recording of one prehistoric archaeological site, a low density surface lithic scatter given the temporary designation RABV-1, and 16 prehistoric isolated artifacts, within the Project area.

### 5.1 RECOMMENDATIONS

An archival records search, background studies, and an intensive, on-foot surface reconnaissance of the BVWSD Palms Project study area, Kern County, California, were conducted as part of a Phase I cultural resources survey. One prehistoric archaeological site, RABV-1, was recorded. This site consists of a low density lithic scatter. Although a formal determination of significance and test excavation has not been completed at this site, it has the potential to contain information useful for the understanding of local prehistory. Following CEQA, it is recommended that the significance of the site be established prior to project implementation, or that potential adverse impacts to it be mitigated by preservation in place.

The 16 isolated artifacts are categorically not significant under CEQA, with their recording having exhausted any research potential they might contain. No further work on or consideration of these isolated resources is therefore recommended. It is further recommended that an archaeologist be contacted in the unlikely event that archaeological resources are discovered during the construction or use of the Project area.



---

## REFERENCES

### ArchaeoPaleo Resource Management

- 2013 Paleontological Resources and Cultural Resources Phase I Assessment for the Buena Vista Water Storage District Northern Area Project, Kern County, California. Report on file, BVWSD.

### ASM Affiliates

- 2015 Phase I Survey/Class III Inventory, BVWSD Northern Pipeline Project, Kern County, California. Report on file, BVWSD.

### Buena Vista Water Storage District (BVWSD)

- 2015 Buena Vista Water Storage District homepage. <http://bvh2o.com/> (Accessed March 10, 2015).

### Cook, S. F.

- 1978 Historical Demography. In *California*, edited by R. F. Heizer, pp. 91-98. Handbook of North American Indians, Vol. 8, W. C. Sturtevant, general editor. Smithsonian Institute, Washington, D.C.

### Driver, H. E.

- 1937 Cultural Element Distributions: VI, Southern Sierra Nevada. *University of California Anthropological Records* 1(2):53-154. Berkeley.

### Elsasser, A.

- 1962 *Indians of Sequoia and Kings Canyon National Parks*. Three Rivers: Sequoia Natural History Association.

### Fenenga, F.

- 1952 The Archaeology of the Slick Rock Village, Tulare County, California. *American Antiquity* 17:339-347.

### Fredrickson, D.A. and J. Grossman

- 1977 A San Dieguito component at Buena Vista Lake, California. *Journal of California and Great Basin Anthropology* 4:173-190.

### Gayton, A. H.

- 1930 Yokuts-Mono Chiefs and Shamans. *University of California Publications in American Archaeology and Ethnology* 24:361-420. Berkeley
- 1948 Yokuts and Western Mono Ethnography. *University of California Anthropological Records* 10:1-290. Berkeley.



Gifford, E. W., and W. E. Schenck

- 1926 Archaeology of the Southern San Joaquin Valley. *University of California Publications in American Archaeology and Ethnology* 23(1):1-122.

Glennan, W.S.

- 1987a Concave-Based Lanceolate Fluted Projectile Points from California. *Prehistory of the Antelope Valley, California: An Overview*, R.W. Robinson, ed., *Antelope Valley Archaeological Society, Occasional Papers No.1*: 21-24.
- 1987b Evidence for Paleoeastern Culture Type in the Southwestern Great Basin. *Prehistory of the Antelope Valley, California: An Overview*, R.W. Robinson, ed., *Antelope Valley Archaeological Society, Occasional Papers No.1*:11-20.

Harrington, John Peabody

- n.d. Yokuts ethnographic notes. National Anthropological Archives, Washington, D.C..

Hewes, G.

- 1941 Archaeological reconnaissance of the central San Joaquin Valley. *American Antiquity* 7:123-133.

Horne, S.P.

- 1981 *The Inland Chumash: Ethnography, Ethnohistory and Archaeology*. Ph.D. dissertation, UCSB. University Microfilms, Ann Arbor.

Igler, David

- 2001 *Industrial Cowboys: Miller & Lux and the Transformation of the Far West, 1850-1920*. University of California Press: Berkeley.

Jones, T. L., G. M. Brown, L. M. Raab, J. L. McVickar, W. G. Spaulding, D. J. Kennett, A. York, and P. L. Walker

- 1999 Demographic Crisis in Western North America during the Medieval Climatic Anomaly. *Current Anthropology* 40:137-170.

King, C., C. Smith and T. King

- n.d. Archaeological Report Related to the Interpretation of Archaeological Resources Present at the Vasquez Rocks County Park. Report on file, UCLA AIC.

Kroeber, A.L.

- 1925 Handbook of the Indians of California. *Bureau of American Ethnology, Bulletin 78*. Washington, D.C.

Latta, F. F.

- 1977 *Handbook of the Yokuts Indians*. Bear State Books, Santa Cruz.

Meyer, J., D.C. Young and J.S. Rosenthal

- 2010 A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9, Cultural Resources Inventory of Caltrans Districts 6/9 Rural Conventional Highways. On file, SSJV Information Center, CSUB.
- Moratto, M  
1984 *California Archaeology*. New York: Academic Press.
- Morgan, W.A.  
1914 *History of Kern County, California with Biographical Sketches*. Los Angeles: Historic Record Company.
- Pacific Legacy, Inc.  
2006 *Southern San Joaquin Valley Oil Fields Comprehensive Study*. Manuscript on file, BLM Bakersfield office.
- Powers, Stephen  
1971 The Yokuts Dance for the Dead. In *The California Indians: A Source Book* (second edition), edited by R. F. Heizer and M. A. Whipple, pp. 513-519. University of California Press, Berkeley (original 1877).  
1976 *Tribes of California*. Berkeley, University of California Press (original 1877).
- Schiffman, R. A., and A. P. Garfinkel  
1981 *Prehistory of Kern County: An Overview*. Bakersfield College Publications in Archaeology No. 1.
- Schoenherr, A.A.  
1992 *A Natural History of California*. Berkeley: University of California Press.
- Sutton, M.Q.  
1988a An Introduction to the Archaeology of the Western Mojave Desert, California. *Archives of California Prehistory, No. 14*. Salinas: Coyote Press.  
1988b On the Late Prehistory of the Western Mojave Desert. *Pacific Coast Archaeological Society Quarterly* 24(1):22-29.
- W & S Consultants  
1994 Phase II Test Excavations and Determinations of Significance at CA- LAN-2133, -2233, -2234, -2235, -2236, -2240, -2241 and -2242, Los Angeles County, California. Manuscript on file, CSUF AIC.  
1999 Class III Inventory/Limited Archaeological Testing Program for the Ducor Telephone Project, Kennedy Meadows, Tulare County, California. Manuscript on file, CSUB AIC.  
2004 *Class II Inventory of the Carrizo Plain National Monument, San Luis Obispo County, California*. Report on file, BLM Bakersfield office.  
2006 *Phase II Test Excavations and Determinations of Significance for the Tejon Mountain Village Project, Kern County, California*. Report on file, Tejon Ranch Company.

Wedel, W.

- 1941 Archaeological Investigations at Buena Vista Lake, Kern County, California. *Bureau of American Ethnology Bulletin* 130.

Whitley, D.S.

- 1992 Shamanism and Rock Art in Far Western North America. *Cambridge Archaeological Journal* 2(1):89-113.  
2000 *The Art of the Shaman: Rock Art of California*. Salt Lake City: University of Utah Press.

Whitley, D.S. and M.P. Beaudry

- 1991 Chiefs on the Coast: The Development of Complex Society in the Tiquisate Region in Ethnographic Perspective. *The Development of Complex Civilizations in Southeastern Mesoamerica*, W. Fowler, ed., pp. 101-120. Orlando: CRC Press.

Whitley, D.S., G. Gumerman IV, J. Simon and E. Rose

- 1988 The Late Prehistoric Period in the Coso Range and Environs. *Pacific Coast Archaeological Society Quarterly* 24(1):2-10.

Whitley, David S., Joseph M. Simon and Johannes H.N. Loubser

- 2007 The Carrizo Collapse: Art and Politics in the Past. In *Collected Papers in Honor of the Achievements of Archaeologist Jay von Werlhof*, edited by Russell L. Kaldenberg, pp. 199-208. Maturango Museum Press No. 20. Ridgecrest, California.

Woolley, J.E.

- 1963 *Review of River History and Second Point Water Rights*. On file with the Buena Vista Water Storage District in Buttonwillow, California.

Unknown Author

- 1927 *Report of Board of Directors of Buena Vista Water Storage District to Hon. Edward Hyatt, Jr. State Engineer Upon District Plan*. On file with the Buena Vista Water Storage District in Buttonwillow, California.

Zimmerman, K.L., C.L. Pruett, and M.Q. Sutton

- 1989 A Clovis-Like Projectile Point from the Southern Sierra Nevada. *Journal of California and Great Basin Anthropology* 11:89-91.

**CONFIDENTIAL APPENDICES**



---

**CONFIDENTIAL APPENDIX A:**  
**SITE RECORD**

---

---

**CONFIDENTIAL APPENDIX B:**  
**ISOLATE RECORDS**

---

# **Assessment of Potential Groundwater Impacts**

## **Palms Groundwater Banking Project**

Prepared for:  
Buena Vista Water Storage District

Date: December 2, 2015  
Project No: 1506650



ASSESSMENT OF POTENTIAL GROUNDWATER IMPACTS  
PALMS GROUNDWATER BANKING PROJECT

Certifications and Seals

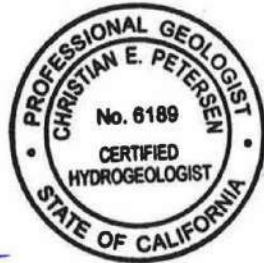
This report and analysis was prepared by the following GEI Consultants Inc. professional geologists.



exp 8/31/16

Date: 11/25/15

Project Geologist  
David Fairman  
California Certified Hydrogeologist 1000



exp 4/30/16

Date: 11/25/15

Principal Hydrogeologist  
Chris Petersen  
California Certified Hydrogeologist 463

# Table of Contents

---

<b><u>1</u></b>	<b><u>Introduction</u></b>	<b>1</b>
1.1	Project Location	2
1.2	Hydrologic Setting	2
<b><u>2</u></b>	<b><u>Geologic Conditions</u></b>	<b>6</b>
2.1	Regional Geology	6
2.2	Geologic Structures	8
2.3	Local Soils and Geology	11
<b><u>3</u></b>	<b><u>Hydrogeologic Conditions</u></b>	<b>14</b>
3.1	Aquifers	14
3.2	Confining Beds	14
3.3	Groundwater Levels	14
3.4	Groundwater Flow Direction	17
3.5	Hydraulic Characteristics	21
3.6	Sources of Water for Recharge	21
<b><u>4</u></b>	<b><u>Water Quality and the Environment</u></b>	<b>24</b>
4.1	Water Quality	24
	4.1.1 Groundwater Quality	24
	4.1.2 Source Water for Recharge	24
4.2	Environmental Records Search	24
<b><u>5</u></b>	<b><u>Assessment of Project Effects</u></b>	<b>29</b>
5.1	Approach	29
5.2	Project Effects on Groundwater Levels	29
5.3	Project Effects on Groundwater Quality	31
	5.3.1 Mitigation to Reduce Risk to Groundwater Quality Impacts	32
5.4	Summary of Project Impacts	32
<b><u>6</u></b>	<b><u>References</u></b>	<b>34</b>
	<b><u>Appendix A – Lower Kern River Rights and Obligations</u></b>	<b>36</b>
	<b><u>Appendix B – State Water Project Delivery of Article 21 Water</u></b>	<b>37</b>
	<b><u>Appendix C – Letter to Bureau of Reclamation</u></b>	<b>38</b>
	<b><u>Appendix D – EDR Report for Palms Project</u></b>	<b>39</b>

**Appendix E – HECA Phase I Environmental Site Assessment 40****Appendix F – HECA Phase II Environmental Site Assessment 41****Figures**

Figure 1:	Project Location	4
Figure 2:	Groundwater Subbasins	5
Figure 3:	Regional Geology	7
Figure 4:	Geologic Cross-Section G-G'	9
Figure 5:	Extent and Depth of the E-clay	10
Figure 6:	Hydrologic Soils Group	12
Figure 7:	Sediment Logs near the Palms Project	13
Figure 8:	Well Locations near the Palms Project	15
Figure 9:	Groundwater Level Hydrographs of Nearby Wells	16
Figure 10:	Regional Groundwater Elevation Contours - January to February 2009	18
Figure 11:	March 2012 Groundwater Elevation Contours	19
Figure 12:	Groundwater Flow Direction. The average gradient is 0.017 ft vertically/ft horizontally	20
Figure 13:	Monthly Kern River Flow at Bakersfield 1990 to 2015	23
Figure 14:	GeoTracker Sites	26
Figure 15:	Depth to Groundwater Map	30
Figure 16:	Predicted Recharge Mound Height	31

**Tables**

Table 1:	Recent Water Quality Summary	27
Table 2:	Maximum Measured Concentrations and Screening Levels for Constituents with Exceedances (mg/kg of soil)	28

# 1 Introduction

---

The Buena Vista Water Storage District (BVWSD or District) is planning to develop the Palms Groundwater Banking Project (Palms Project). The Palms Project is a groundwater replenishment and water banking project that will cover approximately 1,160 acres and will include features needed to apply surface water for groundwater recharge as well as facilities needed for recovery and treatment of stored groundwater. The Palms Project construction would include activities consistent with digging, trenching, and excavation of soil to create the water holding facilities and to install the new pipeline and wells for later recovery.

The Palms will enable the District to better sustain groundwater levels and improve groundwater quality, two objectives of California's Groundwater Sustainability Management Act. High quality water recharged by the Project will flow to aquifers that are sources for domestic and municipal wells providing water to residents of Taft and to the disadvantaged communities (DAC) of Buttonwillow and Tupman and to replenish groundwater under the Tule Elk Reserve.

Lands to be used by the Project have an established history of irrigated crop production but have not been farmed for 2 years. Retiring these lands from irrigated agriculture enables water to be delivered to the area based on availability of water for recharge rather than in response to the pattern of crop demand. Therefore, the timing of the deliveries will differ in a way that results in important benefits to groundwater in the Buttonwillow Service Area. Additionally, the surface water that would have been attributed to the project area will now be allocated to the balance of the District, providing all landowners an additional supply of surface water.

The District anticipates that removing irrigated land from production and converting this land to recharge facilities will reduce irrigation demand by approximately 3,300 acre-feet per year. While cessation of irrigation deliveries will eliminate deep percolation of irrigation water, the intentional recharge of high quality water will more than compensate for the reduction in deep percolation and will greatly reduce leaching of nitrates and other contaminants.

Earthwork would include construction of low berms with material for these berms being generated on-site by removal of surface soil that overlies shallow, highly permeable river-borne sand deposits. Recharge would be encouraged by retaining water in the canals and natural channels which run through the Palms Project area. Construction of recovery facilities would include installation of wells, pumps, pipelines and treatment facilities (if

required) needed for recovery of stored groundwater for use locally and for conveyance to banking associates.

The Project involves multiple stages: 1) construction of recharge facilities, 2) installation of pumps in existing wells and approximately 4 miles of pipeline, 3) construction and equipping additional recovery wells with associated piping, and 4) water treatment facilities if needed. Stages 3 and 4 primarily involve the recovery aspect and would be constructed at a later date. Construction of stages 1 and 2 would include activities consistent with digging, trenching, and excavation of soil to create water holding ponds and channels, and the installation new pipeline. Construction activity for recharge facilities would be completed within 6 months, while construction of recovery facilities would occur based on the rate of recovery and level of treatment needed to meet local needs and to fulfill banking agreements.

## **1.1 Project Location**

BVWSD is located about 16 miles west of Bakersfield along the western edge of the southern San Joaquin Valley as shown on **Figure 1**. The District lies entirely in Kern County and covers about 48,810 acres in two distinct service areas, the Buttonwillow Service Area (BSA) and the Maples Service Area (MSA). The MSA is smaller and located about 10 miles south of the BSA. The Palms Project is located at the southern tip of the BSA as shown on **Figure 1**.

## **1.2 Hydrologic Setting**

The Central Valley of California consists of the San Joaquin and the Sacramento valleys. The San Joaquin Valley, forming the southern two-thirds of the Central Valley, is a broad structural trough. It is bordered on the east by the Sierra Nevada and on the west by the Diablo and the Temblor ranges, which are a part of the Coast Ranges. The valley extends 220 miles southeastward from the confluence of the San Joaquin and the Sacramento rivers to the Tehachapi and the San Emigdio Mountains. The width of the valley ranges from 25 miles in the northern portion of the valley to 55 miles in the southern portion and averages about 35 miles (Croft, 1972).

BVWSD is located in the southwestern portion of the San Joaquin Valley. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern lakes.

BVWSD is located within the western edge of the Kern County groundwater subbasin (DWR, 2003) as shown in **Figure 2**. The subbasin is bounded on the north by the Kern County line and the Pleasant Valley, Tulare Lake, and Tule groundwater subbasins, on the east and southeast by the Sierra Nevada foothills and Tehachapi Mountains, and on the southwest and west by the San Emigdio Mountains and Temblor Range. The Tehachapi

Mountains run parallel to the Garlock Fault which runs in a northeasterly direction, while the San Emigdio Mountains and Temblor Range parallel the San Andreas Fault. The Principal rivers and streams include Kern River and Poso Creek as shown in **Figure 2**.

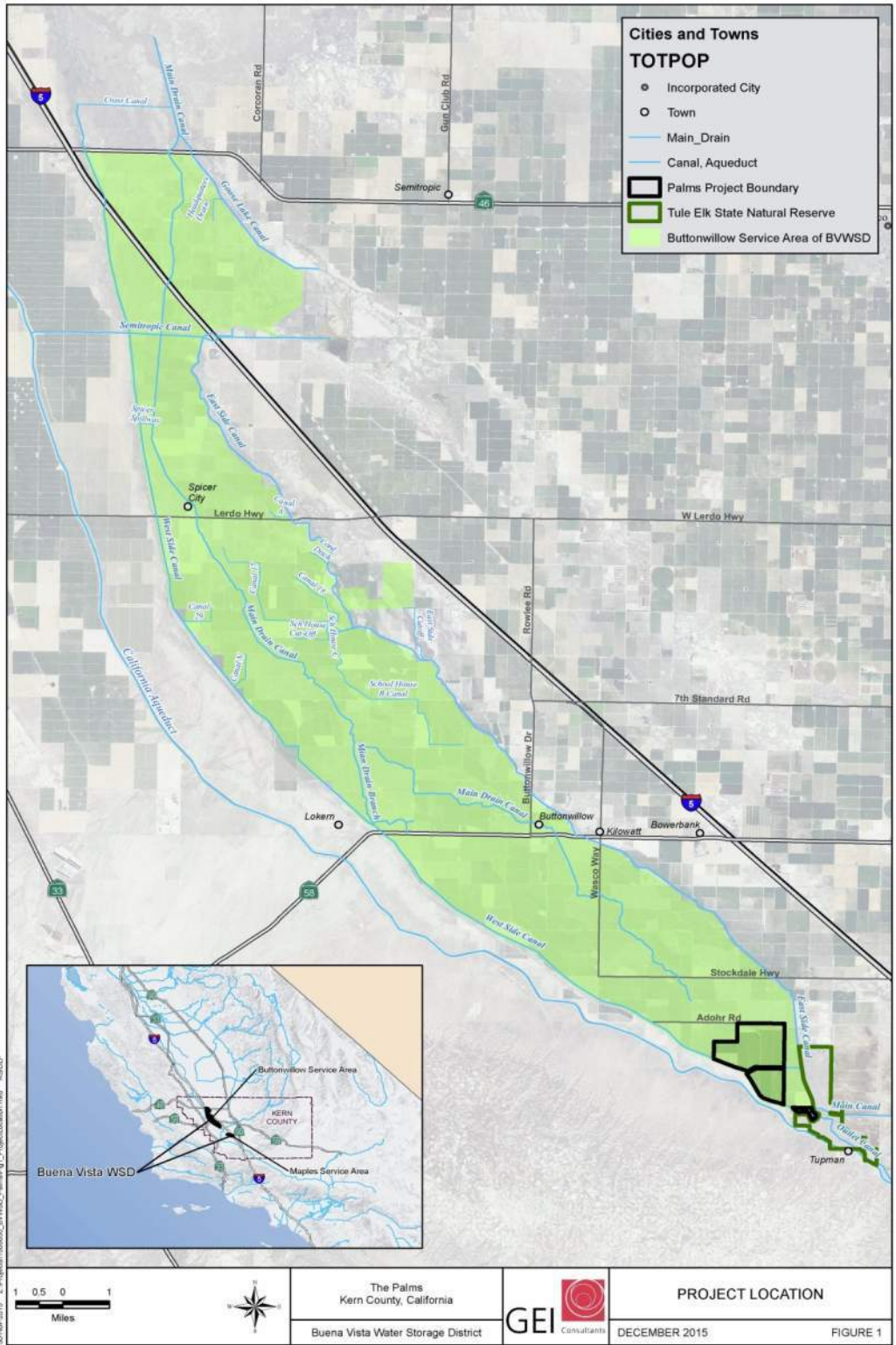
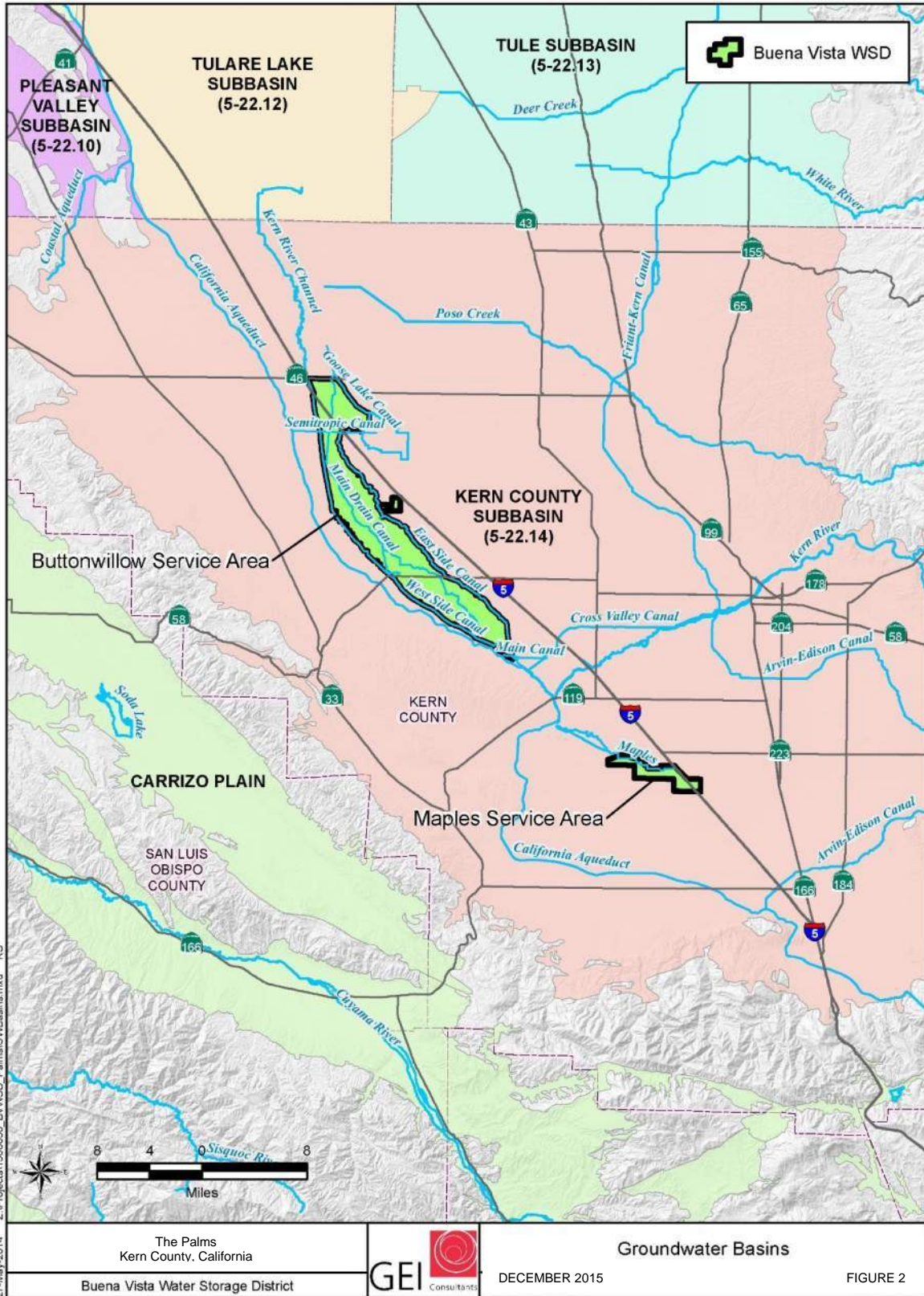


Figure 1: Project Location





Z:\Projects\1506850\_BVWSD\_Palms\GWBasins.mxd RS  
27-May-2014

**Figure 2: Groundwater Subbasins**



## 2 Geologic Conditions

---

The San Joaquin Valley is a structural trough filled to a depth of up to 32,000 feet with marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the valley's structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

### 2.1 Regional Geology

The southern part of the San Joaquin Valley is a broad structural trough of mostly interior drainage. The Sierra Nevada on the east is composed of consolidated igneous and metamorphic rocks of pre-Tertiary age (basement complex). The surface of these rocks slopes 4 to 6 degrees south-westward from the foothills and underlies the valley. The Coast Ranges on the west consist mostly of complexly folded and faulted consolidated marine and non-marine sedimentary rocks of Jurassic, Cretaceous, and Tertiary age, which dip eastward and overlie the basement complex (Croft, 1972). These deposits are considered non-water bearing.

Unconsolidated deposits of Late Pliocene to Holocene age blanket the underlying consolidated rocks in the valley and are the source of most of the fresh groundwater. The unconsolidated deposits are divided into informal stratigraphic units on the basis of source of sediment, environment of deposition, and texture (Croft, 1972).

The unconsolidated sediments that comprise the shallow to intermediate depth water-bearing deposits in the Kern County groundwater subbasin are primarily of continental origin. From youngest to oldest (shallowest to deepest) the informal stratigraphic units consist of flood basin deposits, continental rocks and deposits, and marine rocks and deposits. **Figure 3** shows the regional geology (Page, 1986).

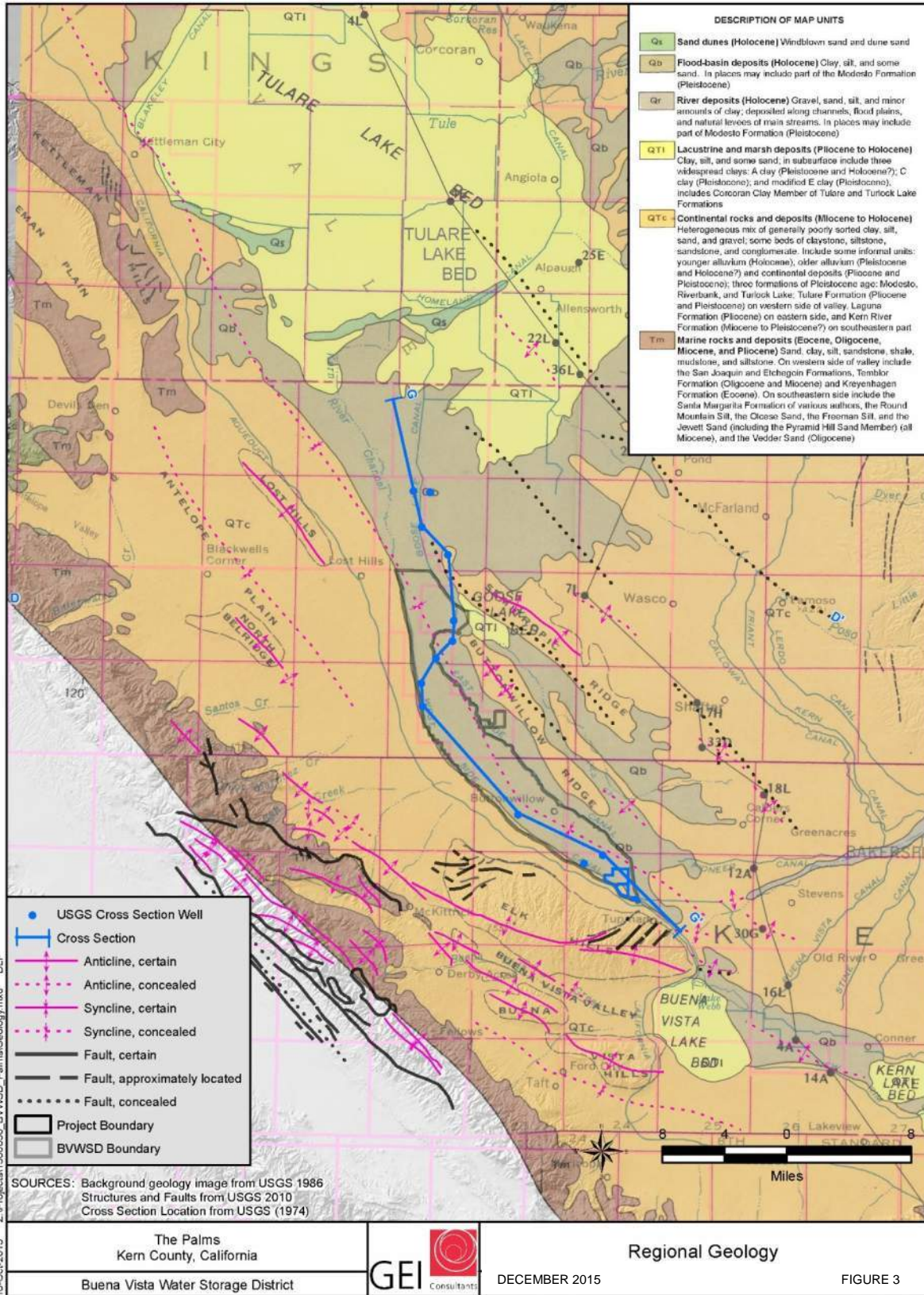


Figure 3: Regional Geology

The continental rocks and flood basin deposits in the San Joaquin Valley groundwater basin contain six distinctly identified clay layers, given letter designations A through F, from shallowest to deepest. All six clay layers are present beneath the center of the former Tulare Lake, and each has a unique lateral extent. The E-clay (also known as the Corcoran Clay) has the greatest lateral extent and has been documented to be present beneath BVWSD. The C-Clay occurs in the northern part of the district but does not extend to the southern part where the Palms Project is located. The A-Clay may also exist in the northern part of the district, causing perched groundwater, but does not extend to the south. The remaining clay layers of the Tulare Lake Formation are not present in the BVWSD area. Figure 4 is a north-south cross-section G-G' that shows the extent of the clay layers beneath BVWSD. (Croft, 1972)

## 2.2 Geologic Structures

The sediments deposited in the Kern County groundwater subbasin were deposited into a large trough that has since been compressed and subsided resulting in the sediments being folded into troughs and ridges, known in geologic terms as synclines and anticlines, respectively. In general, the anticlines are the Bakersfield arch, and the Buttonwillow and Semitropic ridges. The Buttonwillow and Semitropic ridges are surface expressions of two prominent north-south trending anticlines which could potentially be a barrier to groundwater flow to the East. **Figure 3** shows their locations. The intervening topographic troughs are the surface expressions of prominent synclines (Croft and Gordon, 1968). The synclines or troughs typically contain a significantly thicker sequence of young sediments than do the anticlines or broad highs (Pacific, 1991).

Associated with the Buttonwillow and Semitropic anticlines are two concealed faults (CGS, 1991) that dip to the west. The faults are not active and do not extend to ground surface.

There are varying interpretations of the extent of the E-clay in relation to the above described geologic structures. Reports prepared in 1972 and in 1991 show the E-clay to be continuous across the Buttonwillow and Semitropic ridges and their associated anticlines (Croft, 1972; Pacific, 1991). However, work by the United States Geologic Survey (USGS), which was used to prepare the Central Valley Hydrologic Model (CVHM) groundwater flow model, shows the E-clay does not extend across the Buttonwillow and Semitropic ridges and their associated anticlines. **Figure 5** shows the extent and depth of the modified E-clay and the contours of the top of the clay bed. It is possible the anticlines of the Buttonwillow and Semitropic ridges predate the E-clay and therefore the clay was not deposited onto these ridges. If this were the case, sedimentary beds on the east and west sides of the ridges would not be continuous unless they were deposited between the ridges.

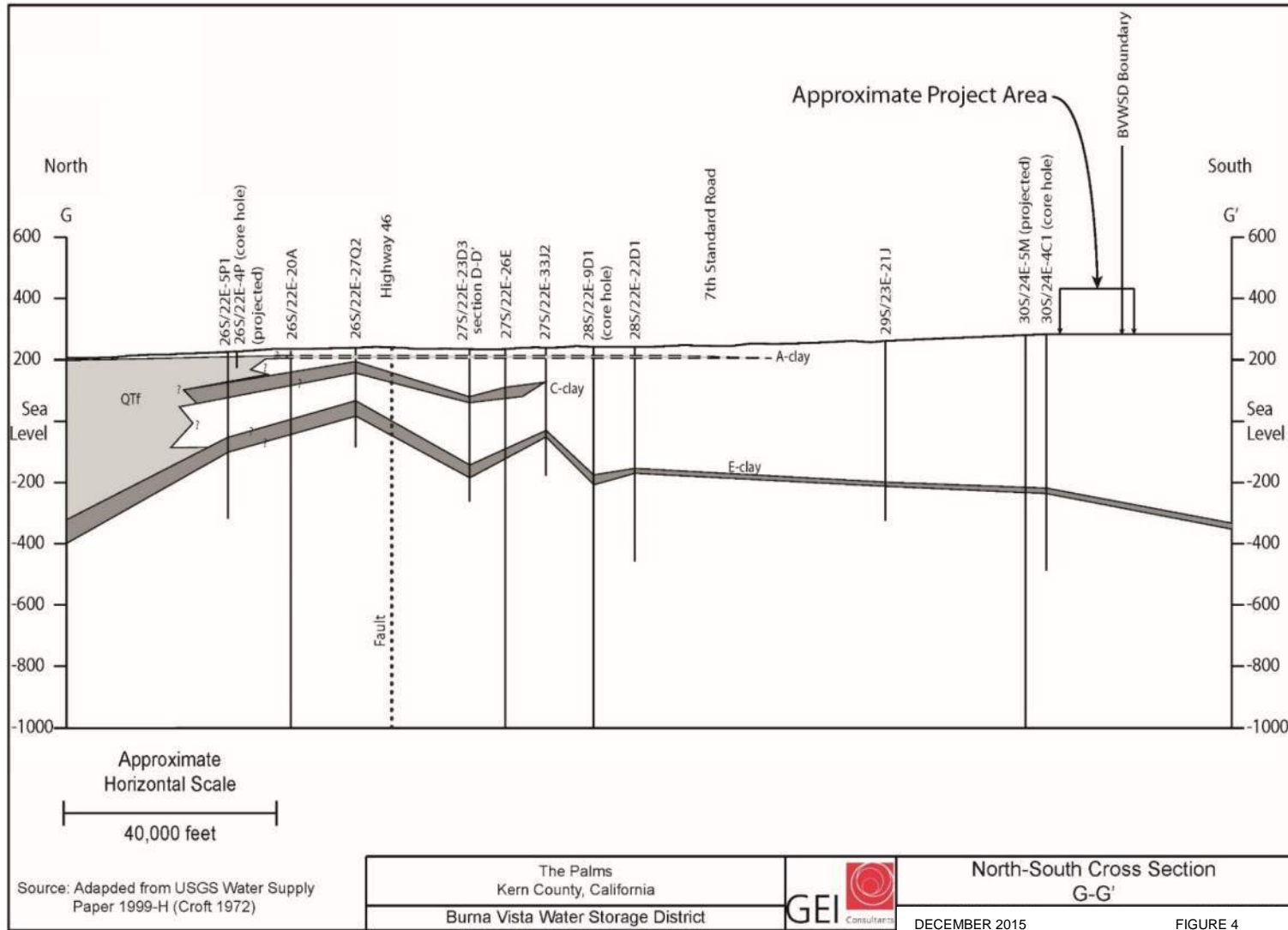
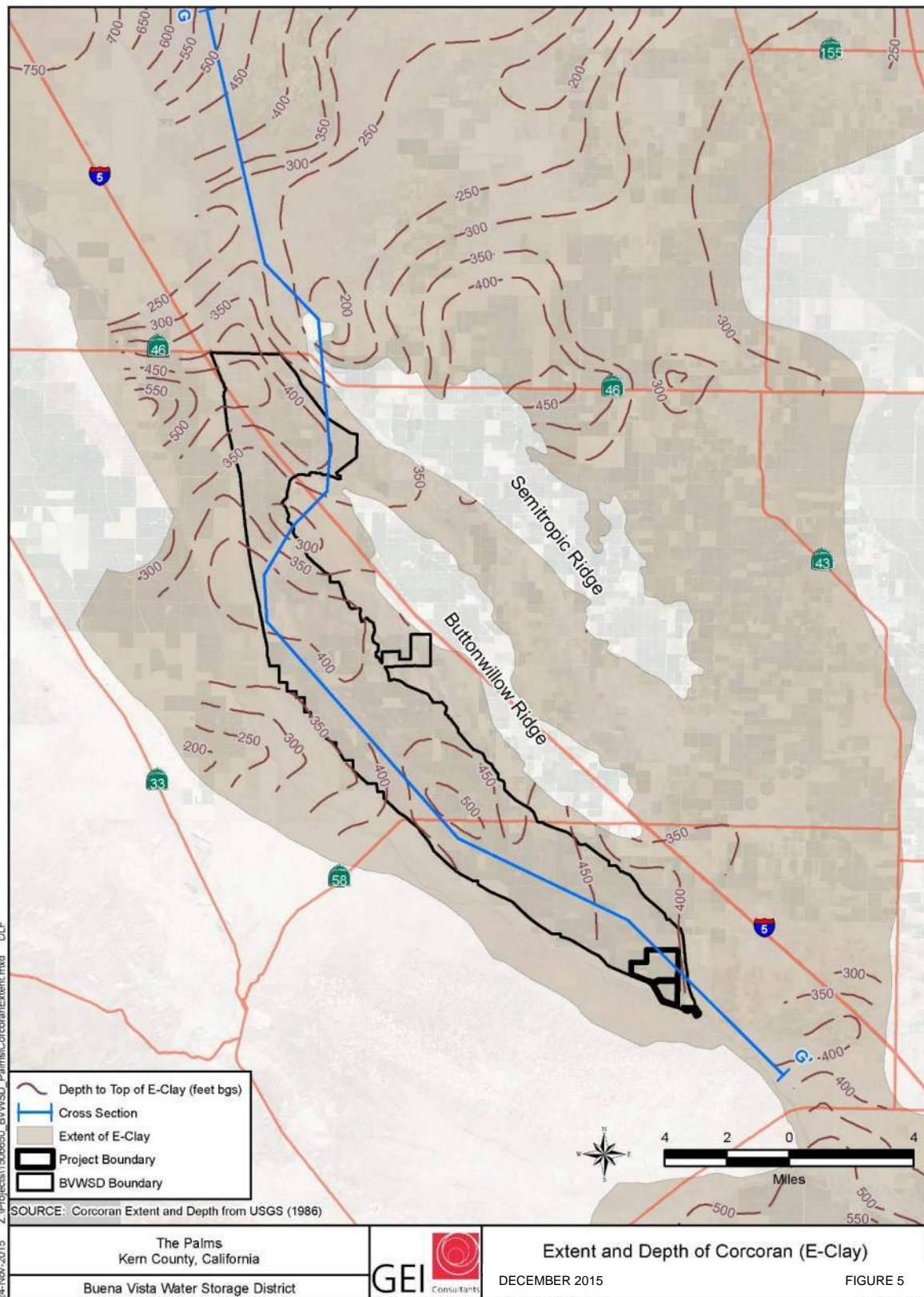


Figure 4: Geologic Cross-Section G-G'





**Figure 5: Extent and Depth of the E-clay**

## 2.3 Local Soils and Geology

The National Resources Conservation Service (NRCS) produces soils maps which indicate the type of surface soils present in the top few feet of the subsurface as part of its SSURGO dataset. One of the soils properties that the NRCS designates is the hydrologic soils group (HSG) which indicates the degree to which water will percolate through the shallow soils. **Figure 6** shows the HSG's for the areas near the Palms Project and indicates that the entire Project area has been designated at HSG C, or having a moderately low seepage potential (moderately high runoff potential). NRCS documentation shows that HSG C soils have a saturated hydraulic conductivity of between 0.14 and 1.42 inches per hour.

Beneath the low permeability surficial soils are sands that transmit water at a higher rate than the overlying soils. **Figure 7** includes sediment logs from two exploratory borings and a well located in the Palms Project area as shown on **Figure 6**. These sands extend to a depth of at least 230 feet. Below 230 feet to a depth of 480 feet there are increasing amounts of silt and clay interbedded with the sand. Below 480 feet is a 50-foot thick clay layer, interpreted to be the modified E-clay, which is a regional confining stratigraphic unit and is assumed to define the base of the main aquifer. Sediments below the E-clay are not typically used as a water source in the area due to high TDS concentrations. Water recharged at the Palms Projects is expected to have greatest impact on groundwater above the E-clay since this low permeability unit extends regionally and continuously throughout the region as shown on **Figure 5**.

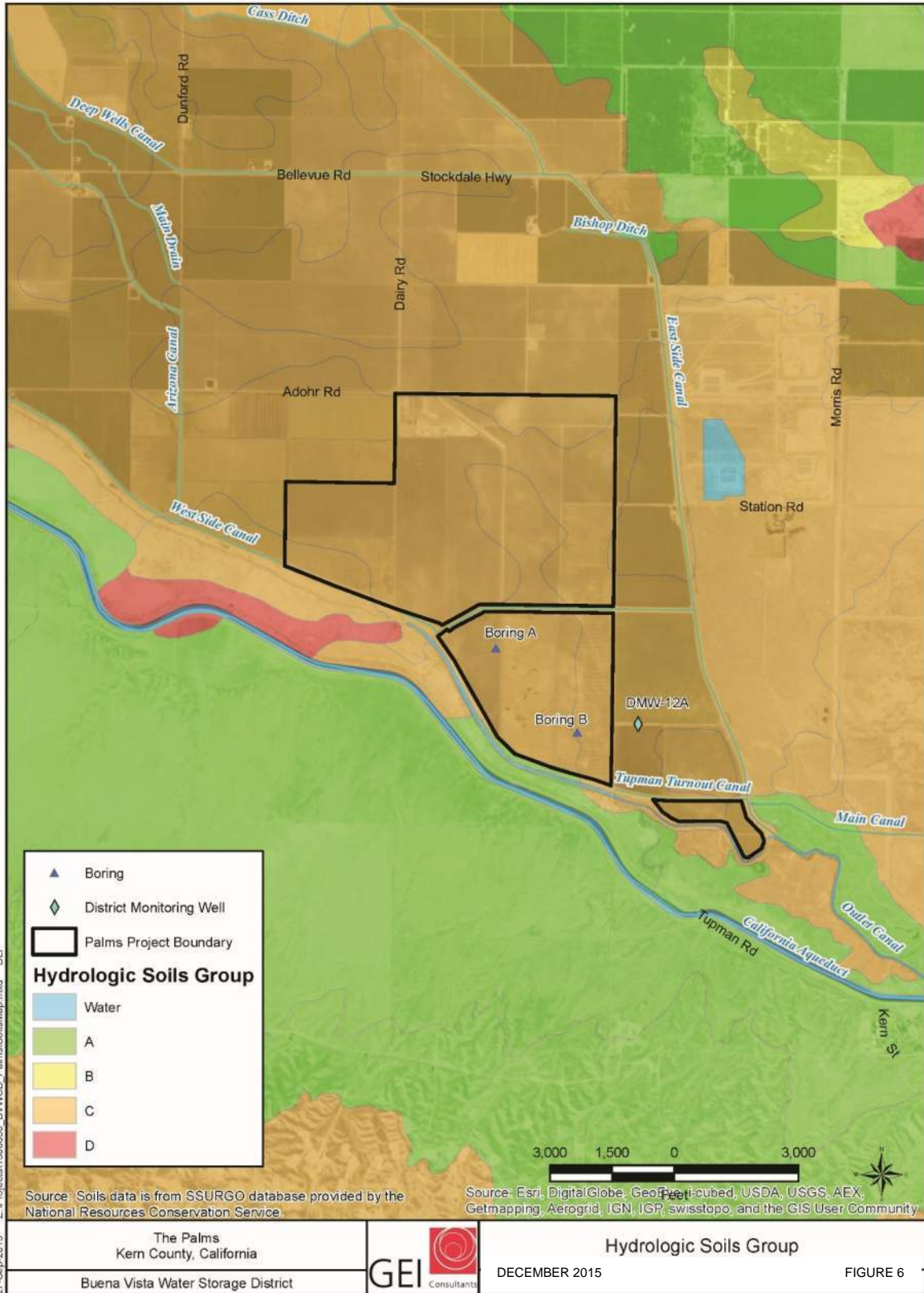
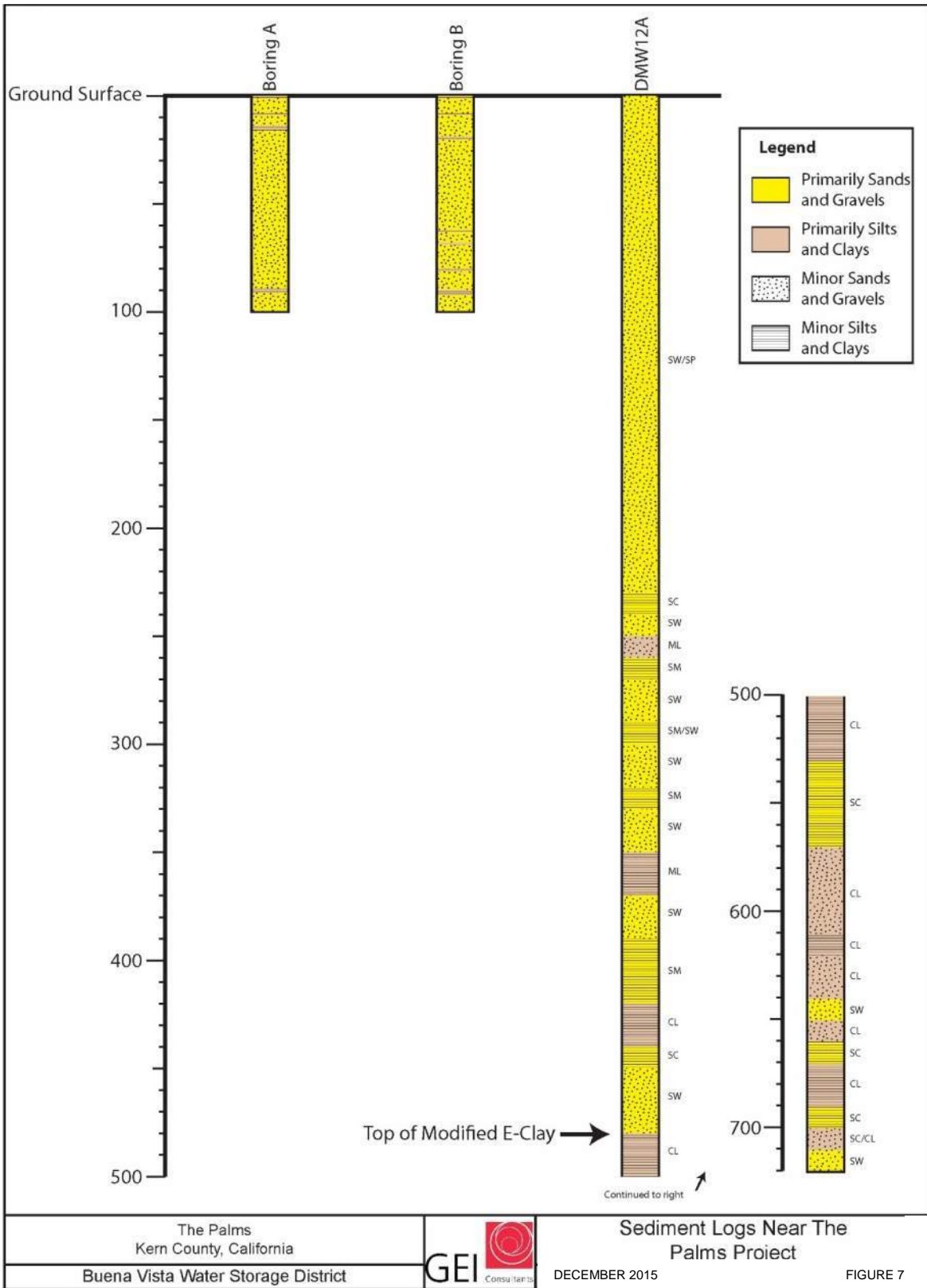


Figure 6: Hydrologic Soils Group



**Figure 7: Sediment Logs near the Palms Project**



## 3 Hydrogeologic Conditions

---

This chapter describes existing hydrogeologic data collected in the vicinity of the Palms Project and provides a summary of aquifer properties that govern the movement of water within the subsurface.

### 3.1 Aquifers

The majority of irrigation wells in the District are completed to depths between 200 and 600 feet with perforated intervals around 150 feet to the bottom (BVWSD, 2014). Wells in the area adjacent to BVWSD are also likely to have been completed in this manner. The main groundwater aquifer under the Palms Project extends from ground surface to the top of the modified E-clay at a depth of about 480 feet. As shown on **Figure 7**, the top portions of the aquifer (about 230 feet below ground surface [bgs]) has primarily clean sand and the lower portion has interbedded sand and silt with some clay.

### 3.2 Confining Beds

The E-clay is known regionally to be a low permeability barrier to vertical groundwater flow, but it is not completely impermeable. The top of the clay layer is about 480 feet bgs under the Palms Project area (Figure 7). Water bearing units below the modified E-clay are typically not used by BVWSD as they contain poor quality water in this part of the basin due to recharge from marine sediments of the Coast Ranges. Regionally, the layer divides the aquifer system into unconfined aquifers above and confined aquifers below. East of the Buttonwillow and Semitropic ridges wells are constructed both above and below the E-clay as the groundwater in this area is typically of better quality. This may suggest that the ridges restrict flow below the E-Clay between BVWSD and areas east of the ridges.

### 3.3 Groundwater Levels

BVWSD has measured groundwater levels in nearby wells between two and four times a year since about 1993. **Figure 8** shows the locations of nearby wells and **Figure 9** shows hydrographs for some of the wells. Depth to groundwater during the period 1993 to 2015 has ranged from 50 to over 220 feet bgs with levels generally declining since 2000.

DMW12A and DMW12B are located next to each other with DMW12A screened below the Modified E-clay and DMW12B screened above. The water levels in these two wells show similar patterns, but the well above the clay shows more dramatic fluctuations than the well below. The similar, but more muted pattern for the lower well may indicate that there is some interconnection between the two aquifers and that the Modified E-clay may transmit water between the two aquifers.

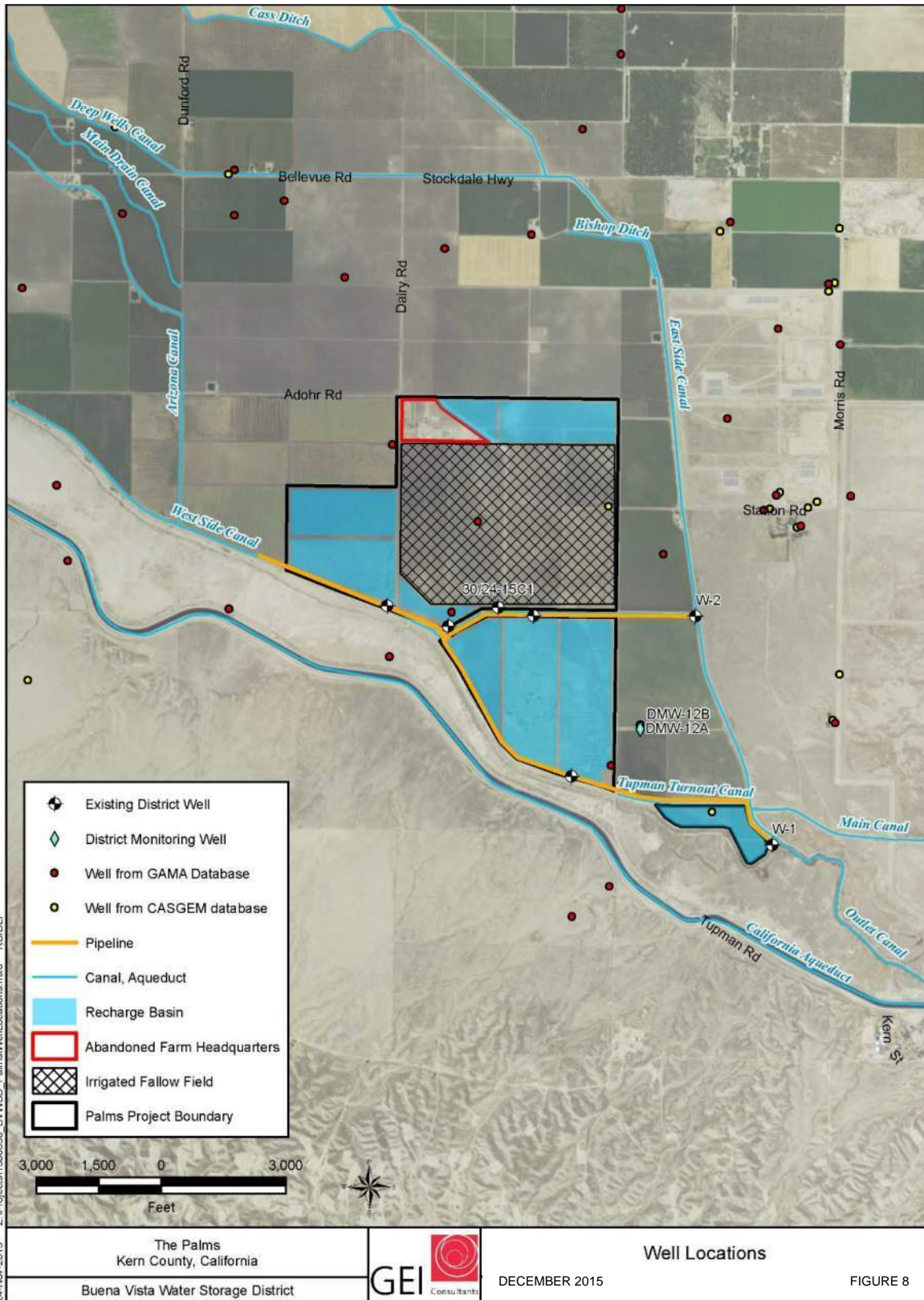
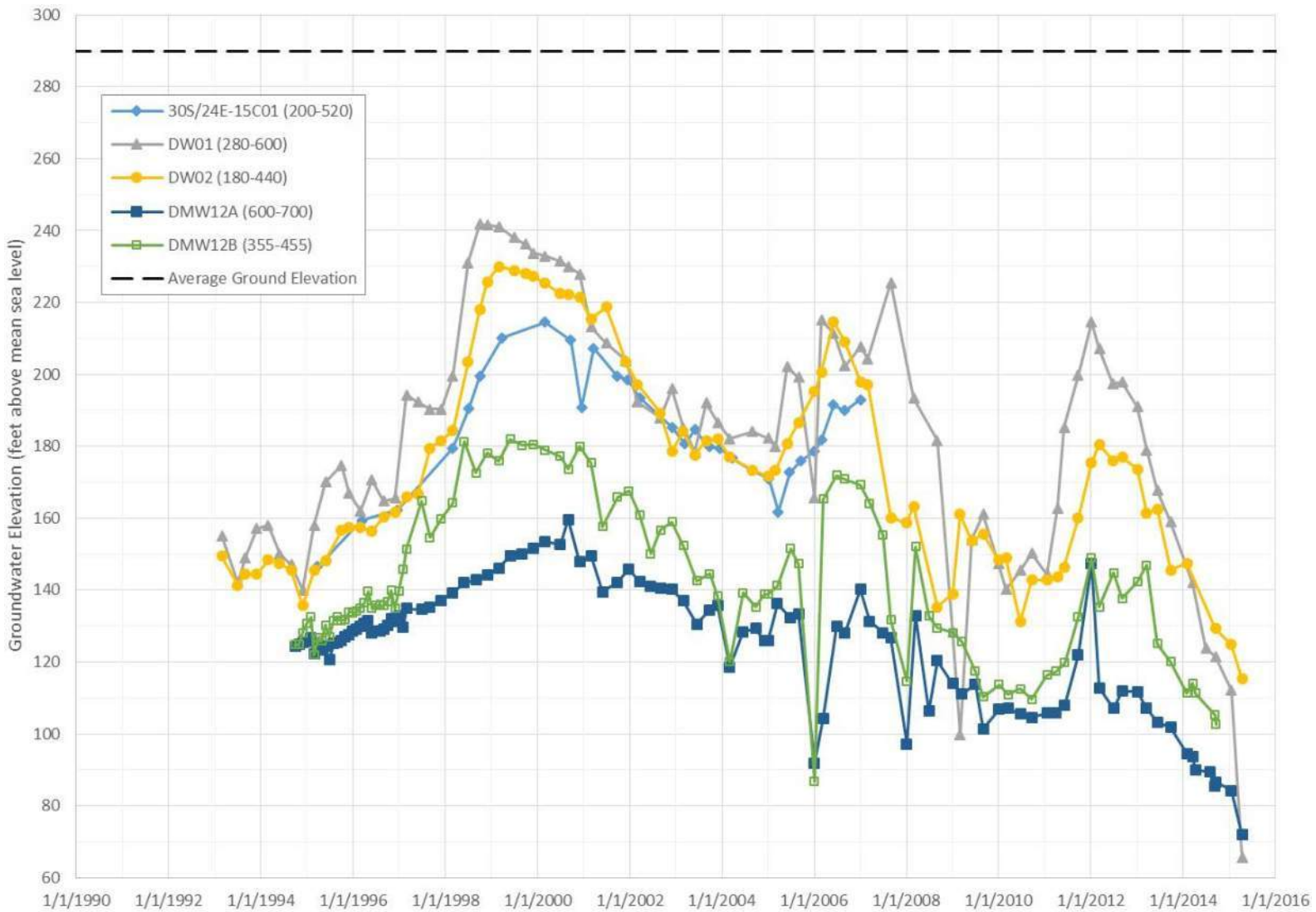


Figure 8: Well Locations near the Palms Project



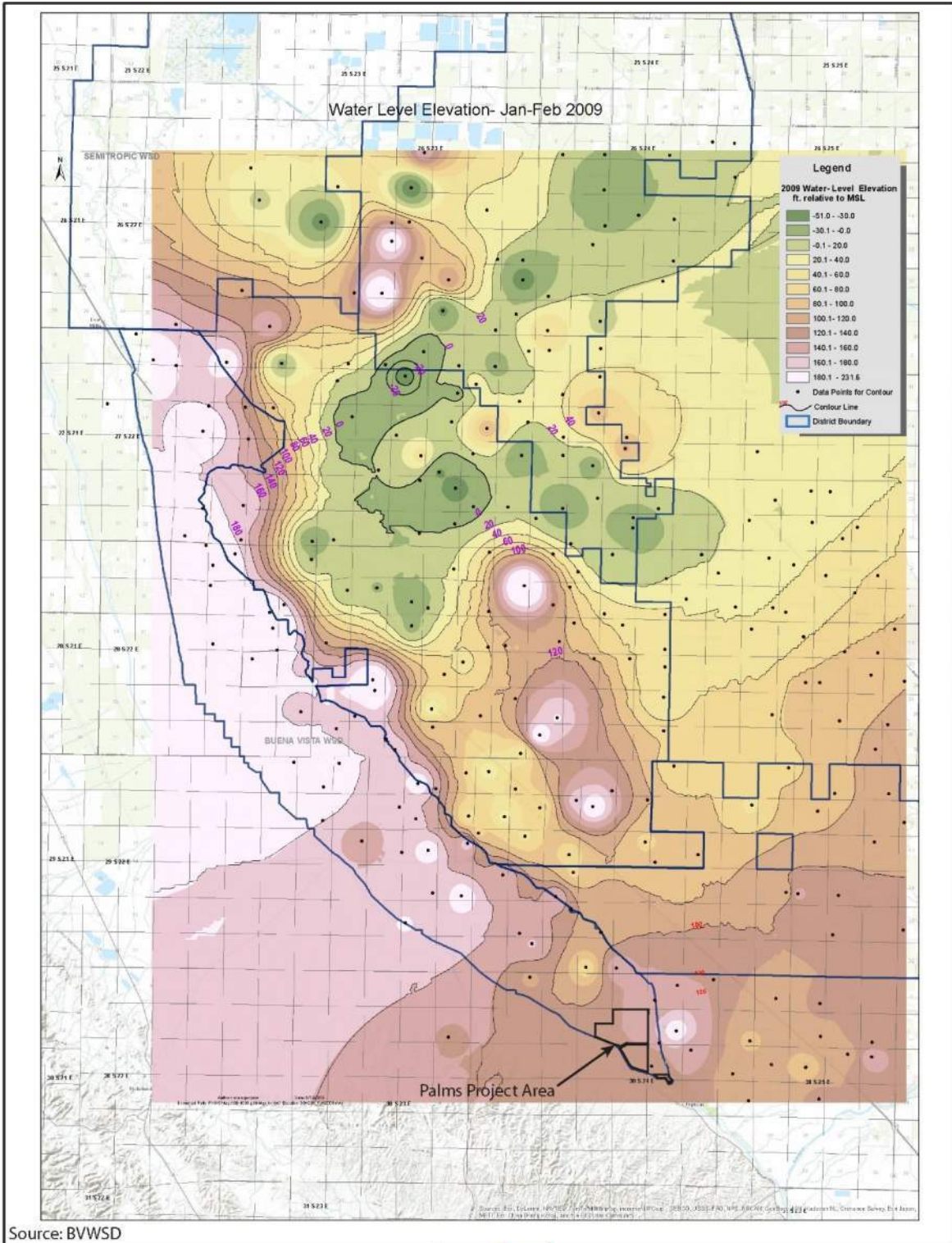
**Figure 9: Groundwater Level Hydrographs of Nearby Wells**

### 3.4 Groundwater Flow Direction

The groundwater flow directions are interpreted from groundwater elevation contours or determined based on three known water level elevations. **Figure 10** shows regional groundwater level contours for 2009 (provided by BVWSD). The groundwater elevations near the Palms Project are lower than areas to the northwest of the project, and this indicates that water generally flows in a southeasterly direction. **Figure 11** shows that locally groundwater contours have a steep gradient east of the project where groundwater levels are greater than 160 feet above msl (feet msl) in the southeast corner of the BSA and drop to below 130 feet msl near the center of the project (Provost and Pritchard, 2013). Local groundwater flow direction near the Palms Project appears to be in a westerly direction and may indicate that the canal east of the project is currently providing recharge to the area. Three nearby wells with good records of groundwater level measurements were analyzed to determine the local flow direction (W-1, W-2, and DMW-12B). The three wells had 44 measurements that were taken simultaneously between 1994 and 2013, and the direction and gradient of the groundwater surface was calculated. **Figure 12** shows the range of flow directions and the average flow direction to the west-southwest. The average gradient was 0.017 ft vertically/ft horizontally.

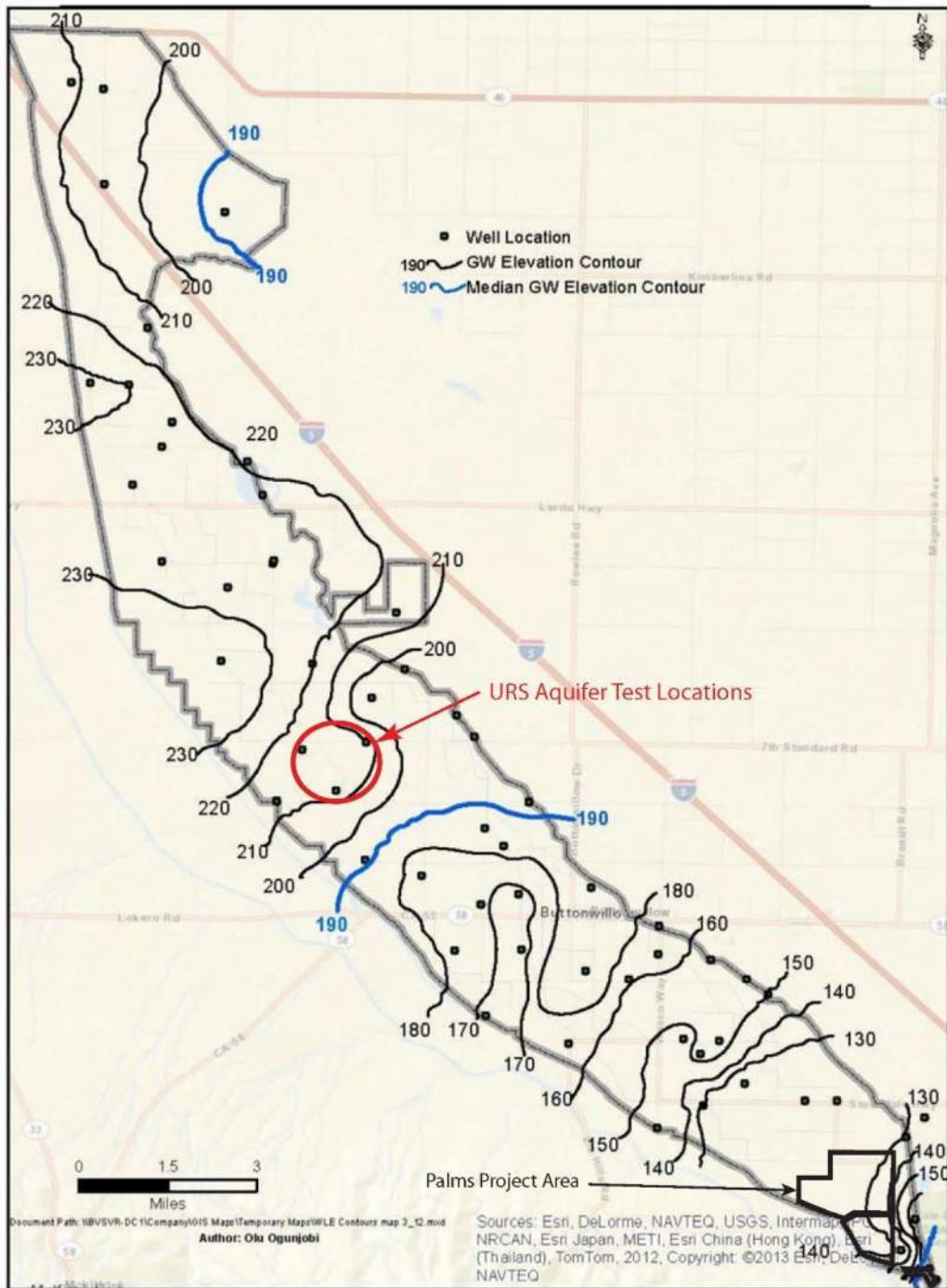
---





The Palms Kern County, California Buena Vista Water Storage District		2009 Regional Groundwater Contours DECEMBER 2015	FIGURE 10
--	--	--	-----------

**Figure 10: Regional Groundwater Elevation Contours - January to February 2009**

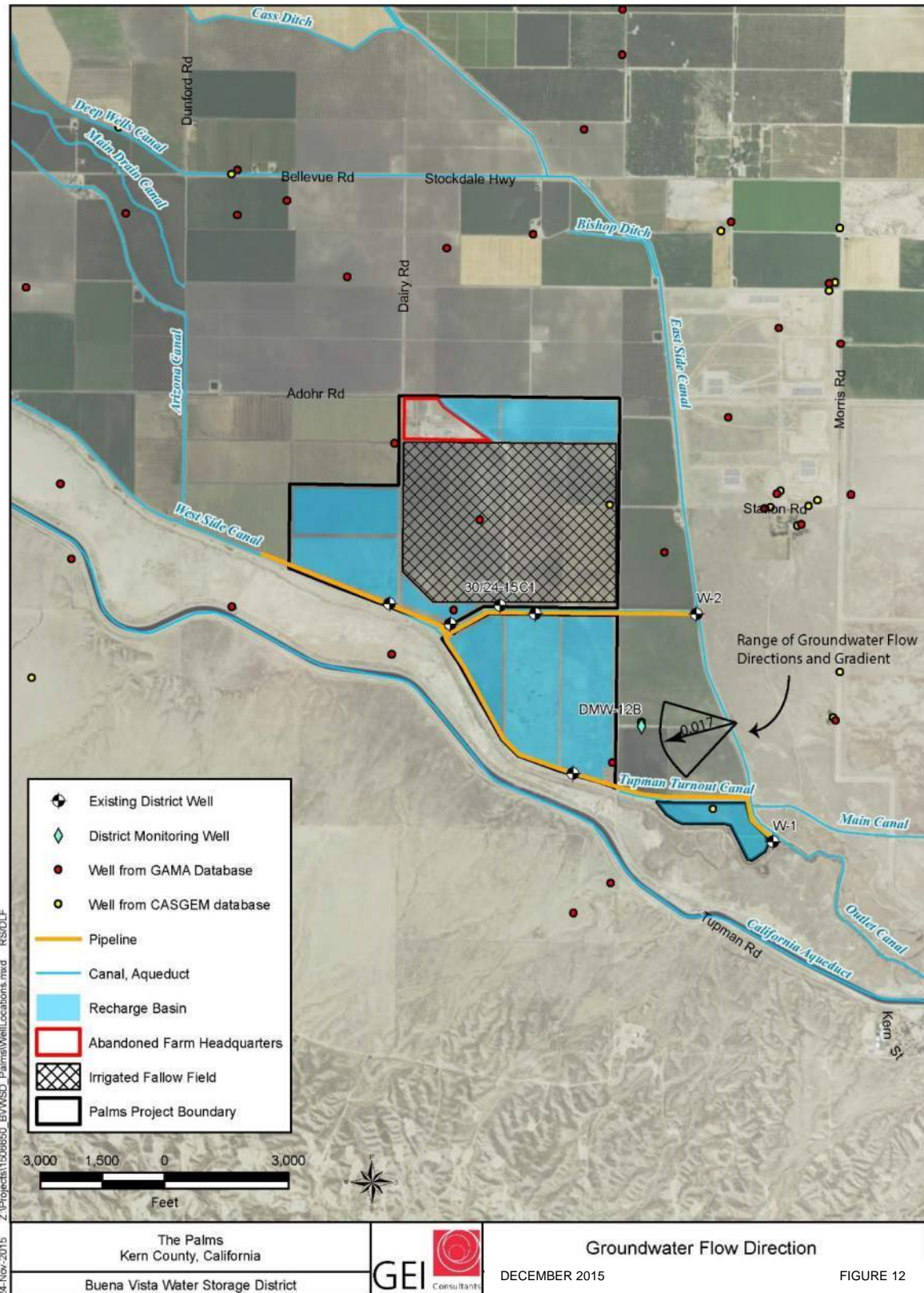


Source: Buena Vista Water Storage District

<p>The Palms Kern County, California</p>		<p>March 2012 Groundwater Elevation Contours</p>
<p>Buena Vista Water Storage District</p>		<p>DECEMBER 2015 <span style="float: right;">FIGURE 11</span></p>

Figure 11: March 2012 Groundwater Elevation Contours





**Figure 12: Groundwater Flow Direction 1994- 2013. The average gradient is 0.017 ft vertically/ft horizontally**

### **3.5 Hydraulic Characteristics**

The aquifer hydraulic characteristics govern the rate that water will recharge and move through the aquifers. Hydraulic characteristics can be estimated based on the type of aquifer material. However, a more reliable method is to perform an aquifer test where a well is pumped and changes in groundwater elevations are measured in the pumping and ideally in other nearby wells. No known aquifer tests have been performed for wells at the Palms Project.

The nearest known tests were performed by URS at three locations shown in **Figure 11**. (URS, 2010) These long-term aquifer tests were performed using one pumping well and one observation well.

Hydraulic Conductivity is an important hydraulic characteristic as it is a measure of how easily water will flow through an aquifer. Hydraulic Conductivity from the accepted URS test was 47 feet/day. Aquifer materials tend to have fewer fines in the southern part of the BSA. The boring shown in **Figure 7** indicates that aquifer material has very few fines, particularly in the upper portions. Aquifer materials are primarily SW/SP based on the boring log. Good aquifers with clean sands can have hydraulic conductivities in the range of 3 to 3000 ft/day (West, 1995). Fine to medium sands indicated by the log will fall in lower end of this range. For the purposes of this study, a hydraulic conductivity of 100 ft/day was used.

The infiltration rate of the recharged water is often estimated as being 10 times less than the horizontal hydraulic conductivity of the aquifer. However, the top few feet of soils are much less permeable and finer as shown by Borings A and B in **Figure 7**. Measures will be taken to remove as much of the fine surface soils as possible, but it is unlikely that all fines will be removed. Fine, suspended sediments will also be introduced to the basin in the recharge water which will tend to clog the pores of the surface soils. Therefore, a lower infiltration rate of 1.5 ft/day has been assumed for this Project.

Specific yield estimates are best determined by aquifer testing with pumping and observation wells. However, none have been made within the Project area. The test made by URS produced a very low value of 0.02, which would indicate the aquifers are confined in this area. Regional specific yield estimates made by the USGS for the San Joaquin Valley have an average specific yield of 0.15. Recent estimates made by the California Energy Commission for the BSA also used 0.15 as the specific yield (URS, 2012). Published values for sandy soils with few fines are around 0.25. (USGS 1967) A specific yield of 0.20 has been assumed for this Project.

### **3.6 Sources of Water for Recharge**

Surface water available to BVWSD for use in the Palms Project may include water from the Kern River, and/or water imported to Kern County through the Friant-Kern Canal or

---



the California Aqueduct. **Figure 13** shows the monthly Kern River flow at Bakersfield for the 26-year period extending from 1990 through 2015. BVWSD holds rights to the use of Kern River water which are commonly referred to as the Second Point Entitlement. While this is the largest source of Kern River water available to the District, the Kern County Water Agency (KCWA) has developed a program to make some of its Lower River Entitlement (or “Hacienda Entitlement”) available to its Basic Contract Member Units, including BVWSD. In this regard, KCWA’s Board of Directors approved a long-term plan at its June 25, 2015 meeting (a copy of which is included in Appendix A). Lower River Entitlement occurs infrequently, in very “wet” years. During the 26-year hydrologic period included in **Figure 13**, Lower River Entitlement occurred in seven years; 1995, 1996, 1997, 1998, 2005, 2006, and 2011.

Another potential source of recharge water for the Palms Project is SWP water, which is imported through the California Aqueduct. BVWSD has a contract with KCWA for the delivery of SWP water. In addition to its contract entitlement, so-called SWP Article 21 water is available from time to time under this contract, typically early in the year when irrigation demands are relatively low. Appendix B shows the timing and amount of Article 21 water delivered to KCWA in “wet” years from 1996 to 2013. Going forward, DWR projects that Article 21 water will become less available. BVWSD has the right to purchase up to its share of this supply (as determined by KCWA), which represents another potential source of water for recharge at the Palms Project.

The Friant-Kern Canal was constructed in the 1950s to import Central Valley Project (CVP) water to Kern County from the CVP’s Friant Division. While BVWSD is not a long-term CVP (Friant) contractor, it is possible to enter into a short-term contract with the U.S. Bureau of Reclamation for the purchase of water in a given year which has historically been referred to as “215 water”. This is water which must be released from Millerton Reservoir and is beyond the demand of the long-term CVP contractors. In addition, floodwater from eastside streams (located to the north of Kern County) has been pumped into the Friant-Kern Canal from time to time. Some of this water has been discharged from the Friant-Kern Canal into the Kern River and this record indicates that the years with the largest discharge generally correspond to the years with Lower River Entitlement, i.e., the locally wettest years generally correspond with the wettest years from the San Joaquin River and south. In this regard, Appendix C includes a copy of a letter from the Kern River Watermaster to the Bureau of Reclamation which addresses the potential for diverting Kaweah River and/or Tule River floodwater into the Friant-Kern Canal during the 2015 and 2016 water year.

---

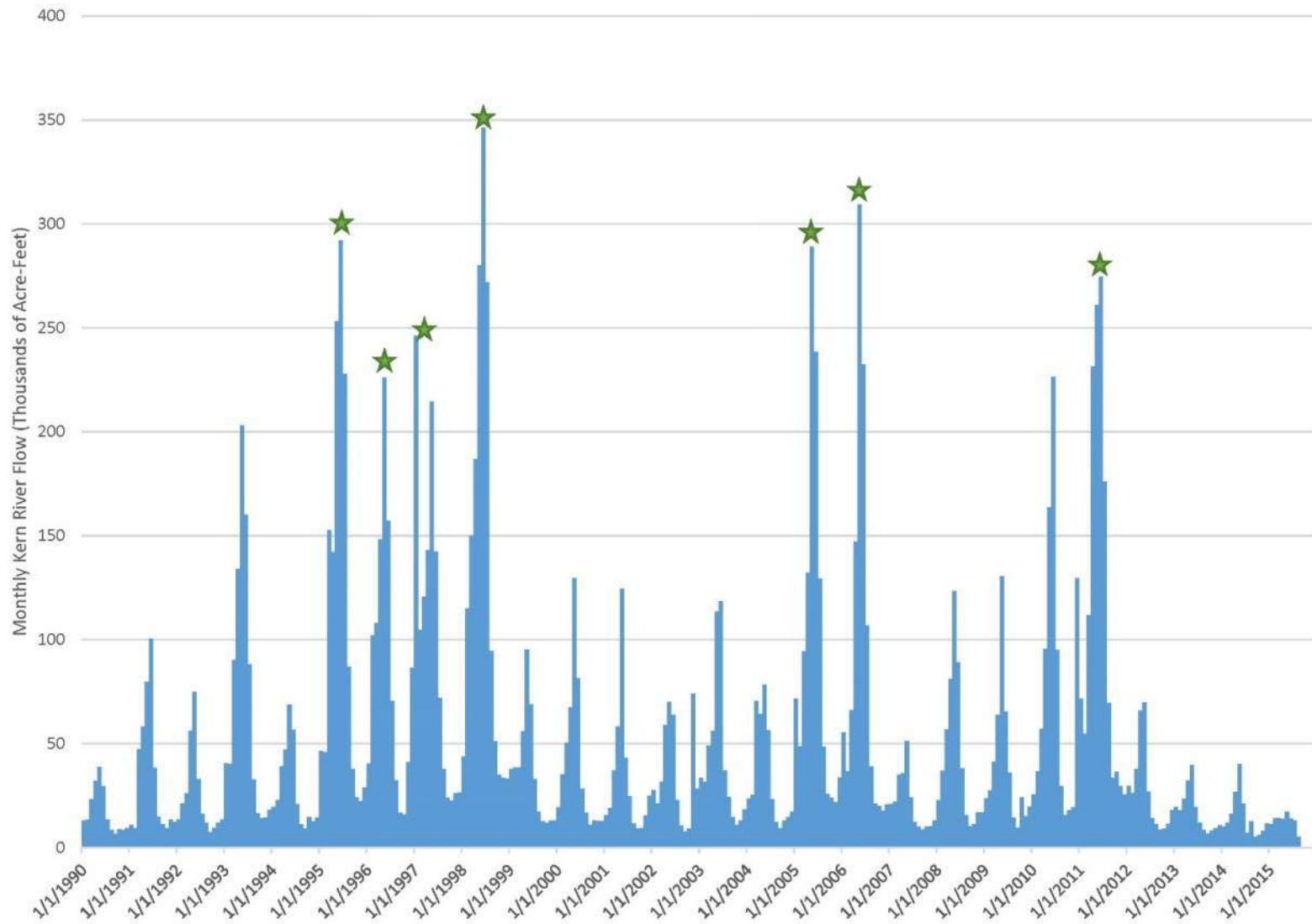


Figure 13: Monthly Kern River Flow at Bakersfield 1990 to 2015

## 4 Water Quality and the Environment

---

This section briefly summarizes native groundwater quality at the proposed project location as well as the quality of surface water that would be used as the source for recharge. In addition to surface and groundwater quality, this section also summarizes the potential threats to soil and groundwater quality resulting from current and past surface land use activities in the vicinity of the project.

### 4.1 Water Quality

#### 4.1.1 Groundwater Quality

**Table 1** summarizes groundwater quality. The table shows the most recent results for each source. DMW12A has total dissolved solids (TDS), chloride, and Specific Conductance concentrations above the mcl, but this well is screened below the Modified E-clay where poor quality water is recharged as the result of runoff from the Coast Range Mountains. Water quality in groundwater above the Modified E-clay is generally good with all constituents below the drinking water maximum contaminant level (mcl).

#### 4.1.2 Source Water for Recharge

**Table 1** also summarizes water quality for the potential surface water sources waters to be used for recharge. The table shows the most recent results for each source. Water quality in the source water is generally better quality than groundwater, with all constituents below the drinking water maximum contaminant level (mcl).

### 4.2 Environmental Records Search

Environmental data records were reviewed to determine potential sources of pollution to groundwater in the Palms Project area. Data were obtained from three sources. A records report was obtained from EDR<sup>®</sup>, the GeoTracker database was searched, and reports from the HECA power project were reviewed.

The EDR<sup>®</sup> report contained public records searches for historic land uses and known contamination sites. The report contained the records searches, aerial photos, and maps of the area and indicated that the property was not listed in any of the databases, except for a “Naval Petroleum Reserve” located south of the project. Reserve land status does not necessarily indicate that development of the petroleum reserve has occurred. The report did document an oil and gas well on the property that was reportedly abandoned in the 1950’s and no evidence of the well remains. The full EDR report is included as **Appendix D**.

The GeoTracker database is maintained by the California State Water Resources Control Board (SWRCB) and is useful in locating regulated facilities and cleanup sites. **Figure 14** shows a map of all regulated sites near the Palms Project and indicates that the nearest sites are located near I-5, almost 2.5 miles from the site.

The HECA Project is a proposed power generation facility located on a large portion of the same lands as the Palms Project. An Application for Certification (AFC) was submitted, and as part of the AFC, a Phase I Environmental Site Assessment (ESA) was performed and is included in **Appendix E**. The Phase I ESA reported several potential sources of contamination to groundwater. Five underground storage tanks (USTs) which held diesel and gasoline fuels, an air strip for crop dusters where stained soils were observed, several above ground storage tanks (ASTs), and storage of agricultural chemicals. Most of these facilities are shown in **Figure 2 of Appendix E**. The remainder are shown in **Appendix F**.

The Phase I ESA was followed up by a Phase II Environmental assessment, included in Appendix F. This Phase II ESA shows additional detail of the site and locations of potential contaminating activities which are shown in **Figure 3** of Appendix F. Most of the facilities that could have a potential for contamination of soils and groundwater are located near the “Farm Operations Area” (FOA). This area is not intended to be used to recharge groundwater.

The Phase II ESA did not include groundwater quality analyses, but did include soil samples of the shallow subsurface (up to 15 feet) where the stained soils were located along with 44 other locations throughout the property, shown in **Figures 4 and 5 of Appendix F**. TPH - Mineral Oil was detected at four sites near the FOA, and the pesticides dieldrin, endrin, and endosulfan were detected at seven sites located both at the FOA and along the drainage ditch the runs south from the FOA.

The ESA uses three screening levels for comparison of results: the California Human Health Screening Levels (CHHSL), the US EPA Region 9 Regional Screening Levels (RSL), and the San Francisco Bay Regional Water Quality Control Board Environmental Screening Level (SFBRWQCB ESL). It should be noted that the SFBRWQCB ESLs are guidance values and are not established by policy or regulation. Exceedance of the ESL “does not necessarily indicate adverse effects on human health or the environment, rather that additional evaluation is warranted”. (SFBRWQCB, 2013) These ESLs are many orders of magnitude lower than the other two regulatory-based screening levels. **Table 2** shows the highest exceedance in comparison to the three types of screening levels and indicates that the ESLs are exceeded for TPH and pesticides but the maximum concentrations are significantly lower than other state or federal screening levels (CHHSLs or RSLs). Arsenic is a naturally occurring constituent in soils in this area and soil concentrations are above all screening levels.

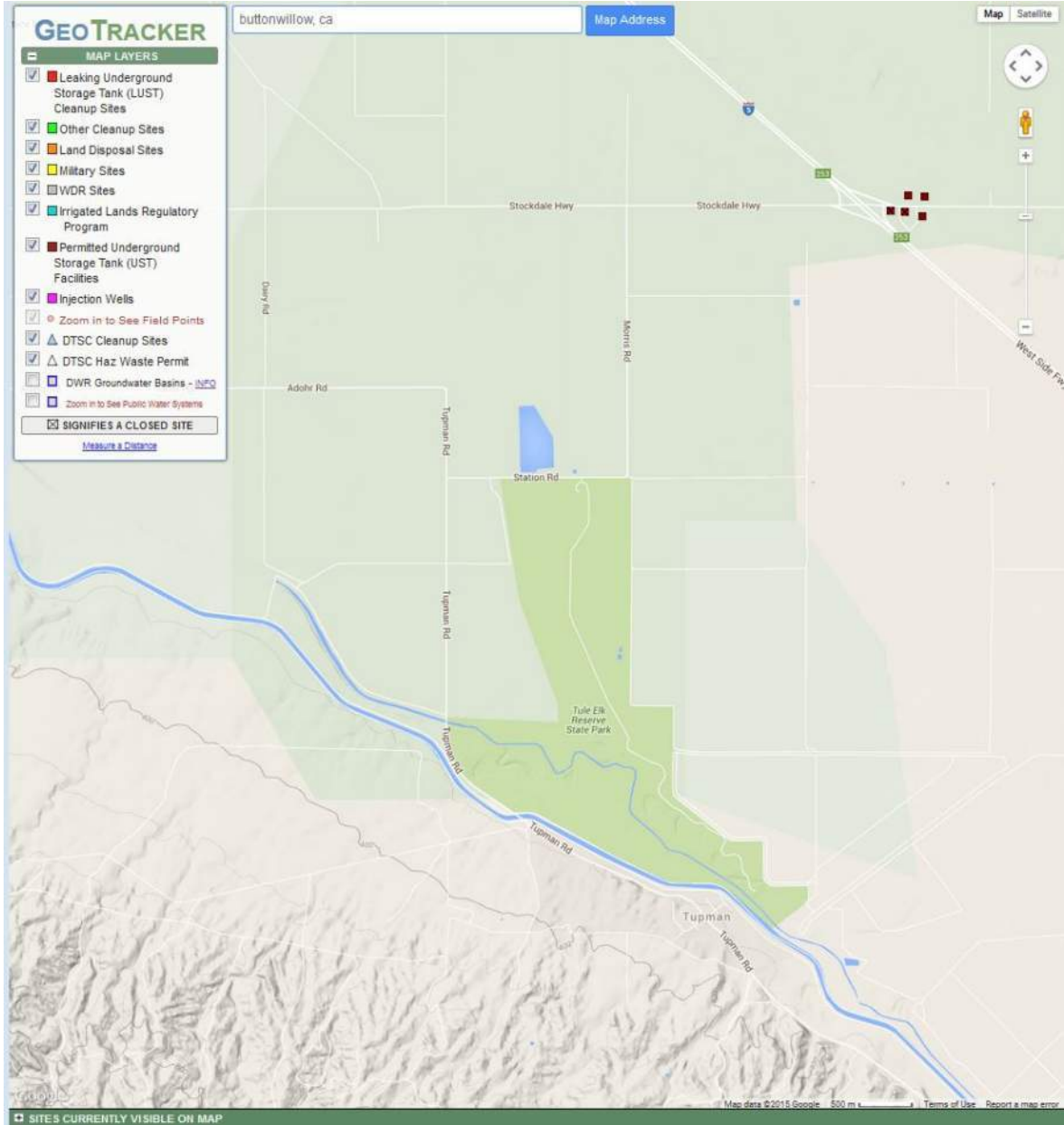


Figure 14: GeoTracker Sites

**Table 1: Recent Water Quality Summary**

Constituent	Alkalinity	Aluminum	Arsenic	Bicarbonate	Boron	Calcium	Carbonate	Chloride	Chromium (Total)	Chromium (Hexavalent)	Color	Fluoride (natural)	Hardness	Iron	Magnesium	Manganese	Nitrate (as NO3)	pH, Laboratory	Potassium	Sodium	Specific Conductance	Sulfate	Total Dissolved Solids	Turbidity	Zinc			
	md	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	uS/cm	mg/L	mg/L	Units	ug/L			
Source	Analysis Year																											
Source Water (Surface Water)	Analysis Year																											
	86	0.114	ND	105	0.15	35.9	ND	29.2	0.0014	0.0007	< 2.5	0.16	97.8	ND	1.99	ND	8.83	8.33	1.15	25.8	328	26.8	196	0.46	ND			
	80	0.113	2.2	97.6	0.2	26.2	ND	89.1	ND	ND	12.5	ND	121	ND	13.4	ND	2.75	8.48	2.97	60.4	551	50.9	284	1.16	ND			
	63	0.262	3.4	76.9	0.13	16	ND	5.04	ND	ND	20	0.22	51.4	0.19	2.77	0.0323	ND	7.92	1.76	14.3	171	13.9	104	3.09	ND			
Receiving Water (Groundwater)	Screen Depth																											
	Well	(feet)	Sample Date																									
	DMW12A	600-700	7/7/2015	35		16	42		200	0	1100				0.58	540		9.5		0	7.15	2.9	530	3550	170			13
	DMW12B	355-455	7/24/2013	60		0.67	55		16	8.9	63				0.014	43		0.53			9.09	0.95	110	585	140	390		
	DW01	120-511	7/2/2014	36			36	0.32	77	0	41				0.37			18		0	6.8	2.3	60	860	340	630		
DW02	460	6/30/2014	160		0	160	0.25	97	0	50				0			7		2.7	7.9	0	60	780	170	530			

Blank indicates no chemical analysis was available.

Yellow highlighting indicates a value above the state drinking water MCL.

ND indicates constituent was not detected.

Surface water data source is Improvement District 4.

Groundwater data source is BVWSD

\* Value identified as MCL is Notification Level or Advisory Level for constituent lacking MCL.

Note: Surface water was also tested by ID4 for additional constituents regulated for drinking water standards. All other constituents were ND, including Regulated Volatile Organic Chemicals and Regulated Non-Volatile Synthetic Organic Chemicals

**Table 2: Maximum Measured Concentrations and Screening Levels for Constituents with Exceedances (mg/kg of soil)**

	TPH 8015 FF			Organochlorine Pesticides 8081			Metals
	Diesel	Motor Oil	Mineral Oil	Dieldrin	Endo-sulfan II	Endrin	Arsenic
Max Concentration from Phase II ESA	23	20000	93000	0.0036	0.0048	0.014	35
California Human Health Screening Level	NS	NS	NS	0.13	NS	230	0.24
US EPA region 9 Regional Screening Level	NS	NS	310000	0.11	26000	180	1.6
SFBWQCB ESL	83	1000	1000	0.0023	0.0046	0.00065	5.5

NS = No standard established

## 5 Assessment of Project Effects

---

### 5.1 Approach

The proposed project will affect groundwater levels and groundwater quality during recharge operations. Our approach to evaluating changes in groundwater levels included use of a groundwater mounding tool to estimate a reasonable range of changes in groundwater levels given a range of basin sizes expected in the project, estimated infiltration rate, aquifer properties and depth to groundwater (supported by well and geotechnical information available for the site and detailed in **Section 5**). Our approach to evaluating changes in groundwater quality is to qualitatively compare surface and groundwater quality to forecast long term changes in groundwater quality likely to result from the mixing with surface water from the Kern River watershed and California Aqueduct.

### 5.2 Project Effects on Groundwater Levels

**Figure 15** and **Figure 9** show that depth to groundwater in the vicinity of the Palms Project is currently between 160 and 180 feet below ground surface (bgs). Before the current drought, levels were higher at between 120 and 140 feet bgs. For purposes of this analysis an average, uniform groundwater level of 150 feet bgs was assumed for mounding analyses. The mounding analysis was performed using a tool developed by the USGS (2010) which uses the Hantush analytical equation for groundwater flow. The analysis assumes a square recharge basin and doesn't consider groundwater flow based on partially saturated sediments.

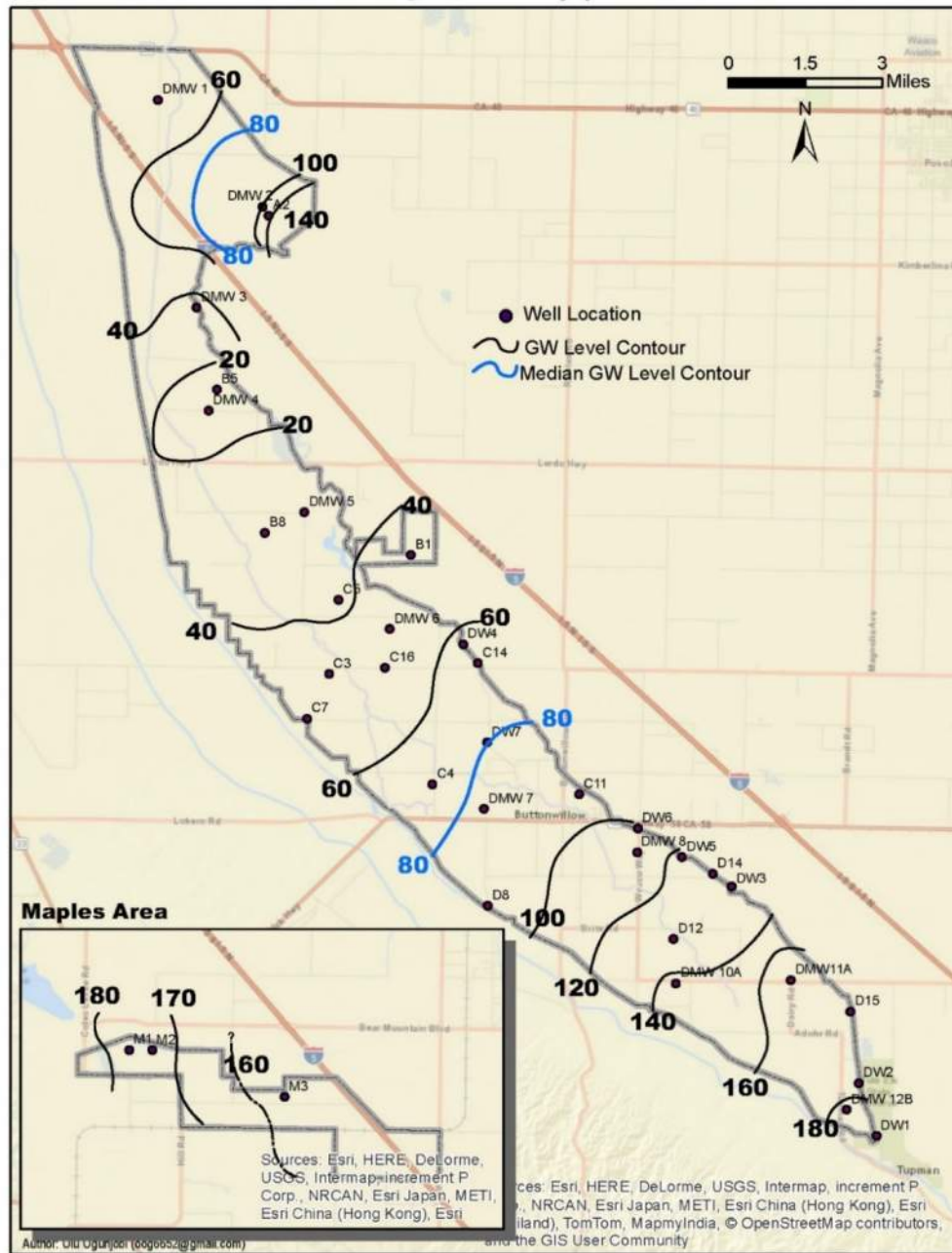
The results of the mound analysis indicate that the proposed project will have the beneficial impact of locally raising groundwater levels in the vicinity of the groundwater recharge basins resulting in lower energy costs to lift water from wells in the area.

**Figure 16** shows a reasonable range of anticipated groundwater level rise based on a variety of basin sizes and a continuous fixed recharge duration of 120 days. The figure indicates that the project could raise groundwater levels by 39 to 150 feet (ground surface) in the center of the basin, and that levels could rise 1 to about 10 feet at a distance of 2.5 miles.

It is anticipated the Palm recharge project would be built in phases. Mounding results shown on **Figure 16** includes various sizes of recharge facility, including the "build out" facility size of 1,100 acres. Empirical information on actual mound height and width will be measured during operation of the initial project facility. This information will be used in the design of subsequent project phases.



**Groundwater Level Contour Map-Jan 2015 (ft)**



BUENA VISTA COALITION  
 DEPTH TO GROUNDWATER, CONTOUR MAP

**Figure 15: Depth to Groundwater Map**

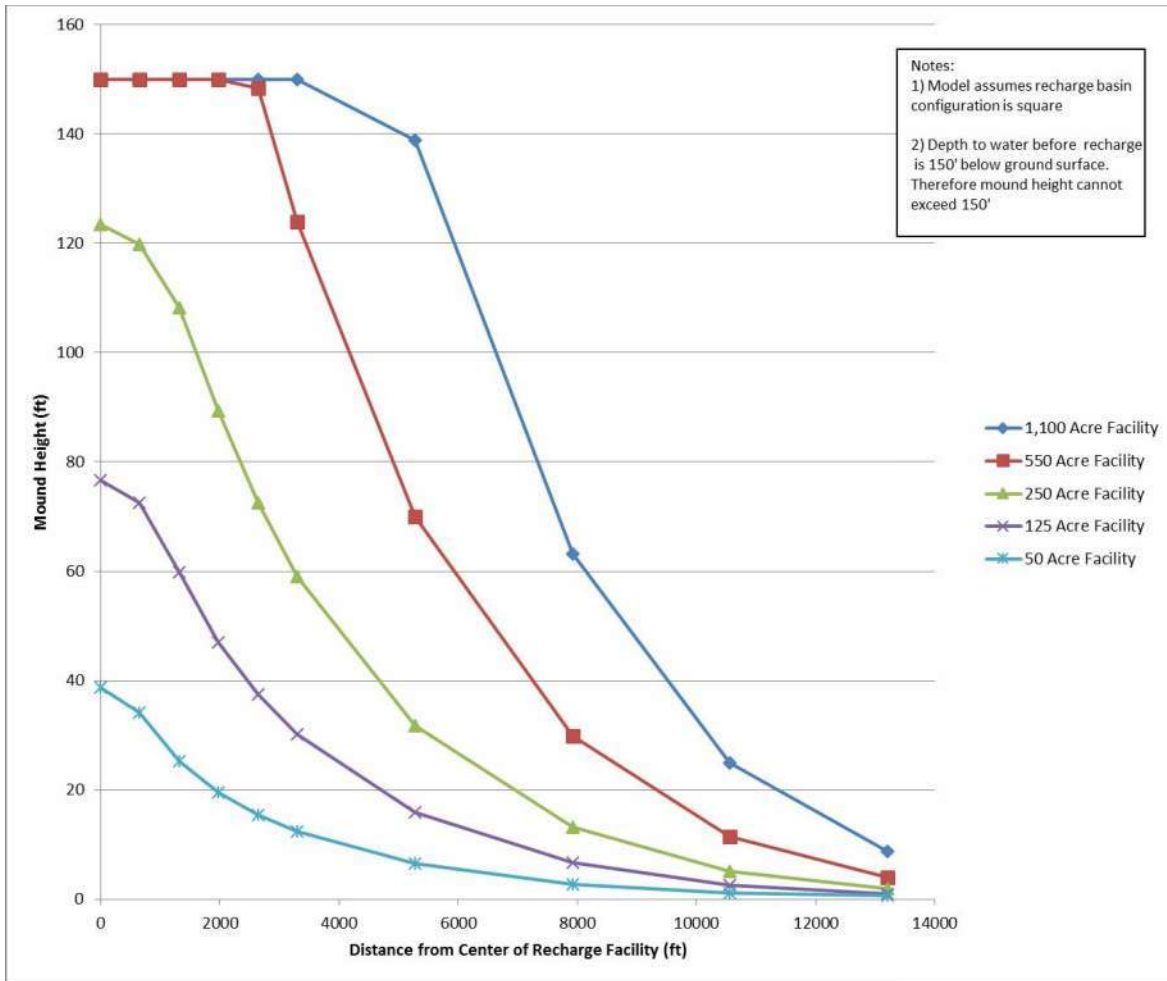


Figure 16: Predicted Recharge Mound Height

### 5.3 Project Effects on Groundwater Quality

Section 4.1 of this report summarizes groundwater quality as well as the quality of surface water used for replenishment at the Palms Project. The recharge of surface water with groundwater through recharge operations will result in a blended water quality. The actual aquifer water quality resulting from the mixing of surface and groundwater will depend on the volume of water recharged, the duration of recharge and the distance away from the project. No adverse geochemical reactions are predicted based on the mixing of surface and groundwater quality at the Palms Project. Because both surface water sources have lower levels of dissolved solids, trace minerals and major ions, the blended mix that results from recharge will result in lower levels of total dissolved solids, major ions and trace minerals in the mixing zone within the aquifer.

Section 4.2 explains that the Phase II ESA conducted for the HECA project, encountered soils impacted by fuel and farm chemicals resulting from previous land uses in the northern area of the Palms Recharge Facility. If these chemicals are still present in soils at

this project site, then surface water recharge through these soils could cause migration of these chemicals into the groundwater aquifer. It is unknown if these chemicals are already present in the groundwater. The most likely areas of impact are near the Farm Operations Area (FOA) and near the drainage ditch that runs south from the FOA where chemicals may have been transported if there was a spill. **Section 5.3.1** explains how this risk will be mitigated.

### **5.3.1 Mitigation to Reduce Risk to Groundwater Quality Impacts**

The potential threat to groundwater quality resulting from the potential migration of fuel and farm chemicals from soil into groundwater will be mitigated as follows:

GW 1 – Groundwater monitoring wells will be constructed on site before recharge operations begin. Groundwater samples will be collected from each of these wells before recharge operations begin. The purpose of this monitoring is to verify that shallow and deep groundwater beneath the site is free of priority pollutants before initiating recharge activities.

GW 2 – During construction of the recharge basins, approximately 5 feet of fine ground soils (silts and clays) will be excavated from each recharge basin to expose the underlying fine to medium grained sand in the base of each recharge basin. During soil excavation and removal the contractor and inspecting engineer will monitor for evidence of soil contamination (color, odor, buried tanks, pipelines). If contaminated soils are encountered during excavation, these soils will be analyzed to identify the type and extent (vertically and horizontally) of contamination present. Contaminated soils will either be treated on site or disposed of at a hazardous waste landfill.

GW 3 – If contaminated soils are encountered during construction, additional groundwater monitoring wells may be installed to verify that groundwater has not been impacted. As an added measure of protection, BVWSD will cease the construction of recharge basins in and adjacent to contaminated soils. During the operational phase of the Palms project, BVWSD will conduct annual monitoring to verify that groundwater quality is not being adversely impacted by the recharge operation.

## **5.4 Summary of Project Impacts**

The analysis documented in this report indicates that groundwater levels and groundwater quality will be affected by Palms Recharge Project. In both cases, the changes to groundwater levels and groundwater quality are beneficial to existing and potential users of the groundwater resource. Groundwater levels will rise and total dissolved solid levels will drop in response to recharge. The absolute amount of changes depends on the volume and duration of recharge. Due to the regionally extensive nature of the E-clay as described

in **Section 2.2**, the recharge benefits described above pertain to wells screened above the E-clay, but will provide the benefit of reduced risk that poor quality water could migrate vertically from below the E-clay. The only potentially negative impact to groundwater quality would be the migration of pollutants (if present) from soil into the groundwater system during recharge. To mitigate for this condition, BVWSD will establish a baseline water quality at the site through sampling of groundwater monitoring wells. BVWSD will also monitor for the presence of contaminated soils during construction of the recharge basins. If contamination is detected, these areas will not be used for recharge basins.

## 6 References

---

- Buena Vista Water Storage District (BVWSD). 2014. Agricultural Water Management Plan.
- California Department of Water Resources (DWR). 2003. California's Groundwater. Bulletin 118 – Update 2003.
- California Geologic Survey (CGS), 1991. California Geologic Data Map Series – Map No. 2 – Geologic Map of California.
- Croft, M.G. and Gordon, G.V. 1968. Geology, Hydrology, and Quality of Water in the Hanford-Visalia Area, San Joaquin Valley, California. USGS Open-File Report 68-67.
- Croft. 1972. Subsurface Geology of the Late Tertiary and Quaternary Water-bearing Deposits of the Southern Part of the San Joaquin Valley, California. Geological Water-Supply Paper 1999-H.
- Pacific Geotechnical Associates. 1991. Study of the Regional Geologic Structure related to Ground Water Aquifers in the Southern San Joaquin Valley Groundwater Basin, Kern County, California (Phase 1A and Phase 1B).
- Page R. W. 1986. Geology of the Fresh Ground-Water Basin of the Central Valley, California with Texture Maps and Sections. Professional Paper 1401-C.
- Provost and Pritchard. 2013. Groundwater Management Plan, Buena Vista Water Storage District (DRAFT).
- San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), 2013. User's Guide: Derivation and Application of Environmental Screening Levels. Interim Final 2013. Available at:  
[http://www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/esl.shtml](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml)
- URS, 2012. Amended Application for Certification for Hydrogen Energy California (HECA), 08-AFC-8, Kern County California. May 2012. Available at:  
[http://www.energy.ca.gov/sitingcases/hydrogen\\_energy/documents/applicant/amended\\_afc/](http://www.energy.ca.gov/sitingcases/hydrogen_energy/documents/applicant/amended_afc/)
- URS March, 2010. Hydrogeologic Data Acquisition Report, Groundwater Monitoring and Process-Water Well-Field Development Project.

United States Geological Survey (USGS), 1967. Specific yield — compilation of specific yields for various materials. By Johnson, A.I., U.S. Geological Survey Water Supply Paper 1662-D. 74 p.

United States Geological Survey (USGS), 2010. Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins. USGS Scientific Investigations Report 2010–5102 by Glen B. Carleton.

West, T.R., 1995. Geology applied to engineering. Prentice Hall, 560 pp.

# **Appendix A – Lower Kern River Rights and Obligations**

---

---

TO: Water Resources Committee  
Agenda Item No. 8

FROM: Holly Melton

DATE: September 24, 2015

SUBJECT: Authorization to Offer a Long-Term Plan for a Portion of the Kern County Water Agency's Lower Kern River Rights and Obligations to the Basic Contract Member Units

**Issue:**

Consider authorizing the General Manager to Execute the Contract for a Portion of Kern County Water Agency Kern River Lower River Rights and Obligations.

**Recommended Motion:**

Adopt Resolution No. 32-15 authorizing the General Manager to Execute the Contract for a Portion of Kern County Water Agency Kern River Lower River Rights and Obligations.

**Discussion:**

In 2001, the Kern County Water Agency (Agency) acquired the Lower Kern River (Lower River) water rights from the Nickel Family, LLC. In July 2014, Agency staff and the Kern River/Lower River Rights Issues ad hoc committee (President Page, Director Radon and Director Milobar) began with working a team of Member Unit representatives (Scott Hamilton, Mark Mulkey and Phil Nixon) to develop a long-term plan for the allocation of Lower River water benefits and obligations. At the June 25, 2015 Agency Board of Directors (Board) meeting, the Agency Board approved offering a long-term plan for a portion of the Agency's Lower River water rights and obligations to the Basic Contract Member Units (Member Units) with the following provisions:

1. Member Units, excluding Improvement District No. 4 (ID4), shall receive annual Lower River yield between 40,001 and 125,000 acre-feet (af), as determined by the Agency after meeting the Agency's current year obligations and targeted storage amounts needed to meet future year obligations;
2. Member Units, including ID4, shall receive annual Lower River yield above 125,000 af;
3. Member Units may receive Isabella Reservoir storage within the year Lower River yield as received, subject to the Agency's needs;
4. Lower River yield and charges shall be allocated among participating Member Units on Table A Amounts;
5. Member Units shall pay an administrative charge of \$0.50 per af;
6. Member Units shall pay an annual banked water repayment charge of \$0.16 per af;
7. Member Units shall pay \$5 per af for each af of Lower River water delivered;
8. Lower River water received must be used within the Agency's service area; and
9. 10-year term, renewable for an additional 10 years, subject to mutually agreeable terms and conditions.



Following the June 25, 2015 Agency Board meeting, the Kern River/Lower River Rights Issues ad hoc committee met with the Member Unit representatives. Pursuant to this meeting, Provision No. 9 of the offer was changed as follows:

9. 10-year term, renewable for additional 10-year terms, subject to mutually agreeable terms and conditions.

All of the Member Units accepted the offer with this revised provision.

In order to maximize Lower River water made available to the Member Units while minimizing Member Units' costs, the Agency is contributing the following to the long-term plan:

1. Dedicating \$750,000 of monies within the Lower River Fund;
2. Offering 45,718 af of the Agency's previously banked groundwater stored in the Kern Fan banking projects to the Member Units at \$50 per af and financed over 20 years with 2 percent interest to meet future Nickel obligations;
3. Dedicating 35,460 af of the Agency's previously banked Lower River water stored in the Kern Fan banking projects to meet future Nickel obligations;
4. Using a portion of the Agency's Pioneer Project recharge and recovery capacity to meet the annual Nickel obligation;
5. After 2017, using the Agency's State Water Project water supplies to meet the annual obligation to Western Hills Water District;
6. Continuing to meet all obligations of the Contract to Transfer the Kern River Lower River Water; and
7. Continuing to represent and defend the Lower River water rights, including funding all legal expenses.

Agency staff and the ad hoc committee have drafted the Contract for a Portion of Kern County Water Agency Kern River Lower River Rights and Obligations (Contract), and recommend the Contract be distributed to the Member Units for execution.

# **Appendix B – State Water Project Delivery of Article 21 Water**

---

---

**Historical Article 21 Deliveries and Carryover Spill**  
**Data Source: DWR SWP Delivery Finalization Report Spreadsheets**

ALLOCATION %																		
Article 21 Deliveries	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>FEATHER RIVER</b>																		
COUNTY OF BUTTE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLUMAS COUNTY FC&WCD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CITY OF YUBA CITY	-	-	-	-	-	-	-	-	-	-	1,194	-	-	-	-	-	-	-
<b>Subtotal</b>	-	-	-	-	-	-	-	-	-	-	<b>1,194</b>	-	-	-	-	-	-	-
<b>NORTH BAY</b>																		
NAPA COUNTY FC&WCD	-	-	-	754	297	996	827	376	1,450	606	300	3,597	1,219	1,588	2,207	-	-	-
SOLANO COUNTY WA	-	-	9,982	-	1,040	2,304	2,242	2,280	7,787	10,421	18,195	8,217	1,510	4,444	5,298	15,000	1,027	510
<b>Subtotal</b>	-	-	<b>9,982</b>	<b>754</b>	<b>1,337</b>	<b>3,300</b>	<b>3,069</b>	<b>2,656</b>	<b>9,237</b>	<b>11,027</b>	<b>18,495</b>	<b>11,814</b>	<b>2,729</b>	<b>6,032</b>	<b>7,505</b>	<b>15,000</b>	<b>1,027</b>	<b>510</b>
<b>SOUTH BAY</b>																		
ALAMEDA COUNTY FC&WCD-ZONE 7	-	-	-	2,910	3,740	-	1,484	-	-	-	-	912	-	-	-	-	-	-
ALAMEDA COUNTY WD	-	-	-	2,781	2,380	10	83	-	-	846	1,922	550	-	-	-	1,959	-	-
SANTA CLARA VALLEY WD	-	-	-	15,480	18,381	-	202	936	2,983	6,298	26,769	4,840	-	-	-	970	-	-
<b>Subtotal</b>	-	-	-	<b>21,171</b>	<b>24,501</b>	<b>10</b>	<b>1,769</b>	<b>936</b>	<b>2,983</b>	<b>7,144</b>	<b>28,691</b>	<b>6,302</b>	-	-	-	<b>2,929</b>	-	-
<b>SAN JOAQUIN VALLEY</b>																		
OAK FLAT WATER DISTRICT	-	-	-	-	-	-	50	19	-	-	-	41	-	-	-	-	-	-
COUNTY OF KINGS	-	-	12	-	-	-	-	58	3,157	11,504	366	474	-	-	-	552	-	-
DEVIL'S DEN WATER DISTRICT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUDLEY RIDGE WATER DISTRICT	4,457	7,141	984	4,990	7,454	933	1,861	1,928	7,393	28,197	18,429	8,953	-	-	-	11,666	-	-
EMPIRE WEST SIDE ID	-	-	-	176	528	253	26	175	626	1,799	1,124	1,172	-	-	-	138	-	-
HACIENDA WATER DISTRICT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KERN COUNTY WA	15,653	10,264	-	58,241	78,908	23,233	21,951	27,891	86,513	453,078	247,914	99,861	-	-	-	194,119	-	-
TULARE LAKE BASIN WSD	8,537	1,213	9,310	49,898	56,818	8,755	3,749	6,243	15,299	47,267	58,059	12,902	-	-	-	6,909	-	-
<b>Subtotal</b>	<b>28,647</b>	<b>18,618</b>	<b>10,306</b>	<b>113,305</b>	<b>143,708</b>	<b>33,174</b>	<b>27,637</b>	<b>36,314</b>	<b>112,988</b>	<b>541,845</b>	<b>325,892</b>	<b>123,403</b>	-	-	-	<b>213,384</b>	-	-
<b>CENTRAL COASTAL</b>																		
SAN LUIS OBISPO COUNTY FC&WCD	-	-	-	-	-	-	-	36	69	245	827	24	-	-	-	-	-	-
SANTA BARBARA COUNTY FC&WCD	-	-	-	-	-	396	436	339	-	-	4,020	1,070	-	-	-	-	-	-
<b>Subtotal</b>	-	-	-	-	-	<b>396</b>	<b>436</b>	<b>375</b>	<b>69</b>	<b>245</b>	<b>4,847</b>	<b>1,094</b>	-	-	-	-	-	-
<b>SOUTHERN CALIFORNIA</b>																		
ANTELOPE VALLEY-EAST KERN WA	-	641	-	-	-	-	-	-	-	-	-	-	-	-	-	7,629	-	-
CASTAIC LAKE WA	-	-	-	-	-	850	280	991	1,618	2,451	2,089	-	-	-	-	400	-	-
COACHELLA VALLEY WD	-	-	-	-	17,820	-	111	204	-	-	-	-	-	-	-	-	-	-
CRESTLINE-LAKE ARROWHEAD WA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DESERT WATER AGENCY	-	-	-	-	17,820	-	189	330	-	-	-	-	-	-	-	-	-	-
LITTLEROCK CREEK ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
THE METROPOLITAN WATER DISTRICT OF	-	-	-	22,840	103,124	10,415	9,624	17,622	91,601	168,300	238,478	166,517	-	-	-	181,610	-	-
MOJAVE WATER AGENCY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PALMDALE WATER DISTRICT	-	-	-	-	-	-	-	-	-	-	1,653	843	-	-	-	-	-	-
SAN BERNARDINO VALLEY MWD	-	-	-	-	-	-	-	200	-	56	-	-	-	-	-	-	-	-
SAN GABRIEL VALLEY MWD	-	2,173	-	-	475	-	-	200	-	-	-	-	-	-	-	-	-	-
SAN GORGONIO PASS WA	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-
VENTURA COUNTY WPD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Subtotal</b>	-	<b>2,814</b>	-	<b>22,840</b>	<b>139,239</b>	<b>11,265</b>	<b>10,204</b>	<b>19,547</b>	<b>93,219</b>	<b>170,822</b>	<b>242,220</b>	<b>167,360</b>	-	-	-	<b>189,639</b>	-	-
<b>TOTAL</b>	<b>28,647</b>	<b>21,432</b>	<b>20,288</b>	<b>158,070</b>	<b>308,785</b>	<b>48,145</b>	<b>43,115</b>	<b>59,828</b>	<b>218,496</b>	<b>731,083</b>	<b>621,339</b>	<b>309,973</b>	<b>2,729</b>	<b>6,032</b>	<b>7,505</b>	<b>420,952</b>	<b>1,027</b>	<b>510</b>
<b>KCWA % of Total Art 21 Deliv.</b>	55%	48%		37%	26%	48%	51%	47%	40%	62%	40%	32%				46%		<b>44%</b>

AVG

**Carryover Spill**

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>FEATHER RIVER</b>																		
COUNTY OF BUTTE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PLUMAS COUNTY FC&WCD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CITY OF YUBA CITY	-	-	-	-	12,765	-	-	-	-	-	12,789	1,332	-	-	-	8,996	-	-
<b>Subtotal</b>	-	-	-	-	<b>12,765</b>	-	-	-	-	-	<b>12,789</b>	<b>1,332</b>	-	-	-	<b>8,996</b>	-	-
<b>NORTH BAY</b>																		
NAPA COUNTY FC&WCD	-	-	-	-	23,339	-	-	-	-	7,426	43,058	10,277	-	-	-	8,895	-	-
SOLANO COUNTY WA	-	-	-	-	22,362	-	-	397	397	12,611	51,274	21,831	-	-	-	22,329	-	-
<b>Subtotal</b>	-	-	-	-	<b>45,701</b>	-	-	<b>397</b>	<b>27,388</b>	<b>20,037</b>	<b>94,332</b>	<b>32,108</b>	-	-	-	<b>31,224</b>	-	-
<b>SOUTH BAY</b>																		
ALAMEDA COUNTY FC&WCD-ZONE 7	-	-	-	-	59,461	-	-	-	-	5,658	66,433	22,940	-	-	-	7,340	-	-
ALAMEDA COUNTY WD	-	-	-	-	58,870	-	-	-	-	-	367	327	-	-	-	-	-	-
SANTA CLARA VALLEY WD	-	-	-	-	71,521	-	-	-	-	-	7,334	41,839	-	-	-	-	-	-
<b>Subtotal</b>	-	-	-	-	<b>189,852</b>	-	-	-	<b>27,734</b>	<b>5,658</b>	<b>74,134</b>	<b>65,106</b>	-	-	-	<b>7,340</b>	-	-
<b>SAN JOAQUIN VALLEY</b>																		
OAK FLAT WATER DISTRICT	-	-	-	-	3,372	-	-	-	-	-	2,385	1,513	-	-	-	367	-	-
COUNTY OF KINGS	-	-	-	-	3,915	-	-	-	-	-	-	9	-	-	-	48	-	-
DEVIL'S DEN WATER DISTRICT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUDLEY RIDGE WATER DISTRICT	-	-	-	-	4,359	-	-	-	-	75	2,619	-	-	-	-	-	-	-
EMPIRE WEST SIDE ID	-	-	-	-	4,163	-	-	-	-	53	647	985	-	-	-	1,349	-	-
HACIENDA WATER DISTRICT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KERN COUNTY WA	-	-	-	-	741,828	-	-	-	-	-	44,784	8,396	-	-	-	-	-	-
TULARE LAKE BASIN WSD	-	-	-	-	100,166	-	-	-	-	449	166	31,102	-	-	-	13	-	-
<b>Subtotal</b>	-	-	-	-	<b>857,803</b>	-	-	-	<b>795</b>	<b>577</b>	<b>50,601</b>	<b>42,005</b>	-	-	-	<b>1,777</b>	-	-
<b>CENTRAL COASTAL</b>																		
SAN LUIS OBISPO COUNTY FC&WCD	-	-	-	-	25,996	-	-	-	-	-	51,816	12,500	-	-	-	6,009	-	-
SANTA BARBARA COUNTY FC&WCD	-	-	-	-	79,494	-	-	-	-	-	49,786	21,353	-	-	-	9,109	-	-
<b>Subtotal</b>	-	-	-	-	<b>105,490</b>	-	-	-	-	-	<b>101,602</b>	<b>33,853</b>	-	-	-	<b>15,118</b>	-	-
<b>SOUTHERN CALIFORNIA</b>																		
ANTELOPE VALLEY-EAST KERN WA	-	-	-	-	261,238	-	-	21	21	38,752	214,050	60,413	-	-	-	43,999	-	-
CASTAIC LAKE WA	-	-	-	-	96,507	-	-	-	-	12,820	41,586	34,226	-	-	-	16,883	-	-
COACHELLA VALLEY WD	-	-	-	-	-	-	-	-	-	-	60,550	-	-	-	-	-	-	-
CRESTLINE-LAKE ARROWHEAD WA	-	-	-	-	8,332	-	-	-	-	1,764	11,596	2,900	-	-	-	3,797	-	-
DESERT WATER AGENCY	-	-	-	-	-	-	-	-	-	-	11,832	-	-	-	-	-	-	-
LITTLEROCK CREEK ID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
THE METROPOLITAN WATER DISTRICT OF	-	-	-	-	581,820	-	-	-	-	3,853	114,812	201,902	-	-	-	-	-	-
MOJAVE WATER AGENCY	-	-	-	-	42,730	-	-	262	262	36,699	130,852	37,163	-	-	-	-	-	-
PALMDALE WATER DISTRICT	-	-	-	-	23,036	-	-	-	-	1,758	31,510	9,665	-	-	-	46	-	-
SAN BERNARDINO VALLEY MWD	-	-	-	-	136,569	-	-	1,708	1,708	30,891	128,060	51,300	-	-	-	9,639	-	-
SAN GABRIEL VALLEY MWD	-	-	-	-	49,771	-	-	-	-	-	14,693	1,636	-	-	-	4	-	-
SAN GORGONIO PASS WA	-	-	-	-	-	-	-	-	-	-	9,769	2,972	-	-	-	1,961	-	-
VENTURA COUNTY WPD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,110	-	-
<b>Subtotal</b>	-	-	-	-	<b>1,200,003</b>	-	-	<b>1,991</b>	<b>29,569</b>	<b>126,537</b>	<b>769,310</b>	<b>402,177</b>	-	-	-	<b>83,439</b>	-	-
<b>TOTAL</b>	-	-	-	-	<b>2,411,614</b>	-	-	<b>2,388</b>	<b>85,486</b>	<b>152,809</b>	<b>1,102,768</b>	<b>576,581</b>	-	-	-	<b>147,894</b>	-	-

## **Appendix C – Letter to Bureau of Reclamation**

---

---

## ***Kern River Watermaster***

16294 Highway 43



P.O. Box 1168

Wasco, California 93280



Office: (661) 758-5153

Fax: (661) 758-6167

September 28, 2015

Bureau of Reclamation  
South Central California Area Office  
1243 "N" Street  
Fresno, CA. 93721-1813  
Attn: George Bushard

Re: Delta Lands Reclamation District No. 770 Floodwater Disposal-2015 and 2016  
water year

Dear Mr. Bushard:

Delta Lands RD No. 770 indicated that it anticipates a need to dispose of potentially damaging floodwater diverted from the Kaweah and Tule Rivers into the Friant-Kern Canal (FKC) system. I understand this water to be floodwater that will be diverted so as to reduce potential damages to lands within the area served by DLRD No. 770. I also understand that the portions of the floodwater diverted into the FKC can be disposed of by discharging it into the Kern River at the terminus of the FKC. I have no objection to accepting the floodwater for disposition in the Kern River basin, provided that Delta Lands coordinates its operations with the Kern River Watermaster or designee on behalf of the water users, as it has in the past, and it is understood that I reserve the right (after providing reasonable notice to all parties sufficient to allow the disposition of water already in the FKC and destined for the Kern River) to decide acceptance of that

water if Delta Lands fails to provide adequate coordination or conditions develop with local supplies that require termination of Delta Lands program. Further, it is my understanding that DLRD No. 770 has agreed to take responsibility for the safe disposal of the floodwater.

Please feel free to contact me if you have any questions.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Dana S. Munn', with a long horizontal line extending to the right.

**DANA S. MUNN**  
Kern River Watermaster

Cc: Kern River Interests (by email)

## **Appendix D – EDR Report for Palms Project**

---

---



**Buena Vista Palms**

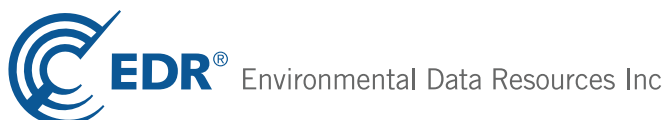
BVWSD

Buttonwillow, CA 93206

Inquiry Number: 4394757.2s

August 26, 2015

**The EDR Radius Map™ Report with GeoCheck®**



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

# TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
Executive Summary .....	ES1
Overview Map .....	2
Detail Map .....	3
Map Findings Summary .....	4
Map Findings .....	8
Orphan Summary .....	9
Government Records Searched/Data Currency Tracking .....	GR-1
 <b><u>GEOCHECK ADDENDUM</u></b>	
Physical Setting Source Addendum .....	A-1
Physical Setting Source Summary .....	A-2
Physical Setting SSURGO Soil Map .....	A-5
Physical Setting Source Map .....	A-8
Physical Setting Source Map Findings .....	A-10
Physical Setting Source Records Searched .....	PSGR-1

***Thank you for your business.***  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

### Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2015 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

## EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

### TARGET PROPERTY INFORMATION

#### ADDRESS

BVWSD  
BUTTONWILLOW, CA 93206

#### COORDINATES

Latitude (North): 35.3204000 - 35° 19' 13.44"  
Longitude (West): 119.3826000 - 119° 22' 57.36"  
Universal Transverse Mercator: Zone 11  
UTM X (Meters): 283408.8  
UTM Y (Meters): 3910981.2  
Elevation: 288 ft. above sea level

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 5639479 EAST ELK HILLS, CA  
Version Date: 2012

East Map: 5639513 TUPMAN, CA  
Version Date: 2012

### AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20120630  
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:  
BVWSD  
BUTTONWILLOW, CA 93206

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
<a href="#">Reg</a>	NAVAL PETROLEUM RESE		DOD	Same	4084, 0.773, South

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

NPL..... National Priority List  
Proposed NPL..... Proposed National Priority List Sites  
NPL LIENS..... Federal Superfund Liens

### ***Federal Delisted NPL site list***

Delisted NPL..... National Priority List Deletions

### ***Federal CERCLIS list***

FEDERAL FACILITY..... Federal Facility Site Information listing  
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System

### ***Federal CERCLIS NFRAP site List***

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned

### ***Federal RCRA CORRACTS facilities list***

CORRACTS..... Corrective Action Report

### ***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

### ***Federal RCRA generators list***

RCRA-LQG..... RCRA - Large Quantity Generators  
RCRA-SQG..... RCRA - Small Quantity Generators  
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

### ***Federal institutional controls / engineering controls registries***

LUCIS..... Land Use Control Information System  
US ENG CONTROLS..... Engineering Controls Sites List

## EXECUTIVE SUMMARY

US INST CONTROL..... Sites with Institutional Controls

### **Federal ERNS list**

ERNS..... Emergency Response Notification System

### **State- and tribal - equivalent NPL**

RESPONSE..... State Response Sites

### **State- and tribal - equivalent CERCLIS**

ENVIROSTOR..... EnviroStor Database

### **State and tribal landfill and/or solid waste disposal site lists**

SWF/LF..... Solid Waste Information System

### **State and tribal leaking storage tank lists**

LUST..... Geotracker's Leaking Underground Fuel Tank Report

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

SLIC..... Statewide SLIC Cases

### **State and tribal registered storage tank lists**

FEMA UST..... Underground Storage Tank Listing

UST..... Active UST Facilities

AST..... Aboveground Petroleum Storage Tank Facilities

INDIAN UST..... Underground Storage Tanks on Indian Land

### **State and tribal voluntary cleanup sites**

VCP..... Voluntary Cleanup Program Properties

INDIAN VCP..... Voluntary Cleanup Priority Listing

### **State and tribal Brownfields sites**

BROWNFIELDS..... Considered Brownfields Sites Listing

## **ADDITIONAL ENVIRONMENTAL RECORDS**

### **Local Brownfield lists**

US BROWNFIELDS..... A Listing of Brownfields Sites

### **Local Lists of Landfill / Solid Waste Disposal Sites**

WMUDS/SWAT..... Waste Management Unit Database

SWRCY..... Recycler Database

HAULERS..... Registered Waste Tire Haulers Listing

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands

ODI..... Open Dump Inventory

DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations

## EXECUTIVE SUMMARY

### **Local Lists of Hazardous waste / Contaminated Sites**

US HIST CDL..... National Clandestine Laboratory Register  
HIST Cal-Sites..... Historical Calsites Database  
SCH..... School Property Evaluation Program  
CDL..... Clandestine Drug Labs  
Toxic Pits..... Toxic Pits Cleanup Act Sites  
US CDL..... Clandestine Drug Labs

### **Local Lists of Registered Storage Tanks**

SWEEPS UST..... SWEEPS UST Listing  
HIST UST..... Hazardous Substance Storage Container Database  
CA FID UST..... Facility Inventory Database

### **Local Land Records**

LIENS..... Environmental Liens Listing  
LIENS 2..... CERCLA Lien Information  
DEED..... Deed Restriction Listing

### **Records of Emergency Release Reports**

HMIRS..... Hazardous Materials Information Reporting System  
CHMIRS..... California Hazardous Material Incident Report System  
LDS..... Land Disposal Sites Listing  
MCS..... Military Cleanup Sites Listing  
SPILLS 90..... SPILLS 90 data from FirstSearch

### **Other Ascertainable Records**

RCRA NonGen / NLR..... RCRA - Non Generators / No Longer Regulated  
FUDS..... Formerly Used Defense Sites  
SCRD DRYCLEANERS..... State Coalition for Remediation of Drycleaners Listing  
US FIN ASSUR..... Financial Assurance Information  
EPA WATCH LIST..... EPA WATCH LIST  
2020 COR ACTION..... 2020 Corrective Action Program List  
TSCA..... Toxic Substances Control Act  
TRIS..... Toxic Chemical Release Inventory System  
SSTS..... Section 7 Tracking Systems  
ROD..... Records Of Decision  
RMP..... Risk Management Plans  
RAATS..... RCRA Administrative Action Tracking System  
PRP..... Potentially Responsible Parties  
PADS..... PCB Activity Database System  
ICIS..... Integrated Compliance Information System  
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)  
MLTS..... Material Licensing Tracking System  
COAL ASH DOE..... Steam-Electric Plant Operation Data  
COAL ASH EPA..... Coal Combustion Residues Surface Impoundments List  
PCB TRANSFORMER..... PCB Transformer Registration Database  
RADINFO..... Radiation Information Database  
HIST FTTS..... FIFRA/TSCA Tracking System Administrative Case Listing

## EXECUTIVE SUMMARY

DOT OPS.....	Incident and Accident Data
CONSENT.....	Superfund (CERCLA) Consent Decrees
INDIAN RESERV.....	Indian Reservations
UMTRA.....	Uranium Mill Tailings Sites
LEAD SMELTERS.....	Lead Smelter Sites
US AIRS.....	Aerometric Information Retrieval System Facility Subsystem
US MINES.....	Mines Master Index File
FINDS.....	Facility Index System/Facility Registry System
CA BOND EXP. PLAN.....	Bond Expenditure Plan
Cortese.....	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings.....	CUPA Resources List
DRYCLEANERS.....	Cleaner Facilities
EML.....	Emissions Inventory Data
ENF.....	Enforcement Action Listing
Financial Assurance.....	Financial Assurance Information Listing
HAZNET.....	Facility and Manifest Data
HIST CORTESE.....	Hazardous Waste & Substance Site List
HWP.....	EnviroStor Permitted Facilities Listing
HWT.....	Registered Hazardous Waste Transporter Database
MINES.....	Mines Site Location Listing
MWMP.....	Medical Waste Management Program Listing
NPDES.....	NPDES Permits Listing
PEST LIC.....	Pesticide Regulation Licenses Listing
PROC.....	Certified Processors Database
Notify 65.....	Proposition 65 Records
UIC.....	UIC Listing
WASTEWATER PITS.....	Oil Wastewater Pits Listing
WDS.....	Waste Discharge System
WIP.....	Well Investigation Program Case List

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat.....	EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners.....	EDR Exclusive Historic Dry Cleaners

### EDR RECOVERED GOVERNMENT ARCHIVES

#### ***Exclusive Recovered Govt. Archives***

RGA LF.....	Recovered Government Archive Solid Waste Facilities List
RGA LUST.....	Recovered Government Archive Leaking Underground Storage Tank

### SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property. Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.



# EXECUTIVE SUMMARY

## ADDITIONAL ENVIRONMENTAL RECORDS

### ***Other Ascertainable Records***

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

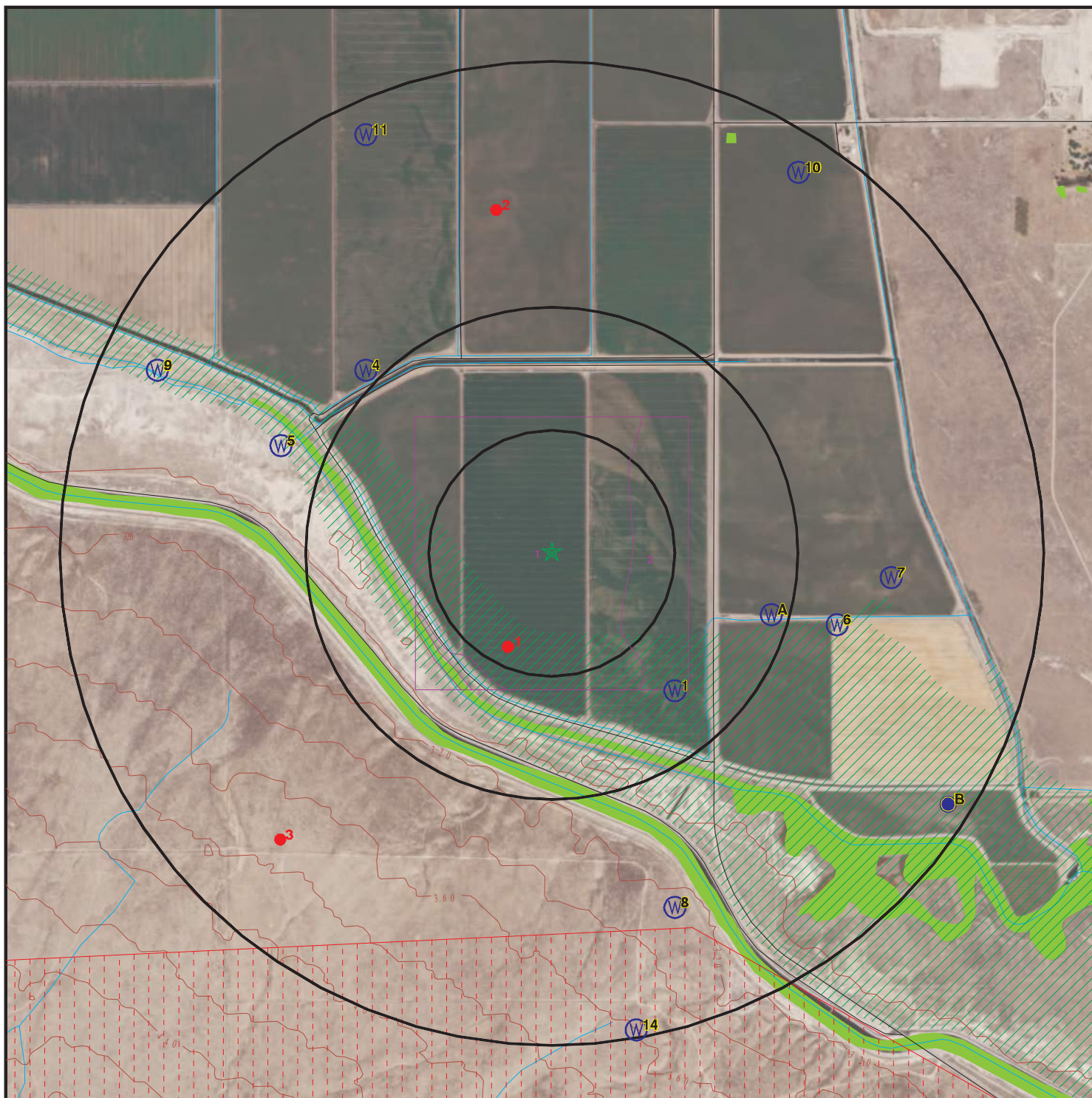
A review of the DOD list, as provided by EDR, and dated 12/31/2005 has revealed that there is 1 DOD site within approximately 1 mile of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
NAVAL PETROLEUM RESE		S 1/2 - 1 (0.773 mi.)	0	8

## EXECUTIVE SUMMARY

There were no unmapped sites in this report.

# OVERVIEW MAP - 4394757.2S



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

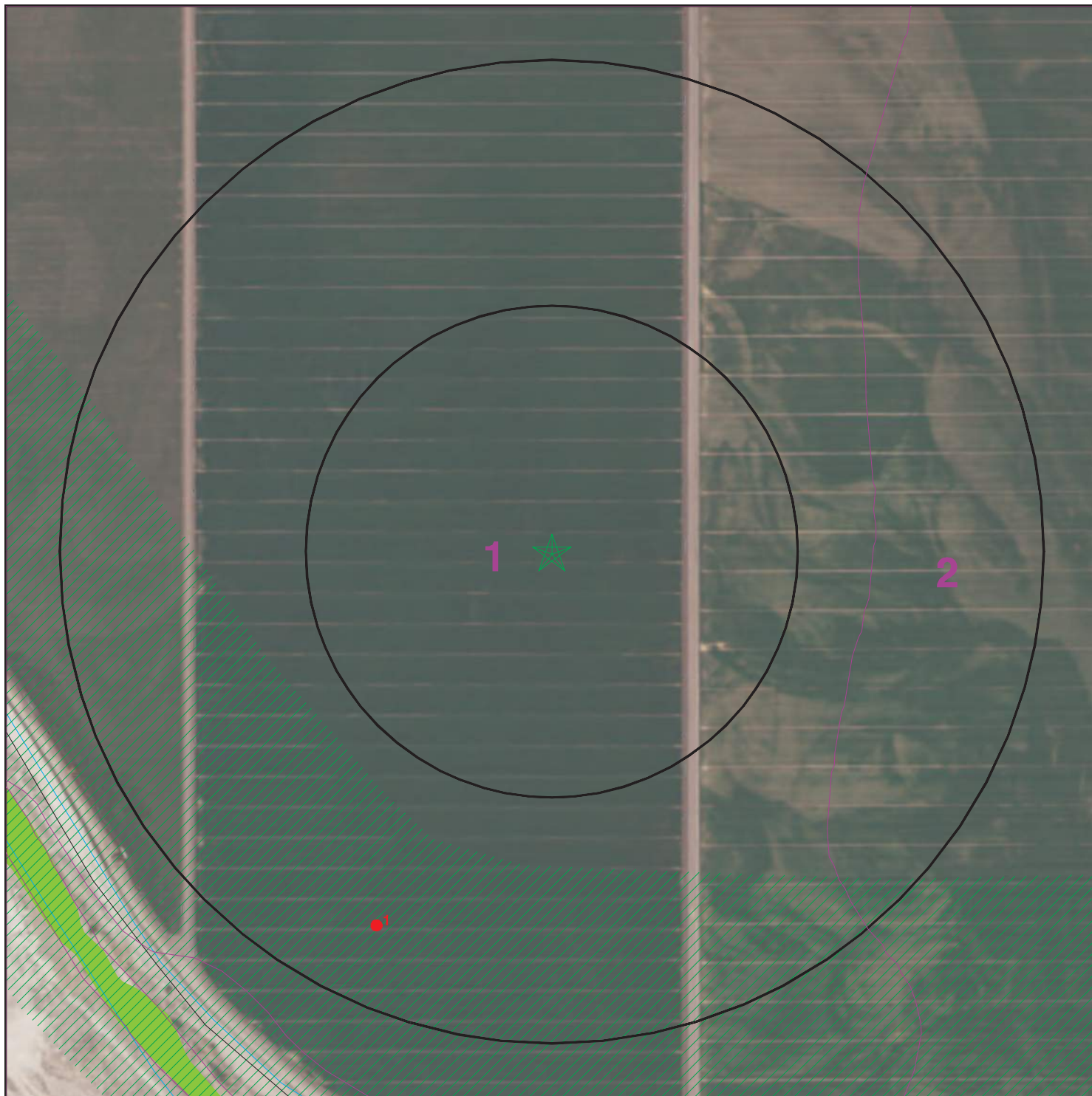
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Buena Vista Palms  
 ADDRESS: BVWSD  
 Buttonwillow CA 93206  
 LAT/LONG: 35.3204 / 119.3826

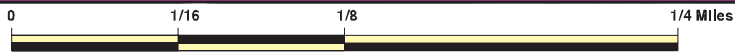
CLIENT: GEI Consultants  
 CONTACT: Stephanie  
 INQUIRY #: 4394757.2s  
 DATE: August 26, 2015 5:23 pm

# DETAIL MAP - 4394757.2S



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ⚙ Manufactured Gas Plants
- ⚡ Sensitive Receptors
- ☒ National Priority List Sites
- ☒ Dept. Defense Sites

- ☒ Indian Reservations BIA
- ☒ 100-year flood zone
- ☒ 500-year flood zone
- ☒ National Wetland Inventory
- ☒ Areas of Concern



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Buena Vista Palms  
 ADDRESS: BVWSD  
 Buttonwillow CA 93206  
 LAT/LONG: 35.3204 / 119.3826

CLIENT: GEI Consultants  
 CONTACT: Stephanie  
 INQUIRY #: 4394757.2s  
 DATE: August 26, 2015 5:24 pm

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<b>STANDARD ENVIRONMENTAL RECORDS</b>								
<b><i>Federal NPL site list</i></b>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
<b><i>Federal Delisted NPL site list</i></b>								
Delisted NPL	1.000		0	0	0	0	NR	0
<b><i>Federal CERCLIS list</i></b>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
CERCLIS	0.500		0	0	0	NR	NR	0
<b><i>Federal CERCLIS NFRAP site List</i></b>								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA CORRACTS facilities list</i></b>								
CORRACTS	1.000		0	0	0	0	NR	0
<b><i>Federal RCRA non-CORRACTS TSD facilities list</i></b>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA generators list</i></b>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<b><i>Federal institutional controls / engineering controls registries</i></b>								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
<b><i>Federal ERNS list</i></b>								
ERNS	TP		NR	NR	NR	NR	NR	0
<b><i>State- and tribal - equivalent NPL RESPONSE</i></b>								
RESPONSE	1.000		0	0	0	0	NR	0
<b><i>State- and tribal - equivalent CERCLIS ENVIROSTOR</i></b>								
ENVIROSTOR	1.000		0	0	0	0	NR	0
<b><i>State and tribal landfill and/or solid waste disposal site lists</i></b>								
SWF/LF	0.500		0	0	0	NR	NR	0
<b><i>State and tribal leaking storage tank lists</i></b>								
LUST	0.500		0	0	0	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
<b><i>State and tribal registered storage tank lists</i></b>								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
<b><i>State and tribal voluntary cleanup sites</i></b>								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
<b><i>State and tribal Brownfields sites</i></b>								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b><u>ADDITIONAL ENVIRONMENTAL RECORDS</u></b>								
<b><i>Local Brownfield lists</i></b>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b><i>Local Lists of Landfill / Solid Waste Disposal Sites</i></b>								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
<b><i>Local Lists of Hazardous waste / Contaminated Sites</i></b>								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
<b><i>Local Lists of Registered Storage Tanks</i></b>								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
<b><i>Local Land Records</i></b>								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
<b><i>Records of Emergency Release Reports</i></b>								
HMIRS	TP		NR	NR	NR	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
<b>Other Ascertainable Records</b>								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	1	NR	1
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	TP		NR	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0



## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0

### EDR HIGH RISK HISTORICAL RECORDS

#### *EDR Exclusive Records*

EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

### EDR RECOVERED GOVERNMENT ARCHIVES

#### *Exclusive Recovered Govt. Archives*

RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0

- Totals --		0	0	0	0	1	0	1
-------------	--	---	---	---	---	---	---	---

#### NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**DOD**  
**Region**  
**South**  
**1/2-1**  
**4084 ft.**

**NAVAL PETROLEUM RESERVE NUMBER ONE**  
**NAVAL PETROLEUM RESERVE N (County), CA**

**DOD** **CUSA139675**  
**N/A**

DOD:

Feature 1: Navy DOD  
Feature 2: Not reported  
Feature 3: Not reported  
URL: Not reported  
Name 1: Naval Petroleum Reserve Number One  
Name 2: Not reported  
Name 3: Not reported  
State: CA  
DOD Site: Yes  
Tile name: CAKERN

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
NO SITES FOUND					

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

#### **NPL: National Priority List**

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/26/2015	Source: EPA
Date Data Arrived at EDR: 04/08/2015	Telephone: N/A
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/09/2015
Number of Days to Update: 75	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Quarterly

#### **NPL Site Boundaries**

##### **Sources:**

EPA's Environmental Photographic Interpretation Center (EPIC)  
Telephone: 202-564-7333

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

#### **Proposed NPL: Proposed National Priority List Sites**

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/26/2015	Source: EPA
Date Data Arrived at EDR: 04/08/2015	Telephone: N/A
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/09/2015
Number of Days to Update: 75	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Quarterly

#### **NPL LIENS: Federal Superfund Liens**

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***Federal Delisted NPL site list***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/26/2015	Source: EPA
Date Data Arrived at EDR: 04/08/2015	Telephone: N/A
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/09/2015
Number of Days to Update: 75	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Quarterly

## ***Federal CERCLIS list***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/26/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/08/2015	Telephone: 703-603-8704
Date Made Active in Reports: 06/11/2015	Last EDR Contact: 07/10/2015
Number of Days to Update: 64	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Varies

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 11/11/2013	Telephone: 703-412-9810
Date Made Active in Reports: 02/13/2014	Last EDR Contact: 05/29/2015
Number of Days to Update: 94	Next Scheduled EDR Contact: 09/07/2015
	Data Release Frequency: Quarterly

## ***Federal CERCLIS NFRAP site List***

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 11/11/2013	Telephone: 703-412-9810
Date Made Active in Reports: 02/13/2014	Last EDR Contact: 05/29/2015
Number of Days to Update: 94	Next Scheduled EDR Contact: 09/07/2015
	Data Release Frequency: Quarterly

## ***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: EPA  
Telephone: 800-424-9346  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

## ***Federal RCRA non-CORRACTS TSD facilities list***

### **RCRA-TSDF: RCRA - Treatment, Storage and Disposal**

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: (415) 495-8895  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

## ***Federal RCRA generators list***

### **RCRA-LQG: RCRA - Large Quantity Generators**

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: (415) 495-8895  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

### **RCRA-SQG: RCRA - Small Quantity Generators**

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: (415) 495-8895  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

### **RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators**

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: (415) 495-8895  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***Federal institutional controls / engineering controls registries***

### **LUCIS: Land Use Control Information System**

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015	Source: Department of the Navy
Date Data Arrived at EDR: 05/29/2015	Telephone: 843-820-7326
Date Made Active in Reports: 06/11/2015	Last EDR Contact: 08/12/2015
Number of Days to Update: 13	Next Scheduled EDR Contact: 11/30/2015
	Data Release Frequency: Varies

### **US ENG CONTROLS: Engineering Controls Sites List**

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/16/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/17/2015	Telephone: 703-603-0695
Date Made Active in Reports: 06/02/2015	Last EDR Contact: 06/01/2015
Number of Days to Update: 77	Next Scheduled EDR Contact: 09/14/2015
	Data Release Frequency: Varies

### **US INST CONTROL: Sites with Institutional Controls**

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/16/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/17/2015	Telephone: 703-603-0695
Date Made Active in Reports: 06/02/2015	Last EDR Contact: 06/01/2015
Number of Days to Update: 77	Next Scheduled EDR Contact: 09/14/2015
	Data Release Frequency: Varies

## ***Federal ERNS list***

### **ERNS: Emergency Response Notification System**

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/30/2015	Source: National Response Center, United States Coast Guard
Date Data Arrived at EDR: 03/31/2015	Telephone: 202-267-2180
Date Made Active in Reports: 06/02/2015	Last EDR Contact: 06/26/2015
Number of Days to Update: 63	Next Scheduled EDR Contact: 10/12/2015
	Data Release Frequency: Annually

## ***State- and tribal - equivalent NPL***

### **RESPONSE: State Response Sites**

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 05/04/2015	Source: Department of Toxic Substances Control
Date Data Arrived at EDR: 05/05/2015	Telephone: 916-323-3400
Date Made Active in Reports: 05/14/2015	Last EDR Contact: 08/04/2015
Number of Days to Update: 9	Next Scheduled EDR Contact: 11/16/2015
	Data Release Frequency: Quarterly

## ***State- and tribal - equivalent CERCLIS***

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ENVIROSTOR: EnviroStor Database

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

Date of Government Version: 05/04/2015	Source: Department of Toxic Substances Control
Date Data Arrived at EDR: 05/05/2015	Telephone: 916-323-3400
Date Made Active in Reports: 05/14/2015	Last EDR Contact: 08/04/2015
Number of Days to Update: 9	Next Scheduled EDR Contact: 11/16/2015
	Data Release Frequency: Quarterly

## **State and tribal landfill and/or solid waste disposal site lists**

### SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inventory of solid waste disposal facilities or landfills. These may be active or inactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/18/2015	Source: Department of Resources Recycling and Recovery
Date Data Arrived at EDR: 05/20/2015	Telephone: 916-341-6320
Date Made Active in Reports: 06/05/2015	Last EDR Contact: 05/20/2015
Number of Days to Update: 16	Next Scheduled EDR Contact: 08/31/2015
	Data Release Frequency: Quarterly

## **State and tribal leaking storage tank lists**

### LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005	Source: California Regional Water Quality Control Board Santa Ana Region (8)
Date Data Arrived at EDR: 02/15/2005	Telephone: 909-782-4496
Date Made Active in Reports: 03/28/2005	Last EDR Contact: 08/15/2011
Number of Days to Update: 41	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: Varies

### LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003	Source: California Regional Water Quality Control Board Central Coast Region (3)
Date Data Arrived at EDR: 05/19/2003	Telephone: 805-542-4786
Date Made Active in Reports: 06/02/2003	Last EDR Contact: 07/18/2011
Number of Days to Update: 14	Next Scheduled EDR Contact: 10/31/2011
	Data Release Frequency: No Update Planned

### LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004	Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Date Data Arrived at EDR: 02/26/2004	Telephone: 760-776-8943
Date Made Active in Reports: 03/24/2004	Last EDR Contact: 08/01/2011
Number of Days to Update: 27	Next Scheduled EDR Contact: 11/14/2011
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005	Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Date Data Arrived at EDR: 06/07/2005	Telephone: 760-241-7365
Date Made Active in Reports: 06/29/2005	Last EDR Contact: 09/12/2011
Number of Days to Update: 22	Next Scheduled EDR Contact: 12/26/2011
	Data Release Frequency: No Update Planned

## LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003	Source: California Regional Water Quality Control Board Lahontan Region (6)
Date Data Arrived at EDR: 09/10/2003	Telephone: 530-542-5572
Date Made Active in Reports: 10/07/2003	Last EDR Contact: 09/12/2011
Number of Days to Update: 27	Next Scheduled EDR Contact: 12/26/2011
	Data Release Frequency: No Update Planned

## LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008	Source: California Regional Water Quality Control Board Central Valley Region (5)
Date Data Arrived at EDR: 07/22/2008	Telephone: 916-464-4834
Date Made Active in Reports: 07/31/2008	Last EDR Contact: 07/01/2011
Number of Days to Update: 9	Next Scheduled EDR Contact: 10/17/2011
	Data Release Frequency: No Update Planned

## LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001	Source: California Regional Water Quality Control Board San Diego Region (9)
Date Data Arrived at EDR: 04/23/2001	Telephone: 858-637-5595
Date Made Active in Reports: 05/21/2001	Last EDR Contact: 09/26/2011
Number of Days to Update: 28	Next Scheduled EDR Contact: 01/09/2012
	Data Release Frequency: No Update Planned

## LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004	Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Date Data Arrived at EDR: 10/20/2004	Telephone: 510-622-2433
Date Made Active in Reports: 11/19/2004	Last EDR Contact: 09/19/2011
Number of Days to Update: 30	Next Scheduled EDR Contact: 01/02/2012
	Data Release Frequency: Quarterly

## LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001	Source: California Regional Water Quality Control Board North Coast (1)
Date Data Arrived at EDR: 02/28/2001	Telephone: 707-570-3769
Date Made Active in Reports: 03/29/2001	Last EDR Contact: 08/01/2011
Number of Days to Update: 29	Next Scheduled EDR Contact: 11/14/2011
	Data Release Frequency: No Update Planned



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 06/15/2015	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/17/2015	Telephone: see region list
Date Made Active in Reports: 07/14/2015	Last EDR Contact: 06/17/2015
Number of Days to Update: 27	Next Scheduled EDR Contact: 09/28/2015
	Data Release Frequency: Quarterly

## LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004	Source: California Regional Water Quality Control Board Los Angeles Region (4)
Date Data Arrived at EDR: 09/07/2004	Telephone: 213-576-6710
Date Made Active in Reports: 10/12/2004	Last EDR Contact: 09/06/2011
Number of Days to Update: 35	Next Scheduled EDR Contact: 12/19/2011
	Data Release Frequency: No Update Planned

## INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/08/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/08/2015	Telephone: 415-972-3372
Date Made Active in Reports: 02/09/2015	Last EDR Contact: 07/31/2015
Number of Days to Update: 32	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/03/2015	Source: EPA Region 10
Date Data Arrived at EDR: 02/12/2015	Telephone: 206-553-2857
Date Made Active in Reports: 03/13/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 29	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/30/2015	Source: EPA, Region 5
Date Data Arrived at EDR: 05/29/2015	Telephone: 312-886-7439
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 24	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Varies

## INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/30/2015	Source: EPA Region 8
Date Data Arrived at EDR: 05/05/2015	Telephone: 303-312-6271
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 48	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/30/2015  
Date Data Arrived at EDR: 04/28/2015  
Date Made Active in Reports: 06/22/2015  
Number of Days to Update: 55

Source: EPA Region 7  
Telephone: 913-551-7003  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 03/17/2015  
Date Data Arrived at EDR: 05/01/2015  
Date Made Active in Reports: 06/22/2015  
Number of Days to Update: 52

Source: EPA Region 6  
Telephone: 214-665-6597  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/30/2014  
Date Data Arrived at EDR: 03/03/2015  
Date Made Active in Reports: 03/13/2015  
Number of Days to Update: 10

Source: EPA Region 4  
Telephone: 404-562-8677  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Semi-Annually

## INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/03/2015  
Date Data Arrived at EDR: 04/30/2015  
Date Made Active in Reports: 06/22/2015  
Number of Days to Update: 53

Source: EPA Region 1  
Telephone: 617-918-1313  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 27

Source: State Water Resources Control Board  
Telephone: 866-480-1028  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Varies

## SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003  
Date Data Arrived at EDR: 04/07/2003  
Date Made Active in Reports: 04/25/2003  
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)  
Telephone: 707-576-2220  
Last EDR Contact: 08/01/2011  
Next Scheduled EDR Contact: 11/14/2011  
Data Release Frequency: No Update Planned

## SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004  
Date Data Arrived at EDR: 10/20/2004  
Date Made Active in Reports: 11/19/2004  
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)  
Telephone: 510-286-0457  
Last EDR Contact: 09/19/2011  
Next Scheduled EDR Contact: 01/02/2012  
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006  
Date Data Arrived at EDR: 05/18/2006  
Date Made Active in Reports: 06/15/2006  
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)  
Telephone: 805-549-3147  
Last EDR Contact: 07/18/2011  
Next Scheduled EDR Contact: 10/31/2011  
Data Release Frequency: Semi-Annually

## SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004  
Date Data Arrived at EDR: 11/18/2004  
Date Made Active in Reports: 01/04/2005  
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)  
Telephone: 213-576-6600  
Last EDR Contact: 07/01/2011  
Next Scheduled EDR Contact: 10/17/2011  
Data Release Frequency: Varies

## SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005  
Date Data Arrived at EDR: 04/05/2005  
Date Made Active in Reports: 04/21/2005  
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)  
Telephone: 916-464-3291  
Last EDR Contact: 09/12/2011  
Next Scheduled EDR Contact: 12/26/2011  
Data Release Frequency: Semi-Annually

## SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005  
Date Data Arrived at EDR: 05/25/2005  
Date Made Active in Reports: 06/16/2005  
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch  
Telephone: 619-241-6583  
Last EDR Contact: 08/15/2011  
Next Scheduled EDR Contact: 11/28/2011  
Data Release Frequency: Semi-Annually

## SLIC REG 6L: SLIC Sites

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004  
Date Data Arrived at EDR: 09/07/2004  
Date Made Active in Reports: 10/12/2004  
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region  
Telephone: 530-542-5574  
Last EDR Contact: 08/15/2011  
Next Scheduled EDR Contact: 11/28/2011  
Data Release Frequency: No Update Planned

## SLIC REG 7: SLIC List

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004  
Date Data Arrived at EDR: 11/29/2004  
Date Made Active in Reports: 01/04/2005  
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region  
Telephone: 760-346-7491  
Last EDR Contact: 08/01/2011  
Next Scheduled EDR Contact: 11/14/2011  
Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008  
Date Data Arrived at EDR: 04/03/2008  
Date Made Active in Reports: 04/14/2008  
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)  
Telephone: 951-782-3298  
Last EDR Contact: 09/12/2011  
Next Scheduled EDR Contact: 12/26/2011  
Data Release Frequency: Semi-Annually

## SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007  
Date Data Arrived at EDR: 09/11/2007  
Date Made Active in Reports: 09/28/2007  
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)  
Telephone: 858-467-2980  
Last EDR Contact: 08/08/2011  
Next Scheduled EDR Contact: 11/21/2011  
Data Release Frequency: Annually

## **State and tribal registered storage tank lists**

### FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010  
Date Data Arrived at EDR: 02/16/2010  
Date Made Active in Reports: 04/12/2010  
Number of Days to Update: 55

Source: FEMA  
Telephone: 202-646-5797  
Last EDR Contact: 07/10/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Varies

### UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/06/2015  
Number of Days to Update: 19

Source: SWRCB  
Telephone: 916-341-5851  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Semi-Annually

### AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009  
Date Data Arrived at EDR: 09/10/2009  
Date Made Active in Reports: 10/01/2009  
Number of Days to Update: 21

Source: California Environmental Protection Agency  
Telephone: 916-327-5092  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

### INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 03/17/2015  
Date Data Arrived at EDR: 05/01/2015  
Date Made Active in Reports: 06/22/2015  
Number of Days to Update: 52

Source: EPA Region 6  
Telephone: 214-665-7591  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Semi-Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014	Source: EPA Region 7
Date Data Arrived at EDR: 11/25/2014	Telephone: 913-551-7003
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 65	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Varies

## INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/03/2015	Source: EPA, Region 1
Date Data Arrived at EDR: 04/30/2015	Telephone: 617-918-1313
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/31/2015
Number of Days to Update: 53	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Varies

## INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/14/2014	Source: EPA Region 9
Date Data Arrived at EDR: 02/13/2015	Telephone: 415-972-3368
Date Made Active in Reports: 03/13/2015	Last EDR Contact: 07/31/2015
Number of Days to Update: 28	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/06/2015	Source: EPA Region 10
Date Data Arrived at EDR: 05/19/2015	Telephone: 206-553-2857
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 34	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/30/2015	Source: EPA Region 5
Date Data Arrived at EDR: 05/26/2015	Telephone: 312-886-6136
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 27	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Varies

## INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 09/30/2014	Source: EPA Region 4
Date Data Arrived at EDR: 03/03/2015	Telephone: 404-562-9424
Date Made Active in Reports: 03/13/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 10	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Semi-Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/30/2015	Source: EPA Region 8
Date Data Arrived at EDR: 05/05/2015	Telephone: 303-312-6137
Date Made Active in Reports: 06/22/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 48	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## ***State and tribal voluntary cleanup sites***

### INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/29/2014	Source: EPA, Region 1
Date Data Arrived at EDR: 10/01/2014	Telephone: 617-918-1102
Date Made Active in Reports: 11/06/2014	Last EDR Contact: 06/26/2015
Number of Days to Update: 36	Next Scheduled EDR Contact: 10/12/2015
	Data Release Frequency: Varies

### INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008	Source: EPA, Region 7
Date Data Arrived at EDR: 04/22/2008	Telephone: 913-551-7365
Date Made Active in Reports: 05/19/2008	Last EDR Contact: 04/20/2009
Number of Days to Update: 27	Next Scheduled EDR Contact: 07/20/2009
	Data Release Frequency: Varies

### VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 05/04/2015	Source: Department of Toxic Substances Control
Date Data Arrived at EDR: 05/05/2015	Telephone: 916-323-3400
Date Made Active in Reports: 05/14/2015	Last EDR Contact: 08/04/2015
Number of Days to Update: 9	Next Scheduled EDR Contact: 11/16/2015
	Data Release Frequency: Quarterly

## ***State and tribal Brownfields sites***

### BROWNFIELDS: Considered Brownfields Sites Listing

A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 06/08/2015	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/09/2015	Telephone: 916-323-7905
Date Made Active in Reports: 07/10/2015	Last EDR Contact: 06/05/2015
Number of Days to Update: 31	Next Scheduled EDR Contact: 09/21/2015
	Data Release Frequency: Varies

## **ADDITIONAL ENVIRONMENTAL RECORDS**

### ***Local Brownfield lists***

#### US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/23/2015  
Date Data Arrived at EDR: 03/24/2015  
Date Made Active in Reports: 06/02/2015  
Number of Days to Update: 70

Source: Environmental Protection Agency  
Telephone: 202-566-2777  
Last EDR Contact: 06/24/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: Semi-Annually

## **Local Lists of Landfill / Solid Waste Disposal Sites**

### **WMUDS/SWAT: Waste Management Unit Database**

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000  
Date Data Arrived at EDR: 04/10/2000  
Date Made Active in Reports: 05/10/2000  
Number of Days to Update: 30

Source: State Water Resources Control Board  
Telephone: 916-227-4448  
Last EDR Contact: 08/04/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: No Update Planned

### **SWRCY: Recycler Database**

A listing of recycling facilities in California.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 47

Source: Department of Conservation  
Telephone: 916-323-3836  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

### **HAULERS: Registered Waste Tire Haulers Listing**

A listing of registered waste tire haulers.

Date of Government Version: 05/26/2015  
Date Data Arrived at EDR: 05/28/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 8

Source: Integrated Waste Management Board  
Telephone: 916-341-6422  
Last EDR Contact: 08/12/2015  
Next Scheduled EDR Contact: 11/30/2015  
Data Release Frequency: Varies

### **INDIAN ODI: Report on the Status of Open Dumps on Indian Lands**

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998  
Date Data Arrived at EDR: 12/03/2007  
Date Made Active in Reports: 01/24/2008  
Number of Days to Update: 52

Source: Environmental Protection Agency  
Telephone: 703-308-8245  
Last EDR Contact: 05/01/2015  
Next Scheduled EDR Contact: 08/17/2015  
Data Release Frequency: Varies

### **DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations**

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009  
Date Data Arrived at EDR: 05/07/2009  
Date Made Active in Reports: 09/21/2009  
Number of Days to Update: 137

Source: EPA, Region 9  
Telephone: 415-947-4219  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985

Date Data Arrived at EDR: 08/09/2004

Date Made Active in Reports: 09/17/2004

Number of Days to Update: 39

Source: Environmental Protection Agency

Telephone: 800-424-9346

Last EDR Contact: 06/09/2004

Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

## Local Lists of Hazardous waste / Contaminated Sites

### US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/25/2015

Date Data Arrived at EDR: 03/10/2015

Date Made Active in Reports: 03/25/2015

Number of Days to Update: 15

Source: Drug Enforcement Administration

Telephone: 202-307-1000

Last EDR Contact: 05/29/2015

Next Scheduled EDR Contact: 09/14/2015

Data Release Frequency: No Update Planned

### HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005

Date Data Arrived at EDR: 08/03/2006

Date Made Active in Reports: 08/24/2006

Number of Days to Update: 21

Source: Department of Toxic Substance Control

Telephone: 916-323-3400

Last EDR Contact: 02/23/2009

Next Scheduled EDR Contact: 05/25/2009

Data Release Frequency: No Update Planned

### SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 05/04/2015

Date Data Arrived at EDR: 05/05/2015

Date Made Active in Reports: 05/14/2015

Number of Days to Update: 9

Source: Department of Toxic Substances Control

Telephone: 916-323-3400

Last EDR Contact: 08/04/2015

Next Scheduled EDR Contact: 11/16/2015

Data Release Frequency: Quarterly

### CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2014

Date Data Arrived at EDR: 03/10/2015

Date Made Active in Reports: 03/18/2015

Number of Days to Update: 8

Source: Department of Toxic Substances Control

Telephone: 916-255-6504

Last EDR Contact: 08/07/2015

Next Scheduled EDR Contact: 10/28/2015

Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995  
Date Data Arrived at EDR: 08/30/1995  
Date Made Active in Reports: 09/26/1995  
Number of Days to Update: 27

Source: State Water Resources Control Board  
Telephone: 916-227-4364  
Last EDR Contact: 01/26/2009  
Next Scheduled EDR Contact: 04/27/2009  
Data Release Frequency: No Update Planned

## US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/25/2015  
Date Data Arrived at EDR: 03/10/2015  
Date Made Active in Reports: 03/25/2015  
Number of Days to Update: 15

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 05/29/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: Quarterly

## **Local Lists of Registered Storage Tanks**

### SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994  
Date Data Arrived at EDR: 07/07/2005  
Date Made Active in Reports: 08/11/2005  
Number of Days to Update: 35

Source: State Water Resources Control Board  
Telephone: N/A  
Last EDR Contact: 06/03/2005  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009  
Date Data Arrived at EDR: 09/23/2009  
Date Made Active in Reports: 10/01/2009  
Number of Days to Update: 8

Source: Department of Public Health  
Telephone: 707-463-4466  
Last EDR Contact: 06/01/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: Annually

### HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990  
Date Data Arrived at EDR: 01/25/1991  
Date Made Active in Reports: 02/12/1991  
Number of Days to Update: 18

Source: State Water Resources Control Board  
Telephone: 916-341-5851  
Last EDR Contact: 07/26/2001  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/31/1994  
Date Data Arrived at EDR: 09/05/1995  
Date Made Active in Reports: 09/29/1995  
Number of Days to Update: 24

Source: California Environmental Protection Agency  
Telephone: 916-341-5851  
Last EDR Contact: 12/28/1998  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## **Local Land Records**

### **LIENS: Environmental Liens Listing**

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/11/2015  
Date Data Arrived at EDR: 06/16/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 28

Source: Department of Toxic Substances Control  
Telephone: 916-323-3400  
Last EDR Contact: 06/05/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Varies

### **LIENS 2: CERCLA Lien Information**

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014  
Date Data Arrived at EDR: 03/18/2014  
Date Made Active in Reports: 04/24/2014  
Number of Days to Update: 37

Source: Environmental Protection Agency  
Telephone: 202-564-6023  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

### **DEED: Deed Restriction Listing**

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/08/2015  
Date Data Arrived at EDR: 06/09/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 35

Source: DTSC and SWRCB  
Telephone: 916-323-3400  
Last EDR Contact: 06/09/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Semi-Annually

## **Records of Emergency Release Reports**

### **HMIRS: Hazardous Materials Information Reporting System**

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/30/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: U.S. Department of Transportation  
Telephone: 202-366-4555  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Annually

### **CHMIRS: California Hazardous Material Incident Report System**

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 07/28/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 6

Source: Office of Emergency Services  
Telephone: 916-845-8400  
Last EDR Contact: 07/28/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 27

Source: State Water Quality Control Board  
Telephone: 866-480-1028  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

## MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 27

Source: State Water Resources Control Board  
Telephone: 866-480-1028  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

## SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012  
Date Data Arrived at EDR: 01/03/2013  
Date Made Active in Reports: 02/22/2013  
Number of Days to Update: 50

Source: FirstSearch  
Telephone: N/A  
Last EDR Contact: 01/03/2013  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## **Other Ascertainable Records**

### RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/10/2015  
Date Data Arrived at EDR: 03/31/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: (415) 495-8895  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Varies

### FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 06/06/2014  
Date Data Arrived at EDR: 09/10/2014  
Date Made Active in Reports: 09/18/2014  
Number of Days to Update: 8

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285  
Last EDR Contact: 07/08/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005	Source: USGS
Date Data Arrived at EDR: 11/10/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 07/14/2015
Number of Days to Update: 62	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Semi-Annually

## FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005	Source: U.S. Geological Survey
Date Data Arrived at EDR: 02/06/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 07/14/2015
Number of Days to Update: 339	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: N/A

## SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/09/2011	Telephone: 615-532-8599
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 05/21/2015
Number of Days to Update: 54	Next Scheduled EDR Contact: 08/31/2015
	Data Release Frequency: Varies

## US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/09/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/10/2015	Telephone: 202-566-1917
Date Made Active in Reports: 03/25/2015	Last EDR Contact: 08/12/2015
Number of Days to Update: 15	Next Scheduled EDR Contact: 11/30/2015
	Data Release Frequency: Quarterly

## EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 08/04/2015
Number of Days to Update: 88	Next Scheduled EDR Contact: 11/23/2015
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## 2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/03/2015	Telephone: 703-308-4044
Date Made Active in Reports: 03/09/2015	Last EDR Contact: 05/14/2015
Number of Days to Update: 6	Next Scheduled EDR Contact: 08/24/2015
	Data Release Frequency: Varies

## TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012	Source: EPA
Date Data Arrived at EDR: 01/15/2015	Telephone: 202-260-5521
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 06/25/2015
Number of Days to Update: 14	Next Scheduled EDR Contact: 10/05/2015
	Data Release Frequency: Every 4 Years

## TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2013	Source: EPA
Date Data Arrived at EDR: 02/12/2015	Telephone: 202-566-0250
Date Made Active in Reports: 06/02/2015	Last EDR Contact: 01/29/2015
Number of Days to Update: 110	Next Scheduled EDR Contact: 06/08/2015
	Data Release Frequency: Annually

## SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 07/22/2015
Number of Days to Update: 77	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Annually

## ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013	Source: EPA
Date Data Arrived at EDR: 12/12/2013	Telephone: 703-416-0223
Date Made Active in Reports: 02/24/2014	Last EDR Contact: 06/12/2015
Number of Days to Update: 74	Next Scheduled EDR Contact: 09/21/2015
	Data Release Frequency: Annually

## RMP: Risk Management Plans

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/13/2015	Telephone: 202-564-8600
Date Made Active in Reports: 03/25/2015	Last EDR Contact: 07/22/2015
Number of Days to Update: 40	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Varies

### RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

### PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 10/17/2014	Telephone: 202-564-6023
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 05/14/2015
Number of Days to Update: 3	Next Scheduled EDR Contact: 08/24/2015
	Data Release Frequency: Quarterly

### PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014	Source: EPA
Date Data Arrived at EDR: 10/15/2014	Telephone: 202-566-0500
Date Made Active in Reports: 11/17/2014	Last EDR Contact: 07/17/2015
Number of Days to Update: 33	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Annually

### ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/06/2015	Telephone: 202-564-5088
Date Made Active in Reports: 03/09/2015	Last EDR Contact: 07/09/2015
Number of Days to Update: 31	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Quarterly

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009  
Date Data Arrived at EDR: 04/16/2009  
Date Made Active in Reports: 05/11/2009  
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances  
Telephone: 202-566-1667  
Last EDR Contact: 05/20/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Quarterly

### FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009  
Date Data Arrived at EDR: 04/16/2009  
Date Made Active in Reports: 05/11/2009  
Number of Days to Update: 25

Source: EPA  
Telephone: 202-566-1667  
Last EDR Contact: 05/20/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Quarterly

### MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/31/2015  
Date Data Arrived at EDR: 04/09/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 63

Source: Nuclear Regulatory Commission  
Telephone: 301-415-7169  
Last EDR Contact: 06/04/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Quarterly

### COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 08/07/2009  
Date Made Active in Reports: 10/22/2009  
Number of Days to Update: 76

Source: Department of Energy  
Telephone: 202-586-8719  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Varies

### COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014  
Date Data Arrived at EDR: 09/10/2014  
Date Made Active in Reports: 10/20/2014  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: N/A  
Last EDR Contact: 06/12/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Varies

### PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011  
Date Data Arrived at EDR: 10/19/2011  
Date Made Active in Reports: 01/10/2012  
Number of Days to Update: 83

Source: Environmental Protection Agency  
Telephone: 202-566-0517  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

### RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/07/2015  
Date Data Arrived at EDR: 04/09/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 63

Source: Environmental Protection Agency  
Telephone: 202-343-9775  
Last EDR Contact: 07/09/2015  
Next Scheduled EDR Contact: 10/19/2015  
Data Release Frequency: Quarterly

## HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006  
Date Data Arrived at EDR: 03/01/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 12/17/2007  
Next Scheduled EDR Contact: 03/17/2008  
Data Release Frequency: No Update Planned

## HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006  
Date Data Arrived at EDR: 03/01/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 12/17/2008  
Next Scheduled EDR Contact: 03/17/2008  
Data Release Frequency: No Update Planned

## DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012  
Date Data Arrived at EDR: 08/07/2012  
Date Made Active in Reports: 09/18/2012  
Number of Days to Update: 42

Source: Department of Transportation, Office of Pipeline Safety  
Telephone: 202-366-4595  
Last EDR Contact: 08/04/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Varies

## CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 04/17/2015  
Date Made Active in Reports: 06/02/2015  
Number of Days to Update: 46

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Varies

## BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011  
Date Data Arrived at EDR: 02/26/2013  
Date Made Active in Reports: 04/19/2013  
Number of Days to Update: 52

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 05/29/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Biennially



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005	Source: USGS
Date Data Arrived at EDR: 12/08/2006	Telephone: 202-208-3710
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 07/14/2015
Number of Days to Update: 34	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Semi-Annually

## UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010	Source: Department of Energy
Date Data Arrived at EDR: 10/07/2011	Telephone: 505-845-0011
Date Made Active in Reports: 03/01/2012	Last EDR Contact: 05/26/2015
Number of Days to Update: 146	Next Scheduled EDR Contact: 09/07/2015
	Data Release Frequency: Varies

## LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/26/2014	Telephone: 703-603-8787
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 07/07/2015
Number of Days to Update: 64	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Varies

## LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust.

Date of Government Version: 04/05/2001	Source: American Journal of Public Health
Date Data Arrived at EDR: 10/27/2010	Telephone: 703-305-6451
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/02/2009
Number of Days to Update: 36	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

## US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/16/2014	Source: EPA
Date Data Arrived at EDR: 10/31/2014	Telephone: 202-564-2496
Date Made Active in Reports: 11/17/2014	Last EDR Contact: 06/22/2015
Number of Days to Update: 17	Next Scheduled EDR Contact: 10/05/2015
	Data Release Frequency: Annually

## US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/16/2014	Source: EPA
Date Data Arrived at EDR: 10/31/2014	Telephone: 202-564-2496
Date Made Active in Reports: 11/17/2014	Last EDR Contact: 06/22/2015
Number of Days to Update: 17	Next Scheduled EDR Contact: 10/22/2015
	Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 12/30/2014	Source: Department of Labor, Mine Safety and Health Administration
Date Data Arrived at EDR: 12/31/2014	Telephone: 303-231-5959
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 06/03/2015
Number of Days to Update: 29	Next Scheduled EDR Contact: 09/14/2015
	Data Release Frequency: Semi-Annually

## US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005	Source: USGS
Date Data Arrived at EDR: 02/29/2008	Telephone: 703-648-7709
Date Made Active in Reports: 04/18/2008	Last EDR Contact: 06/05/2015
Number of Days to Update: 49	Next Scheduled EDR Contact: 09/14/2015
	Data Release Frequency: Varies

## US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011	Source: USGS
Date Data Arrived at EDR: 06/08/2011	Telephone: 703-648-7709
Date Made Active in Reports: 09/13/2011	Last EDR Contact: 06/05/2015
Number of Days to Update: 97	Next Scheduled EDR Contact: 09/14/2015
	Data Release Frequency: Varies

## FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/18/2015	Source: EPA
Date Data Arrived at EDR: 02/27/2015	Telephone: (415) 947-8000
Date Made Active in Reports: 03/25/2015	Last EDR Contact: 06/10/2015
Number of Days to Update: 26	Next Scheduled EDR Contact: 09/21/2015
	Data Release Frequency: Quarterly

## CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989	Source: Department of Health Services
Date Data Arrived at EDR: 07/27/1994	Telephone: 916-255-2118
Date Made Active in Reports: 08/02/1994	Last EDR Contact: 05/31/1994
Number of Days to Update: 6	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

## CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/24/2015  
Date Data Arrived at EDR: 06/26/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 18

Source: CAL EPA/Office of Emergency Information  
Telephone: 916-323-3400  
Last EDR Contact: 06/26/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

## DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 02/18/2015  
Date Data Arrived at EDR: 02/20/2015  
Date Made Active in Reports: 03/12/2015  
Number of Days to Update: 20

Source: Department of Toxic Substance Control  
Telephone: 916-327-4498  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Annually

## EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2012  
Date Data Arrived at EDR: 03/25/2014  
Date Made Active in Reports: 04/28/2014  
Number of Days to Update: 34

Source: California Air Resources Board  
Telephone: 916-322-2990  
Last EDR Contact: 06/25/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: Varies

## ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 04/30/2015  
Date Data Arrived at EDR: 05/01/2015  
Date Made Active in Reports: 05/13/2015  
Number of Days to Update: 12

Source: State Water Resources Control Board  
Telephone: 916-445-9379  
Last EDR Contact: 08/07/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 04/30/2015  
Date Data Arrived at EDR: 05/01/2015  
Date Made Active in Reports: 05/13/2015  
Number of Days to Update: 12

Source: Department of Toxic Substances Control  
Telephone: 916-255-3628  
Last EDR Contact: 07/24/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/18/2015  
Date Data Arrived at EDR: 05/22/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 14

Source: California Integrated Waste Management Board  
Telephone: 916-341-6066  
Last EDR Contact: 05/18/2015  
Next Scheduled EDR Contact: 08/31/2015  
Data Release Frequency: Varies

## HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 10/15/2014  
Date Made Active in Reports: 11/19/2014  
Number of Days to Update: 35

Source: California Environmental Protection Agency  
Telephone: 916-255-1136  
Last EDR Contact: 07/17/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Annually

## HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSTES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001  
Date Data Arrived at EDR: 01/22/2009  
Date Made Active in Reports: 04/08/2009  
Number of Days to Update: 76

Source: Department of Toxic Substances Control  
Telephone: 916-323-3400  
Last EDR Contact: 01/22/2009  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/26/2015  
Date Data Arrived at EDR: 05/28/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 8

Source: Department of Toxic Substances Control  
Telephone: 916-323-3400  
Last EDR Contact: 05/28/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Quarterly

## HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/13/2015  
Date Data Arrived at EDR: 07/14/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 20

Source: Department of Toxic Substances Control  
Telephone: 916-440-7145  
Last EDR Contact: 07/14/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Quarterly

## MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 27

Source: Department of Conservation  
Telephone: 916-322-1080  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Varies

## MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/07/2015  
Date Data Arrived at EDR: 06/09/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 35

Source: Department of Public Health  
Telephone: 916-558-1784  
Last EDR Contact: 06/09/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Varies

## NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 05/18/2015  
Date Data Arrived at EDR: 05/20/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 22

Source: State Water Resources Control Board  
Telephone: 916-445-9379  
Last EDR Contact: 05/20/2015  
Next Scheduled EDR Contact: 08/31/2015  
Data Release Frequency: Quarterly

## PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/07/2015  
Date Data Arrived at EDR: 06/10/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 34

Source: Department of Pesticide Regulation  
Telephone: 916-445-4038  
Last EDR Contact: 06/10/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Quarterly

## PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 06/15/2015  
Date Data Arrived at EDR: 06/17/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 27

Source: Department of Conservation  
Telephone: 916-323-3836  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

## NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993  
Date Data Arrived at EDR: 11/01/1993  
Date Made Active in Reports: 11/19/1993  
Number of Days to Update: 18

Source: State Water Resources Control Board  
Telephone: 916-445-3846  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: No Update Planned

## UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 11/19/2014  
Date Data Arrived at EDR: 12/15/2014  
Date Made Active in Reports: 01/29/2015  
Number of Days to Update: 45

Source: Department of Conservation  
Telephone: 916-445-2408  
Last EDR Contact: 06/19/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Varies

## WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board's review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 04/15/2015  
Date Data Arrived at EDR: 04/17/2015  
Date Made Active in Reports: 06/23/2015  
Number of Days to Update: 67

Source: RWQCB, Central Valley Region  
Telephone: 559-445-5577  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Varies

## WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/19/2007  
Date Data Arrived at EDR: 06/20/2007  
Date Made Active in Reports: 06/29/2007  
Number of Days to Update: 9

Source: State Water Resources Control Board  
Telephone: 916-341-5227  
Last EDR Contact: 05/20/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Quarterly

## WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009  
Date Data Arrived at EDR: 07/21/2009  
Date Made Active in Reports: 08/03/2009  
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board  
Telephone: 213-576-6726  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Varies

## EDR HIGH RISK HISTORICAL RECORDS

### *EDR Exclusive Records*

#### EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

#### EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

#### EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

## EDR RECOVERED GOVERNMENT ARCHIVES

### *Exclusive Recovered Govt. Archives*

#### RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 01/13/2014  
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery  
Telephone: N/A  
Last EDR Contact: 06/01/2012  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

#### RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 12/30/2013  
Number of Days to Update: 182

Source: State Water Resources Control Board  
Telephone: N/A  
Last EDR Contact: 06/01/2012  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

## COUNTY RECORDS

### ALAMEDA COUNTY:

#### Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 07/21/2015  
Date Data Arrived at EDR: 07/24/2015  
Date Made Active in Reports: 08/05/2015  
Number of Days to Update: 12

Source: Alameda County Environmental Health Services  
Telephone: 510-567-6700  
Last EDR Contact: 08/10/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Semi-Annually

#### Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 07/21/2015  
Date Data Arrived at EDR: 07/22/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 12

Source: Alameda County Environmental Health Services  
Telephone: 510-567-6700  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Semi-Annually

### AMADOR COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CUPA Facility List

### Cupa Facility List

Date of Government Version: 06/05/2015  
Date Data Arrived at EDR: 06/09/2015  
Date Made Active in Reports: 07/10/2015  
Number of Days to Update: 31

Source: Amador County Environmental Health  
Telephone: 209-223-6439  
Last EDR Contact: 06/05/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Varies

## BUTTE COUNTY:

### CUPA Facility Listing

#### Cupa facility list.

Date of Government Version: 11/20/2014  
Date Data Arrived at EDR: 11/24/2014  
Date Made Active in Reports: 01/07/2015  
Number of Days to Update: 44

Source: Public Health Department  
Telephone: 530-538-7149  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: No Update Planned

## CALVERAS COUNTY:

### CUPA Facility Listing

#### Cupa Facility Listing

Date of Government Version: 07/15/2015  
Date Data Arrived at EDR: 07/17/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 17

Source: Calveras County Environmental Health  
Telephone: 209-754-6399  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

## COLUSA COUNTY:

### CUPA Facility List

#### Cupa facility list.

Date of Government Version: 06/11/2014  
Date Data Arrived at EDR: 06/13/2014  
Date Made Active in Reports: 07/07/2014  
Number of Days to Update: 24

Source: Health & Human Services  
Telephone: 530-458-0396  
Last EDR Contact: 08/10/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Varies

## CONTRA COSTA COUNTY:

### Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/26/2015  
Date Data Arrived at EDR: 05/29/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 13

Source: Contra Costa Health Services Department  
Telephone: 925-646-2286  
Last EDR Contact: 08/03/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Semi-Annually

## DEL NORTE COUNTY:



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CUPA Facility List

Cupa Facility list

Date of Government Version: 05/19/2015  
Date Data Arrived at EDR: 05/22/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 14

Source: Del Norte County Environmental Health Division  
Telephone: 707-465-0426  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Varies

## EL DORADO COUNTY:

### CUPA Facility List

CUPA facility list.

Date of Government Version: 05/26/2015  
Date Data Arrived at EDR: 05/29/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 7

Source: El Dorado County Environmental Management Department  
Telephone: 530-621-6623  
Last EDR Contact: 08/03/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Varies

## FRESNO COUNTY:

### CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/13/2015  
Date Data Arrived at EDR: 07/14/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 20

Source: Dept. of Community Health  
Telephone: 559-445-3271  
Last EDR Contact: 07/06/2015  
Next Scheduled EDR Contact: 10/19/2015  
Data Release Frequency: Semi-Annually

## HUMBOLDT COUNTY:

### CUPA Facility List

CUPA facility list.

Date of Government Version: 03/11/2015  
Date Data Arrived at EDR: 03/13/2015  
Date Made Active in Reports: 03/24/2015  
Number of Days to Update: 11

Source: Humboldt County Environmental Health  
Telephone: N/A  
Last EDR Contact: 07/14/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## IMPERIAL COUNTY:

### CUPA Facility List

Cupa facility list.

Date of Government Version: 04/27/2015  
Date Data Arrived at EDR: 04/28/2015  
Date Made Active in Reports: 05/13/2015  
Number of Days to Update: 15

Source: San Diego Border Field Office  
Telephone: 760-339-2777  
Last EDR Contact: 08/07/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## INYO COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CUPA Facility List

Cupa facility list.

Date of Government Version: 09/10/2013  
Date Data Arrived at EDR: 09/11/2013  
Date Made Active in Reports: 10/14/2013  
Number of Days to Update: 33

Source: Inyo County Environmental Health Services  
Telephone: 760-878-0238  
Last EDR Contact: 05/21/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## KERN COUNTY:

### Underground Storage Tank Sites & Tank Listing Kern County Sites and Tanks Listing.

Date of Government Version: 05/19/2015  
Date Data Arrived at EDR: 06/18/2015  
Date Made Active in Reports: 07/22/2015  
Number of Days to Update: 34

Source: Kern County Environment Health Services Department  
Telephone: 661-862-8700  
Last EDR Contact: 08/07/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Quarterly

## KINGS COUNTY:

### CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/26/2015  
Date Data Arrived at EDR: 05/28/2015  
Date Made Active in Reports: 06/15/2015  
Number of Days to Update: 13

Source: Kings County Department of Public Health  
Telephone: 559-584-1411  
Last EDR Contact: 05/21/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## LAKE COUNTY:

### CUPA Facility List

Cupa facility list

Date of Government Version: 05/05/2015  
Date Data Arrived at EDR: 05/07/2015  
Date Made Active in Reports: 05/20/2015  
Number of Days to Update: 13

Source: Lake County Environmental Health  
Telephone: 707-263-1164  
Last EDR Contact: 07/20/2015  
Next Scheduled EDR Contact: 11/02/2015  
Data Release Frequency: Varies

## LOS ANGELES COUNTY:

### San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009  
Date Data Arrived at EDR: 03/31/2009  
Date Made Active in Reports: 10/23/2009  
Number of Days to Update: 206

Source: EPA Region 9  
Telephone: 415-972-3178  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/24/2014	Source: Department of Public Works
Date Data Arrived at EDR: 01/30/2015	Telephone: 626-458-3517
Date Made Active in Reports: 03/04/2015	Last EDR Contact: 07/10/2015
Number of Days to Update: 33	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Semi-Annually

## List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/20/2015	Source: La County Department of Public Works
Date Data Arrived at EDR: 07/21/2015	Telephone: 818-458-5185
Date Made Active in Reports: 08/03/2015	Last EDR Contact: 07/21/2015
Number of Days to Update: 13	Next Scheduled EDR Contact: 11/02/2015
	Data Release Frequency: Varies

## City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2015	Source: Engineering & Construction Division
Date Data Arrived at EDR: 07/27/2015	Telephone: 213-473-7869
Date Made Active in Reports: 08/10/2015	Last EDR Contact: 07/20/2015
Number of Days to Update: 14	Next Scheduled EDR Contact: 11/02/2015
	Data Release Frequency: Varies

## Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/15/2015	Source: Community Health Services
Date Data Arrived at EDR: 01/29/2015	Telephone: 323-890-7806
Date Made Active in Reports: 03/10/2015	Last EDR Contact: 07/15/2015
Number of Days to Update: 40	Next Scheduled EDR Contact: 11/02/2015
	Data Release Frequency: Annually

## City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 03/30/2015	Source: City of El Segundo Fire Department
Date Data Arrived at EDR: 04/02/2015	Telephone: 310-524-2236
Date Made Active in Reports: 04/13/2015	Last EDR Contact: 07/17/2015
Number of Days to Update: 11	Next Scheduled EDR Contact: 11/02/2015
	Data Release Frequency: Semi-Annually

## City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/03/2015	Source: City of Long Beach Fire Department
Date Data Arrived at EDR: 05/26/2015	Telephone: 562-570-2563
Date Made Active in Reports: 06/11/2015	Last EDR Contact: 07/27/2015
Number of Days to Update: 16	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Annually

## City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/03/2015	Source: City of Torrance Fire Department
Date Data Arrived at EDR: 06/04/2015	Telephone: 310-618-2973
Date Made Active in Reports: 07/06/2015	Last EDR Contact: 06/04/2015
Number of Days to Update: 32	Next Scheduled EDR Contact: 10/28/2015
	Data Release Frequency: Semi-Annually

MADERA COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2015  
Date Data Arrived at EDR: 05/29/2015  
Date Made Active in Reports: 06/15/2015  
Number of Days to Update: 17

Source: Madera County Environmental Health  
Telephone: 559-675-7823  
Last EDR Contact: 05/22/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## MARIN COUNTY:

### Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 10/08/2014  
Date Data Arrived at EDR: 10/22/2014  
Date Made Active in Reports: 12/15/2014  
Number of Days to Update: 54

Source: Public Works Department Waste Management  
Telephone: 415-499-6647  
Last EDR Contact: 07/06/2015  
Next Scheduled EDR Contact: 10/19/2015  
Data Release Frequency: Semi-Annually

## MERCED COUNTY:

### CUPA Facility List

CUPA facility list.

Date of Government Version: 05/22/2015  
Date Data Arrived at EDR: 05/26/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 30

Source: Merced County Environmental Health  
Telephone: 209-381-1094  
Last EDR Contact: 05/22/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## MONO COUNTY:

### CUPA Facility List

CUPA Facility List

Date of Government Version: 06/01/2015  
Date Data Arrived at EDR: 06/03/2015  
Date Made Active in Reports: 07/06/2015  
Number of Days to Update: 33

Source: Mono County Health Department  
Telephone: 760-932-5580  
Last EDR Contact: 06/01/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: Varies

## MONTEREY COUNTY:

### CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/30/2015  
Date Data Arrived at EDR: 07/07/2015  
Date Made Active in Reports: 07/16/2015  
Number of Days to Update: 9

Source: Monterey County Health Department  
Telephone: 831-796-1297  
Last EDR Contact: 05/26/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## NAPA COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## Sites With Reported Contamination

A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011  
Date Data Arrived at EDR: 12/06/2011  
Date Made Active in Reports: 02/07/2012  
Number of Days to Update: 63

Source: Napa County Department of Environmental Management  
Telephone: 707-253-4269  
Last EDR Contact: 06/01/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: No Update Planned

## Closed and Operating Underground Storage Tank Sites

Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008  
Date Data Arrived at EDR: 01/16/2008  
Date Made Active in Reports: 02/08/2008  
Number of Days to Update: 23

Source: Napa County Department of Environmental Management  
Telephone: 707-253-4269  
Last EDR Contact: 06/01/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: No Update Planned

## NEVADA COUNTY:

### CUPA Facility List

CUPA facility list.

Date of Government Version: 06/03/2015  
Date Data Arrived at EDR: 06/04/2015  
Date Made Active in Reports: 07/22/2015  
Number of Days to Update: 48

Source: Community Development Agency  
Telephone: 530-265-1467  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Varies

## ORANGE COUNTY:

### List of Industrial Site Cleanups

Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2015  
Date Data Arrived at EDR: 05/12/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 24

Source: Health Care Agency  
Telephone: 714-834-3446  
Last EDR Contact: 08/06/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Annually

### List of Underground Storage Tank Cleanups

Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2015  
Date Data Arrived at EDR: 05/12/2015  
Date Made Active in Reports: 06/08/2015  
Number of Days to Update: 27

Source: Health Care Agency  
Telephone: 714-834-3446  
Last EDR Contact: 05/06/2015  
Next Scheduled EDR Contact: 08/24/2015  
Data Release Frequency: Quarterly

### List of Underground Storage Tank Facilities

Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/01/2015  
Date Data Arrived at EDR: 05/12/2015  
Date Made Active in Reports: 06/11/2015  
Number of Days to Update: 30

Source: Health Care Agency  
Telephone: 714-834-3446  
Last EDR Contact: 08/11/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Quarterly

## PLACER COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 07/01/2015  
Date Data Arrived at EDR: 07/07/2015  
Date Made Active in Reports: 08/05/2015  
Number of Days to Update: 29

Source: Placer County Health and Human Services  
Telephone: 530-745-2363  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Semi-Annually

## RIVERSIDE COUNTY:

### Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/15/2015  
Date Data Arrived at EDR: 07/17/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 17

Source: Department of Environmental Health  
Telephone: 951-358-5055  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: Quarterly

### Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 07/15/2015  
Date Data Arrived at EDR: 07/17/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 17

Source: Department of Environmental Health  
Telephone: 951-358-5055  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: Quarterly

## SACRAMENTO COUNTY:

### Toxic Site Clean-Up List

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/07/2015  
Date Data Arrived at EDR: 07/24/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 10

Source: Sacramento County Environmental Management  
Telephone: 916-875-8406  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 10/19/2015  
Data Release Frequency: Quarterly

### Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/07/2015  
Date Data Arrived at EDR: 07/27/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 7

Source: Sacramento County Environmental Management  
Telephone: 916-875-8406  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 10/19/2015  
Data Release Frequency: Quarterly

## SAN BERNARDINO COUNTY:

### Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/30/2015  
Date Data Arrived at EDR: 07/07/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 7

Source: San Bernardino County Fire Department Hazardous Materials Division  
Telephone: 909-387-3041  
Last EDR Contact: 08/10/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Quarterly

## SAN DIEGO COUNTY:

### Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013  
Date Data Arrived at EDR: 09/24/2013  
Date Made Active in Reports: 10/17/2013  
Number of Days to Update: 23

Source: Hazardous Materials Management Division  
Telephone: 619-338-2268  
Last EDR Contact: 06/05/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Quarterly

### Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2014  
Date Data Arrived at EDR: 11/21/2014  
Date Made Active in Reports: 12/29/2014  
Number of Days to Update: 38

Source: Department of Health Services  
Telephone: 619-338-2209  
Last EDR Contact: 07/22/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

### Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010  
Date Data Arrived at EDR: 06/15/2010  
Date Made Active in Reports: 07/09/2010  
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health  
Telephone: 619-338-2371  
Last EDR Contact: 06/03/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: No Update Planned

## SAN FRANCISCO COUNTY:

### Local Oversight Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008  
Date Data Arrived at EDR: 09/19/2008  
Date Made Active in Reports: 09/29/2008  
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County  
Telephone: 415-252-3920  
Last EDR Contact: 08/06/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Quarterly

### Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010  
Date Data Arrived at EDR: 03/10/2011  
Date Made Active in Reports: 03/15/2011  
Number of Days to Update: 5

Source: Department of Public Health  
Telephone: 415-252-3920  
Last EDR Contact: 08/06/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Quarterly

## SAN JOAQUIN COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## San Joaquin Co. UST

A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2015  
Date Data Arrived at EDR: 06/26/2015  
Date Made Active in Reports: 07/06/2015  
Number of Days to Update: 10

Source: Environmental Health Department  
Telephone: N/A  
Last EDR Contact: 06/17/2015  
Next Scheduled EDR Contact: 10/05/2015  
Data Release Frequency: Semi-Annually

## SAN LUIS OBISPO COUNTY:

### CUPA Facility List

Cupa Facility List.

Date of Government Version: 05/22/2015  
Date Data Arrived at EDR: 05/26/2015  
Date Made Active in Reports: 06/10/2015  
Number of Days to Update: 15

Source: San Luis Obispo County Public Health Department  
Telephone: 805-781-5596  
Last EDR Contact: 05/20/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## SAN MATEO COUNTY:

### Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 07/20/2015  
Date Data Arrived at EDR: 07/22/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 12

Source: San Mateo County Environmental Health Services Division  
Telephone: 650-363-1921  
Last EDR Contact: 06/15/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Annually

### Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 06/10/2015  
Date Data Arrived at EDR: 06/16/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 28

Source: San Mateo County Environmental Health Services Division  
Telephone: 650-363-1921  
Last EDR Contact: 06/10/2015  
Next Scheduled EDR Contact: 06/29/2015  
Data Release Frequency: Semi-Annually

## SANTA BARBARA COUNTY:

### CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011  
Date Data Arrived at EDR: 09/09/2011  
Date Made Active in Reports: 10/07/2011  
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department  
Telephone: 805-686-8167  
Last EDR Contact: 05/22/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## SANTA CLARA COUNTY:

### Cupa Facility List

Cupa facility list



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/10/2015  
Date Data Arrived at EDR: 06/16/2015  
Date Made Active in Reports: 07/10/2015  
Number of Days to Update: 24

Source: Department of Environmental Health  
Telephone: 408-918-1973  
Last EDR Contact: 06/05/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005  
Date Data Arrived at EDR: 03/30/2005  
Date Made Active in Reports: 04/21/2005  
Number of Days to Update: 22

Source: Santa Clara Valley Water District  
Telephone: 408-265-2600  
Last EDR Contact: 03/23/2009  
Next Scheduled EDR Contact: 06/22/2009  
Data Release Frequency: No Update Planned

## LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014  
Date Data Arrived at EDR: 03/05/2014  
Date Made Active in Reports: 03/18/2014  
Number of Days to Update: 13

Source: Department of Environmental Health  
Telephone: 408-918-3417  
Last EDR Contact: 06/01/2015  
Next Scheduled EDR Contact: 09/14/2015  
Data Release Frequency: Annually

## Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/07/2015  
Date Data Arrived at EDR: 05/12/2015  
Date Made Active in Reports: 06/08/2015  
Number of Days to Update: 27

Source: City of San Jose Fire Department  
Telephone: 408-535-7694  
Last EDR Contact: 08/07/2015  
Next Scheduled EDR Contact: 11/23/2015  
Data Release Frequency: Annually

## SANTA CRUZ COUNTY:

### CUPA Facility List

CUPA facility listing.

Date of Government Version: 05/22/2015  
Date Data Arrived at EDR: 05/26/2015  
Date Made Active in Reports: 06/08/2015  
Number of Days to Update: 13

Source: Santa Cruz County Environmental Health  
Telephone: 831-464-2761  
Last EDR Contact: 05/22/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## SHASTA COUNTY:

### CUPA Facility List

Cupa Facility List.

Date of Government Version: 06/12/2015  
Date Data Arrived at EDR: 06/16/2015  
Date Made Active in Reports: 07/10/2015  
Number of Days to Update: 24

Source: Shasta County Department of Resource Management  
Telephone: 530-225-5789  
Last EDR Contact: 05/26/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Varies

## SOLANO COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2015  
Date Data Arrived at EDR: 06/24/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 20

Source: Solano County Department of Environmental Management  
Telephone: 707-784-6770  
Last EDR Contact: 06/10/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

## Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2015  
Date Data Arrived at EDR: 06/30/2015  
Date Made Active in Reports: 07/07/2015  
Number of Days to Update: 7

Source: Solano County Department of Environmental Management  
Telephone: 707-784-6770  
Last EDR Contact: 06/10/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Quarterly

## SONOMA COUNTY:

### Cupa Facility List

Cupa Facility list

Date of Government Version: 06/22/2015  
Date Data Arrived at EDR: 06/26/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 18

Source: County of Sonoma Fire & Emergency Services Department  
Telephone: 707-565-1174  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Varies

## Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/01/2015  
Date Data Arrived at EDR: 07/07/2015  
Date Made Active in Reports: 07/14/2015  
Number of Days to Update: 7

Source: Department of Health Services  
Telephone: 707-565-6565  
Last EDR Contact: 06/22/2015  
Next Scheduled EDR Contact: 10/12/2015  
Data Release Frequency: Quarterly

## SUTTER COUNTY:

### Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 06/05/2015  
Date Data Arrived at EDR: 06/09/2015  
Date Made Active in Reports: 07/06/2015  
Number of Days to Update: 27

Source: Sutter County Department of Agriculture  
Telephone: 530-822-7500  
Last EDR Contact: 06/05/2015  
Next Scheduled EDR Contact: 09/21/2015  
Data Release Frequency: Semi-Annually

## TUOLUMNE COUNTY:

### CUPA Facility List

Cupa facility list

Date of Government Version: 07/13/2015  
Date Data Arrived at EDR: 07/28/2015  
Date Made Active in Reports: 08/03/2015  
Number of Days to Update: 6

Source: Division of Environmental Health  
Telephone: 209-533-5633  
Last EDR Contact: 07/24/2015  
Next Scheduled EDR Contact: 11/09/2015  
Data Release Frequency: Varies

## VENTURA COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 06/26/2015	Source: Ventura County Environmental Health Division
Date Data Arrived at EDR: 07/17/2015	Telephone: 805-654-2813
Date Made Active in Reports: 08/03/2015	Last EDR Contact: 08/12/2015
Number of Days to Update: 17	Next Scheduled EDR Contact: 11/30/2015
	Data Release Frequency: Quarterly

## Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011	Source: Environmental Health Division
Date Data Arrived at EDR: 12/01/2011	Telephone: 805-654-2813
Date Made Active in Reports: 01/19/2012	Last EDR Contact: 06/26/2015
Number of Days to Update: 49	Next Scheduled EDR Contact: 10/19/2015
	Data Release Frequency: Annually

## Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008	Source: Environmental Health Division
Date Data Arrived at EDR: 06/24/2008	Telephone: 805-654-2813
Date Made Active in Reports: 07/31/2008	Last EDR Contact: 08/12/2015
Number of Days to Update: 37	Next Scheduled EDR Contact: 11/30/2015
	Data Release Frequency: Quarterly

## Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 04/27/2015	Source: Ventura County Resource Management Agency
Date Data Arrived at EDR: 04/29/2015	Telephone: 805-654-2813
Date Made Active in Reports: 05/13/2015	Last EDR Contact: 07/27/2015
Number of Days to Update: 14	Next Scheduled EDR Contact: 11/09/2015
	Data Release Frequency: Quarterly

## Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 05/27/2015	Source: Environmental Health Division
Date Data Arrived at EDR: 06/17/2015	Telephone: 805-654-2813
Date Made Active in Reports: 07/06/2015	Last EDR Contact: 06/17/2015
Number of Days to Update: 19	Next Scheduled EDR Contact: 09/28/2015
	Data Release Frequency: Quarterly

## YOLO COUNTY:

### Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 07/08/2015	Source: Yolo County Department of Health
Date Data Arrived at EDR: 07/13/2015	Telephone: 530-666-8646
Date Made Active in Reports: 07/22/2015	Last EDR Contact: 07/06/2015
Number of Days to Update: 9	Next Scheduled EDR Contact: 10/05/2015
	Data Release Frequency: Annually

## YUBA COUNTY:

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 05/18/2015  
Date Data Arrived at EDR: 05/19/2015  
Date Made Active in Reports: 06/05/2015  
Number of Days to Update: 17

Source: Yuba County Environmental Health Department  
Telephone: 530-749-7523  
Last EDR Contact: 07/31/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Varies

## OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

### CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013  
Date Data Arrived at EDR: 08/19/2013  
Date Made Active in Reports: 10/03/2013  
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3375  
Last EDR Contact: 05/18/2015  
Next Scheduled EDR Contact: 08/31/2015  
Data Release Frequency: No Update Planned

### NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 07/17/2015  
Date Made Active in Reports: 08/12/2015  
Number of Days to Update: 26

Source: Department of Environmental Protection  
Telephone: N/A  
Last EDR Contact: 07/13/2015  
Next Scheduled EDR Contact: 10/28/2015  
Data Release Frequency: Annually

### NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 08/01/2015  
Date Data Arrived at EDR: 08/06/2015  
Date Made Active in Reports: 08/24/2015  
Number of Days to Update: 18

Source: Department of Environmental Conservation  
Telephone: 518-402-8651  
Last EDR Contact: 08/06/2015  
Next Scheduled EDR Contact: 11/16/2015  
Data Release Frequency: Annually

### PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 07/24/2015  
Date Made Active in Reports: 08/18/2015  
Number of Days to Update: 25

Source: Department of Environmental Protection  
Telephone: 717-783-8990  
Last EDR Contact: 07/20/2015  
Next Scheduled EDR Contact: 11/02/2015  
Data Release Frequency: Annually

### RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 06/19/2015  
Date Made Active in Reports: 07/15/2015  
Number of Days to Update: 26

Source: Department of Environmental Management  
Telephone: 401-222-2797  
Last EDR Contact: 05/26/2015  
Next Scheduled EDR Contact: 09/07/2015  
Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 03/19/2015  
Date Made Active in Reports: 04/07/2015  
Number of Days to Update: 19

Source: Department of Natural Resources  
Telephone: N/A  
Last EDR Contact: 06/11/2015  
Next Scheduled EDR Contact: 09/28/2015  
Data Release Frequency: Annually

## Oil/Gas Pipelines

Source: PennWell Corporation

Telephone: 281-546-1505

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

## Electric Power Transmission Line Data

Source: PennWell Corporation

Telephone: 800-823-6277

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

## AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

## Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

## Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

## Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

## Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

## Daycare Centers: Licensed Facilities

Source: Department of Social Services

Telephone: 916-657-4041

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Current USGS 7.5 Minute Topographic Map  
Source: U.S. Geological Survey

### **STREET AND ADDRESS INFORMATION**

© 2010 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.

## GEOCHECK<sup>®</sup> - PHYSICAL SETTING SOURCE ADDENDUM

### TARGET PROPERTY ADDRESS

BUENA VISTA PALMS  
BVWSD  
BUTTONWILLOW, CA 93206

### TARGET PROPERTY COORDINATES

Latitude (North): 35.3204 - 35° 19' 13.44"  
Longitude (West): 119.3826 - 119° 22' 57.36"  
Universal Tranverse Mercator: Zone 11  
UTM X (Meters): 283408.8  
UTM Y (Meters): 3910981.2  
Elevation: 288 ft. above sea level

### USGS TOPOGRAPHIC MAP

Target Property Map: 5639479 EAST ELK HILLS, CA  
Version Date: 2012  
  
East Map: 5639513 TUPMAN, CA  
Version Date: 2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

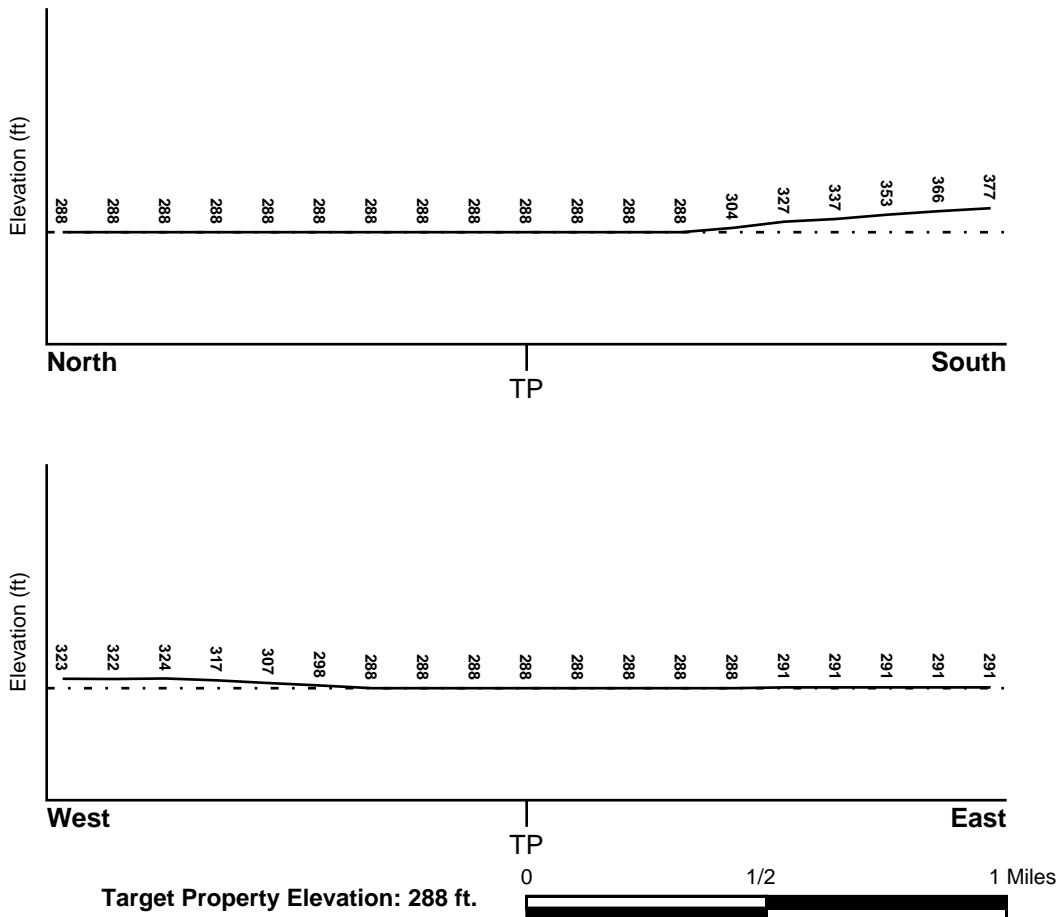
## TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

## TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General East

## SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.



# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

## FEMA FLOOD ZONE

Target Property County  
KERN, CA

FEMA Flood Electronic Data  
YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 06029C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

## NATIONAL WETLAND INVENTORY

NWI Quad at Target Property  
EAST ELK HILLS

NWI Electronic Data Coverage  
YES - refer to the Overview Map and Detail Map

## HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

### *Site-Specific Hydrogeological Data\*:*

Search Radius: 1.25 miles  
Status: Not found

## AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
Not Reported		

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

### GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

#### **ROCK STRATIGRAPHIC UNIT**

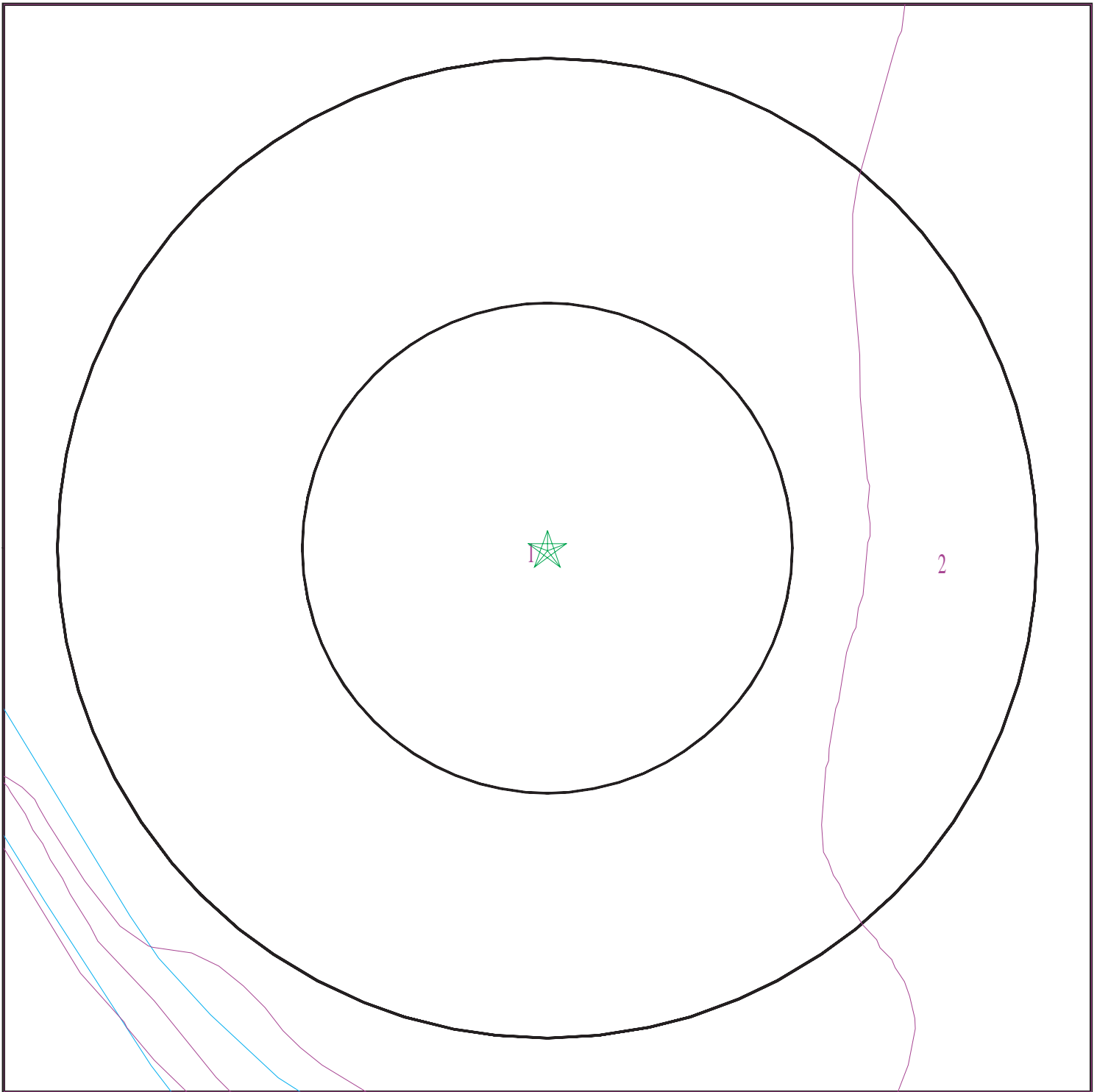
Era: Cenozoic  
System: Quaternary  
Series: Quaternary  
Code: Q (*decoded above as Era, System & Series*)

#### **GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 4394757.2s



- ★ Target Property
- ∩ SSURGO Soil
- ∩ Water



SITE NAME: Buena Vista Palms  
ADDRESS: BVWSD  
Buttonwillow CA 93206  
LAT/LONG: 35.3204 / 119.3826

CLIENT: GEI Consultants  
CONTACT: Stephanie  
INQUIRY #: 4394757.2s  
DATE: August 26, 2015 5:25 pm

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

### Soil Map ID: 1

Soil Component Name:                    BUTTONWILLOW

Soil Surface Texture:  
Hydrologic Group:                    Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class:                    Moderately well drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min:                > 0 inches

Depth to Watertable Min:            > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	27 inches		Not reported	Not reported	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9
2	27 inches	55 inches		Not reported	Not reported	Max: 42 Min: 14	Max: 8.4 Min: 7.9
3	55 inches	64 inches		Not reported	Not reported	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9

### Soil Map ID: 2

Soil Component Name:                    LOKERN

Soil Surface Texture:  
Hydrologic Group:                    Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class:                    Moderately well drained

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	7 inches		Not reported	Not reported	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9
2	7 inches	48 inches		Not reported	Not reported	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9
3	48 inches	66 inches		Not reported	Not reported	Max: 14 Min: 4	Max: 8.4 Min: 7.9

## LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

## WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

## FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
1	USGS40000162704	1/4 - 1/2 Mile SE
4	USGS40000162830	1/2 - 1 Mile NW
5	USGS40000162792	1/2 - 1 Mile WNW
6	USGS40000162732	1/2 - 1 Mile ESE
7	USGS40000162754	1/2 - 1 Mile East
8	USGS40000162601	1/2 - 1 Mile SSE
9	USGS40000162831	1/2 - 1 Mile WNW
10	USGS40000162916	1/2 - 1 Mile NNE
11	USGS40000162938	1/2 - 1 Mile NNW
B13	USGS40000162649	1/2 - 1 Mile ESE

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
14	USGS40000162532	1/2 - 1 Mile South

## FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No PWS System Found		

Note: PWS System location is not always the same as well location.

## STATE DATABASE WELL INFORMATION

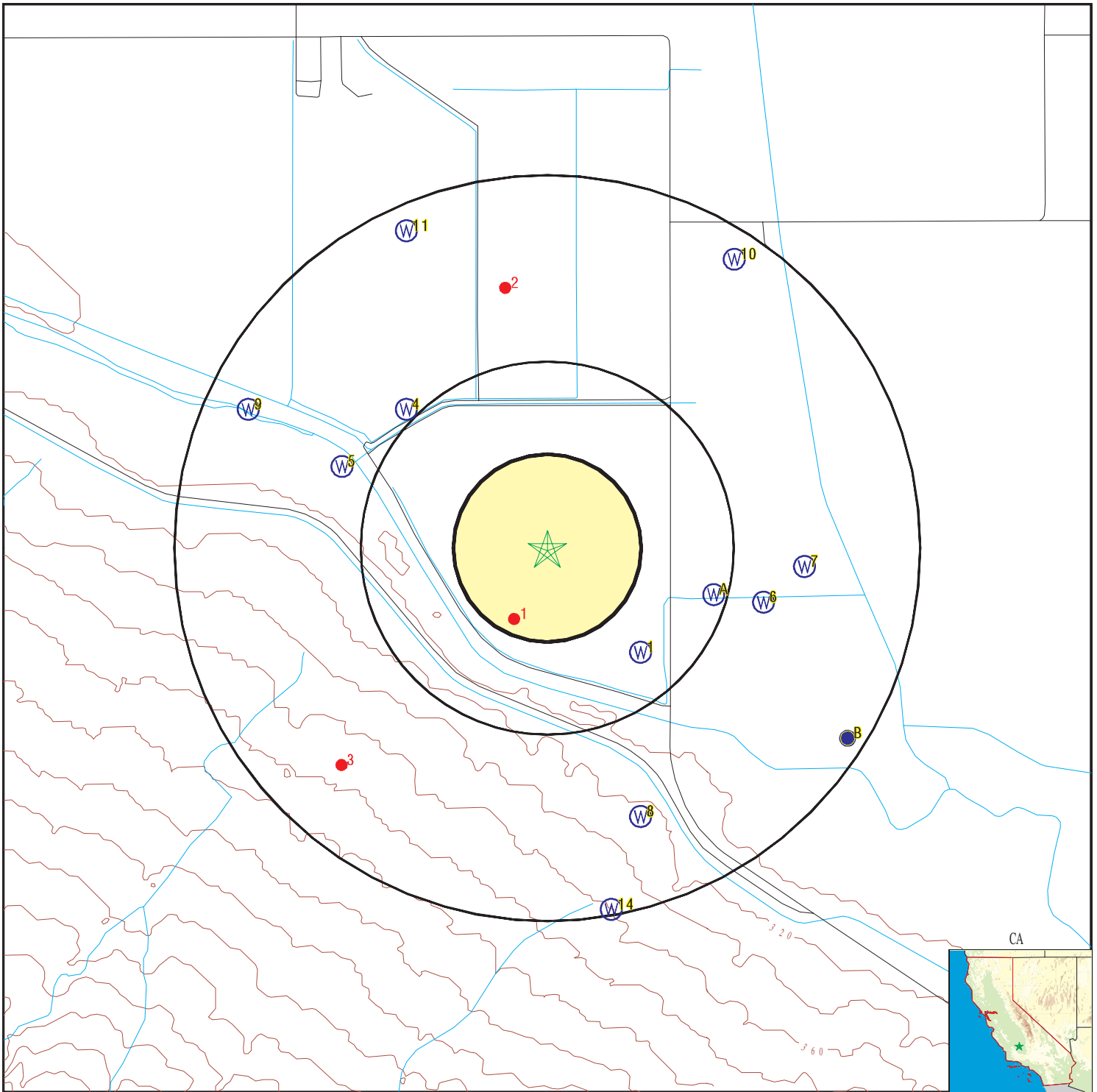
<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
A2	CADW60000015105	1/4 - 1/2 Mile ESE
A3	CADW60000005539	1/4 - 1/2 Mile ESE
B12	CADW60000031013	1/2 - 1 Mile ESE

## OTHER STATE DATABASE INFORMATION

## STATE OIL/GAS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
1	CAOG11000047015	1/8 - 1/4 Mile SSW
2	CAOG11000073221	1/2 - 1 Mile North
3	CAOG11000039217	1/2 - 1 Mile SW

# PHYSICAL SETTING SOURCE MAP - 4394757.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data
- Oil, gas or related wells



SITE NAME: Buena Vista Palms  
 ADDRESS: BVWSD  
 Buttonwillow CA 93206  
 LAT/LONG: 35.3204 / 119.3826

CLIENT: GEI Consultants  
 CONTACT: Stephanie  
 INQUIRY #: 4394757.2s  
 DATE: August 26, 2015 5:25 pm

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Elevation

Database      EDR ID Number

**1**  
**SE**  
**1/4 - 1/2 Mile**  
**Higher**      **FED USGS**      **USGS40000162704**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351859119223801		
Monloc name:	030S024E15J001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3163515
Longitude:	-119.37817	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	287.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1954	Welldepth:	504
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----		
1961-02-19	51.00	

**A2**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**      **CA WELLS**      **CADW60000015105**

Objectid:	15105
Latitude:	35.31871
Longitude:	-119.374709
Site code:	353187N1193747W001
State well numbe:	30S24E14M003M
Local well name:	'DMW12b'
Well use id:	1
Well use descrip:	Observation
County id:	15
County name:	Kern
Basin code:	'5-22.14'
Basin desc:	Kern County
Dwr region id:	80237
Dwr region:	South Central Region Office
Site id:	CADW60000015105



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Elevation

Database      EDR ID Number

**A3**  
**ESE**  
**1/4 - 1/2 Mile**  
**Higher**

**CA WELLS      CADW60000005539**

Objectid:                    5539  
 Latitude:                    35.31847  
 Longitude:                  -119.374694  
 Site code:                    353185N1193747W001  
 State well numbe:         30S24E14M002M  
 Local well name:          'DMW12a'  
 Well use id:                  1  
 Well use descrip:          Observation  
 County id:                    15  
 County name:                Kern  
 Basin code:                  '5-22.14'  
 Basin desc:                  Kern County  
 Dwr region id:              80237  
 Dwr region:                 South Central Region Office  
 Site id:                        CADW60000005539

**4**  
**NW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS      USGS40000162830**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351933119231801		
Monloc name:	031S024E10P002M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3257958
Longitude:	-119.3892815	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	300.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

**5**  
**WNW**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS      USGS40000162792**

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351925119232901		
Monloc name:	030S024E15D001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3235737
Longitude:	-119.3923372	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1954	Welldepth:	502
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

**6**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS      USGS40000162732**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351906119221701		
Monloc name:	030S024E14F001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3182959
Longitude:	-119.3723365	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	291.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1933	Welldepth:	593
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1960-10-04	35.00	

**7**

**East  
1/2 - 1 Mile  
Higher**

**FED USGS**

**USGS40000162754**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351911119221001		
Monloc name:	030S014E14F001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3196848
Longitude:	-119.370392	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	287.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1961-02-19	48.00	

**8**

**SSE  
1/2 - 1 Mile  
Higher**

**FED USGS**

**USGS40000162601**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351836119223801		
Monloc name:	031S014E22A001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3099628
Longitude:	-119.37817	Sourcemap scale:	63360

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	310.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	80
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

**9**  
**WNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS      USGS40000162831**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351933119234501		
Monloc name:	030S024E09R001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3257959
Longitude:	-119.3967818	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	285.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1957	Welldepth:	522
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----	-----	-----
1961-02-20	70.00	

**10**  
**NNE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS      USGS40000162916**

## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351954119222201		
Monloc name:	030S024E11L001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.331629
Longitude:	-119.3737254	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	488.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

**11**  
**NNW**  
**1/2 - 1 Mile**  
**Lower**

**FED USGS      USGS40000162938**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351958119231801		
Monloc name:	030S024E10F001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3327402
Longitude:	-119.3892815	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	286.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Elevation

Database      EDR ID Number

**B12**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**CA WELLS      CADW60000031013**

Objectid:                    31013  
 Latitude:                    35.313  
 Longitude:                  -119.3688  
 Site code:                    353130N1193688W001  
 State well numbe:        30S24E14Q001M  
 Local well name:         'Anton'  
 Well use id:                 6  
 Well use descrip:         Unknown  
 County id:                    15  
 County name:                Kern  
 Basin code:                 '5-22.14'  
 Basin desc:                 Kern County  
 Dwr region id:             80237  
 Dwr region:                South Central Region Office  
 Site id:                      CADW60000031013

**B13**  
**ESE**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS      USGS40000162649**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351847119220101		
Monloc name:	030S024E14Q001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3130182
Longitude:	-119.3678919	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	290.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1955	Welldepth:	672
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----		
1960-10-03	57.00	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Elevation

Database      EDR ID Number

**14**  
**South**  
**1/2 - 1 Mile**  
**Higher**

**FED USGS      USGS40000162532**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-351823119224301		
Monloc name:	030S024E22H001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18030012	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	35.3063518
Longitude:	-119.379559	Sourcemap scale:	63360
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	335.00
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Central Valley aquifer system		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1955	Welldepth:	548
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
-----		
1961-02-19	97.00	

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID  
Direction  
Distance

Database      EDR ID Number

**1**

**SSW**

**OIL\_GAS**

**CAOG11000047015**

**1/8 - 1/4 Mile**

District nun:	4	Api number:	02937474
Blm well:	N	Redrill can:	Not Reported
Dryhole:	Y	Well status:	P
Operator name:	E. A. Bender, Operator		
County name:	Kern	Fieldname:	Any Field
Area name:	Any Area	Section:	15
Township:	30S	Range:	24E
Base meridian:	MD	Elevation:	299 KB
Locationde:	Fr ctr 330S 330E		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Palm Farms	Wellnumber:	55
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0		
Redrillfoo:	0		
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Unknown	Gissymbol:	PDH
Site id:	CAOG11000047015		

**2**

**North**

**OIL\_GAS**

**CAOG11000073221**

**1/2 - 1 Mile**

District nun:	4	Api number:	02952932
Blm well:	N	Redrill can:	Not Reported
Dryhole:	Y	Well status:	P
Operator name:	Quintana Production Co.		
County name:	Kern	Fieldname:	Any Field
Area name:	Any Area	Section:	10
Township:	30S	Range:	24E
Base meridian:	MD	Elevation:	286 MAT
Locationde:	Fr SE cor 1750N 2450W		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Union-Gamay	Wellnumber:	56X-10
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0		
Redrillfoo:	0		
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Unknown	Gissymbol:	PDH
Site id:	CAOG11000073221		

**3**

**SW**

**OIL\_GAS**

**CAOG11000039217**

**1/2 - 1 Mile**



## GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

District nun:	4	Api number:	02929611
Blm well:	N	Redrill can:	Not Reported
Dryhole:	Y	Well status:	P
Operator name:	Section 15 Oil Co.		
County name:	Kern	Fieldname:	Any Field
Area name:	Any Area	Section:	15
Township:	30S	Range:	24E
Base meridian:	MD	Elevation:	Not Reported
Locationde:	Fr SW cor 250N 660E		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Not Reported	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0		
Redrillfoo:	0		
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Unknown	Gissymbol:	PDH
Site id:	CAOG11000039217		

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

## AREA RADON INFORMATION

State Database: CA Radon

### Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
93206	1	0

Federal EPA Radon Zone for KERN County: 2

- Note: Zone 1 indoor average level > 4 pCi/L.  
 : Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.  
 : Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for Zip Code: 93206

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.900 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

### USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

### Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

### AQUIFLOW<sup>R</sup> Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

### Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

### STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

### SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

### FEDERAL WATER WELLS

#### PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

#### PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

#### USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

### STATE RECORDS

#### Water Well Database

Source: Department of Water Resources

Telephone: 916-651-9648

#### California Drinking Water Quality Database

Source: Department of Public Health

Telephone: 916-324-2319

The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

## OTHER STATE DATABASE INFORMATION

#### California Oil and Gas Well Locations

Source: Department of Conservation

Telephone: 916-323-1779

Oil and Gas well locations in the state.

### RADON

#### State Database: CA Radon

Source: Department of Health Services

Telephone: 916-324-2208

Radon Database for California

#### Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

#### EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

## PHYSICAL SETTING SOURCE RECORDS SEARCHED

### OTHER

Airport Landing Facilities: Private and public use landing facilities  
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater  
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

### STREET AND ADDRESS INFORMATION

© 2010 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.



**Buena Vista Palms**

BVWSD

Buttonwillow, CA 93206

Inquiry Number: 4394757.3

August 26, 2015

## Certified Sanborn® Map Report



6 Armstrong Road, 4th Floor  
Shelton, Connecticut 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

# Certified Sanborn® Map Report

8/26/15

**Site Name:**

Buena Vista Palms  
BVWSD  
Buttonwillow, CA 93206

**Client Name:**

GEI Consultants  
700 NE Multnomah Street,  
Portland, OR 97232



EDR Inquiry # 4394757.3

Contact: Stephanie

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by GEI Consultants were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting [www.edrnet.com/sanborn](http://www.edrnet.com/sanborn).

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## Certified Sanborn Results:

**Site Name:** Buena Vista Palms  
**Address:** BVWSD  
**City, State, Zip:** Buttonwillow, CA 93206  
**Cross Street:**  
**P.O. #** NA  
**Project:** BVWSD Palms  
**Certification #** 571A-4CC3-B373



Sanborn® Library search results  
Certification # 571A-4CC3-B373

## UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- Library of Congress
- University Publications of America
- EDR Private Collection

*The Sanborn Library LLC Since 1866™*

## Limited Permission To Make Copies

GEI Consultants (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

### Disclaimer - Copyright and Trademark notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2015 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.



**Buena Vista Palms**

BVWSD

Buttonwillow, CA 93206

Inquiry Number: 4394757.4

August 26, 2015

# EDR Historical Topographic Map Report



6 Armstrong Road, 4th Floor  
Shelton, Connecticut 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)



# EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

***Thank you for your business.***  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

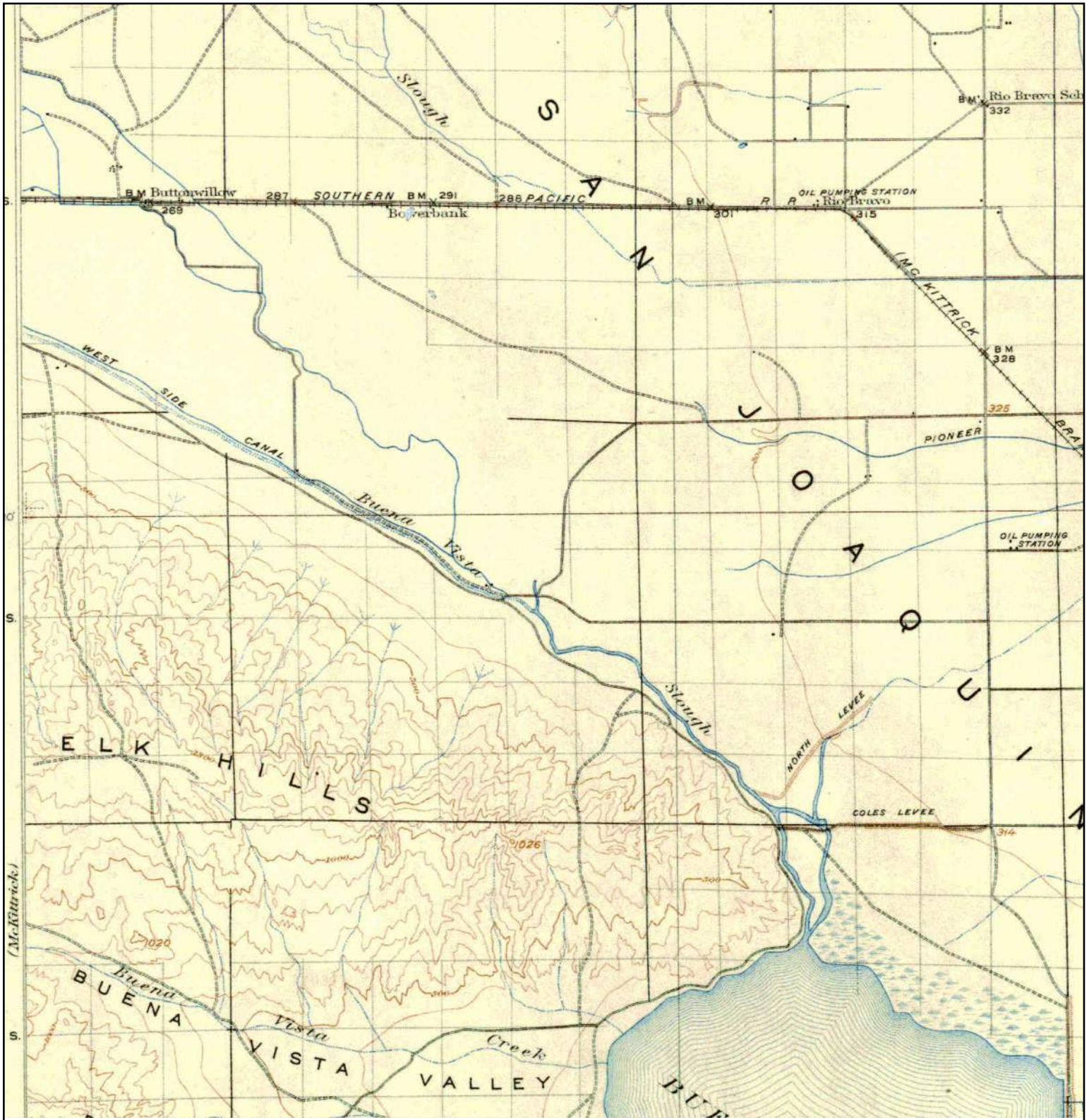
## **Disclaimer - Copyright and Trademark Notice**


This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2015 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

# Historical Topographic Map



	<b>TARGET QUAD</b> NAME: BUENA VISTA LAKE MAP YEAR: 1912	SITE NAME: Buena Vista Palms ADDRESS: BVWSD Buttonwillow, CA 93206 LAT/LONG: 35.3204 / -119.3826	CLIENT: GEI Consultants CONTACT: Stephanie INQUIRY#: 4394757.4 RESEARCH DATE: 08/26/2015
	SERIES: 30 SCALE: 1:125000		



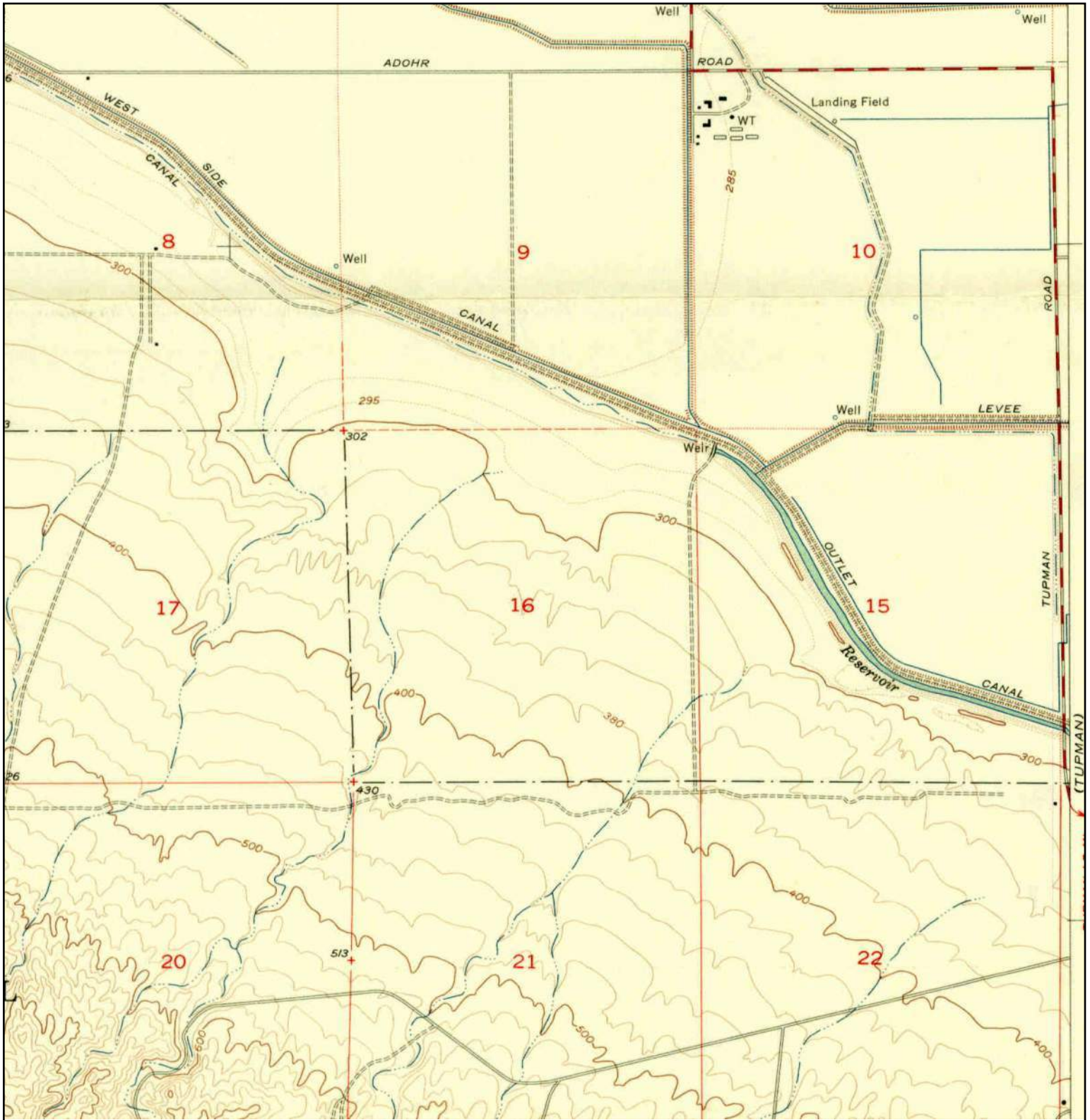
# Historical Topographic Map



	<b>TARGET QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	NAME: EAST ELK HILLS	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	MAP YEAR: 1932	Buttonwillow, CA 93206	<b>INQUIRY#:</b> 4394757.4
	SERIES: 7.5	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	SCALE: 1:31680		



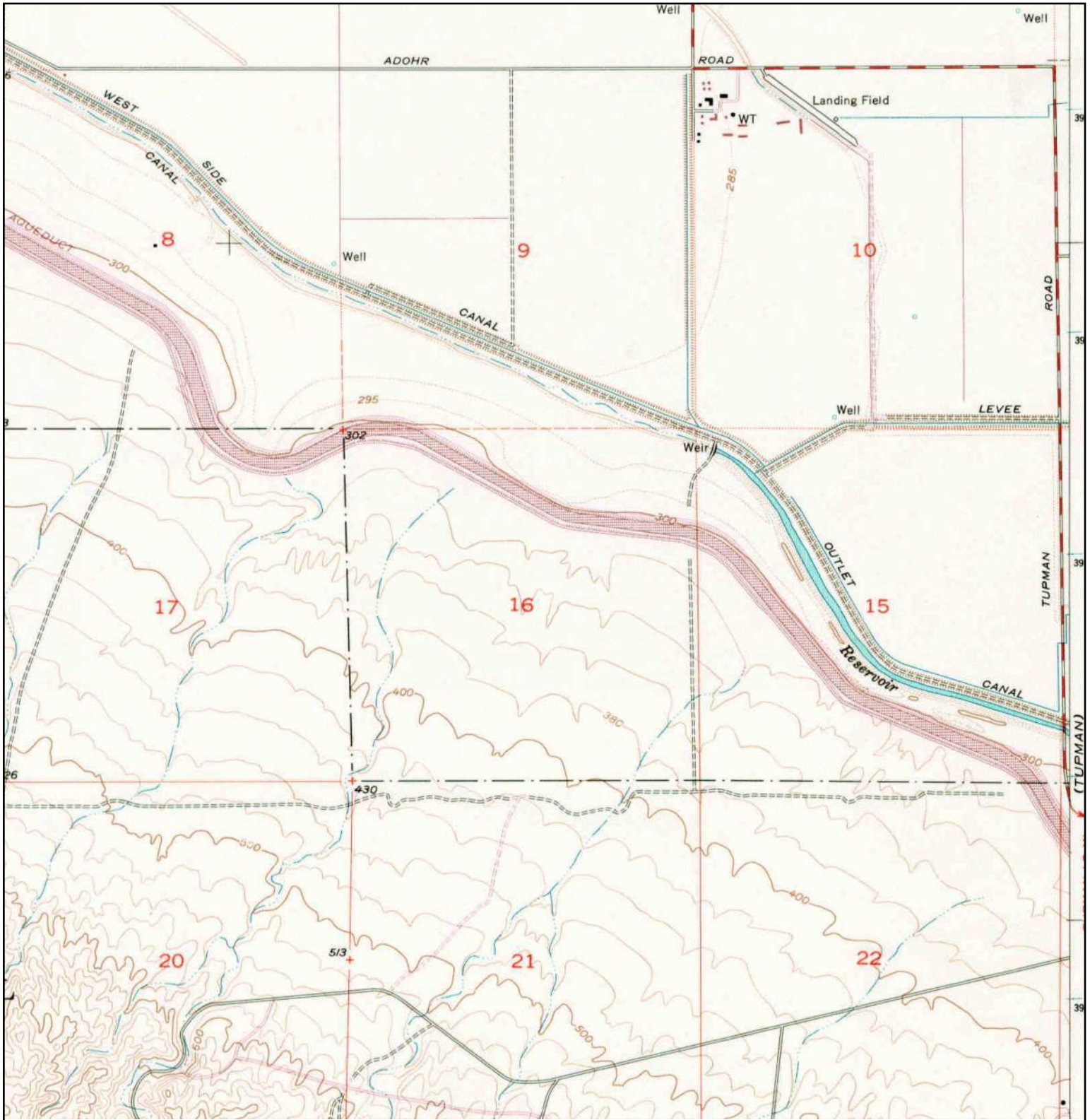
# Historical Topographic Map



	<b>TARGET QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	NAME: EAST ELK HILLS	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	MAP YEAR: 1954	Buttonwillow, CA 93206	<b>INQUIRY#:</b> 4394757.4
	SERIES: 7.5	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	SCALE: 1:24000		



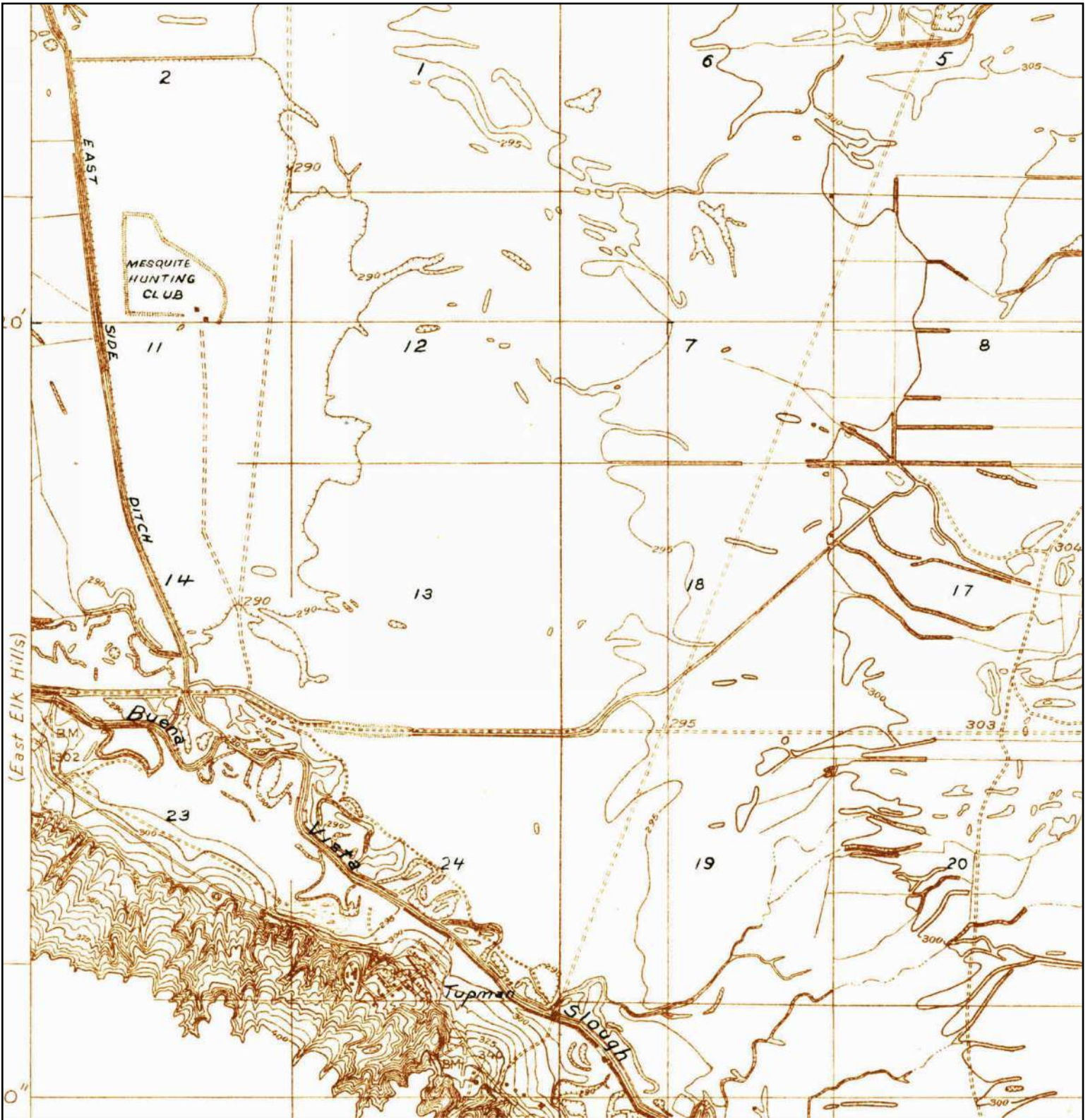
# Historical Topographic Map




<p>N ↑</p>	<b>TARGET QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	NAME: EAST ELK HILLS	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	MAP YEAR: 1973	Buttonwillow, CA 93206	<b>INQUIRY#:</b> 4394757.4
	PHOTOREVISED FROM :1954	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	SERIES: 7.5		
	SCALE: 1:24000		



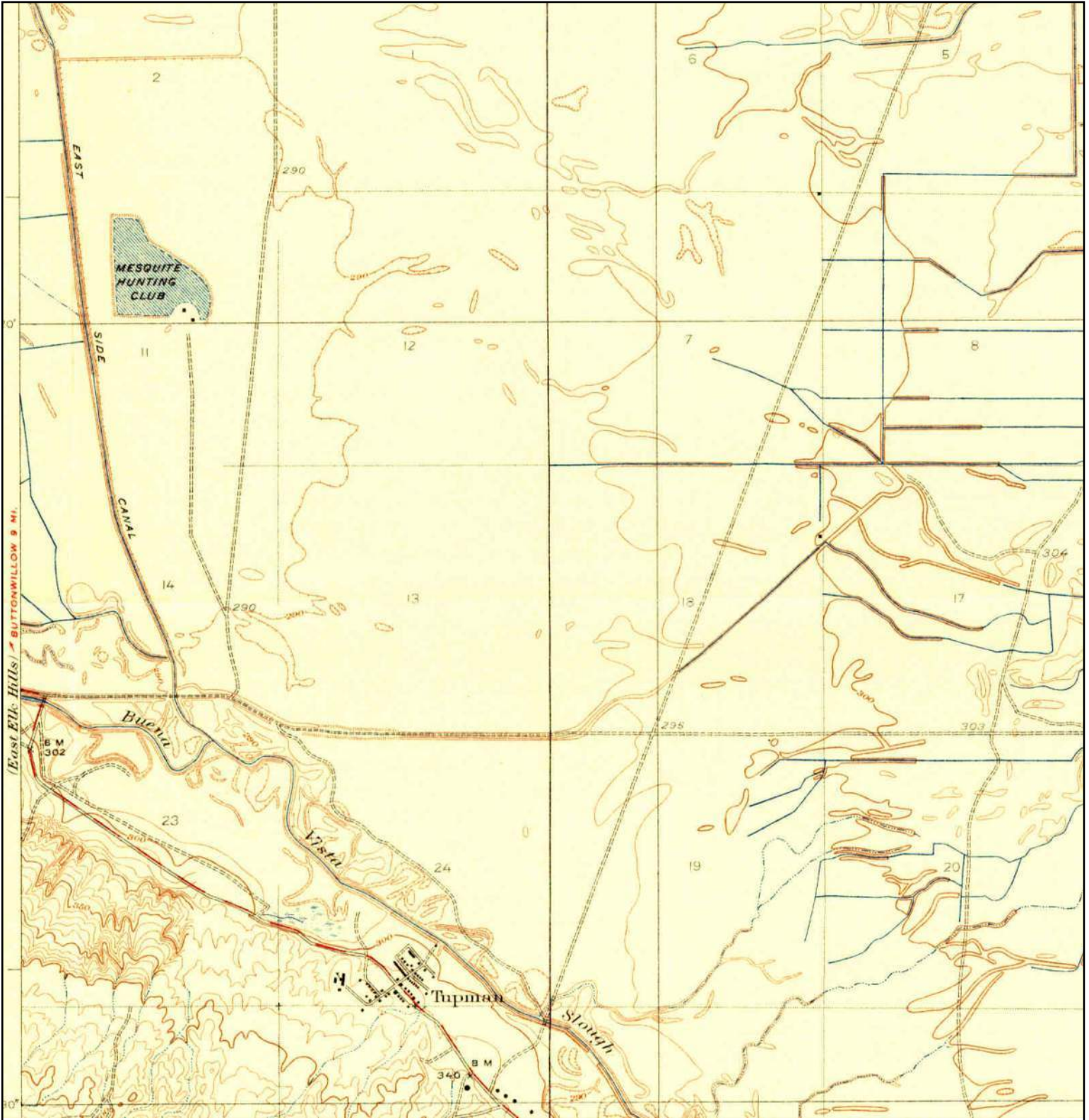
# Historical Topographic Map



<p>N</p> 	<b>ADJOINING QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants	
	<b>NAME:</b> COLES LEEVE	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie	
	<b>MAP YEAR:</b> 1929	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>INQUIRY#:</b> 4394757.4	<b>RESEARCH DATE:</b> 08/26/2015
	<b>SERIES:</b> 7.5			
	<b>SCALE:</b> 1:31680			

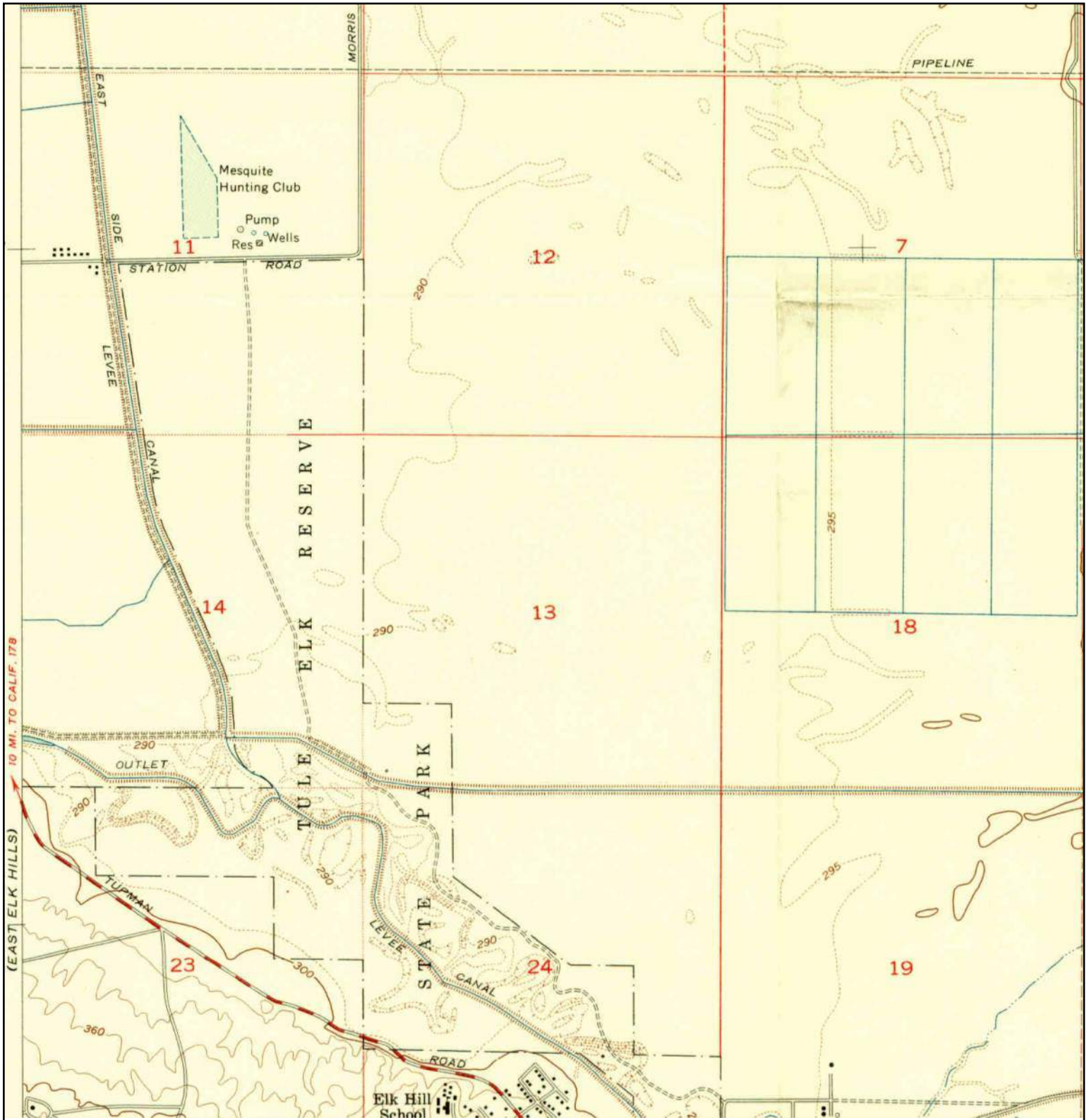


# Historical Topographic Map



	<b>ADJOINING QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	<b>NAME:</b> TUPMAN	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	<b>MAP YEAR:</b> 1933	<b>ADDRESS:</b> Buttonwillow, CA 93206	<b>INQUIRY#:</b> 4394757.4
	<b>SERIES:</b> 7.5	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	<b>SCALE:</b> 1:31680		

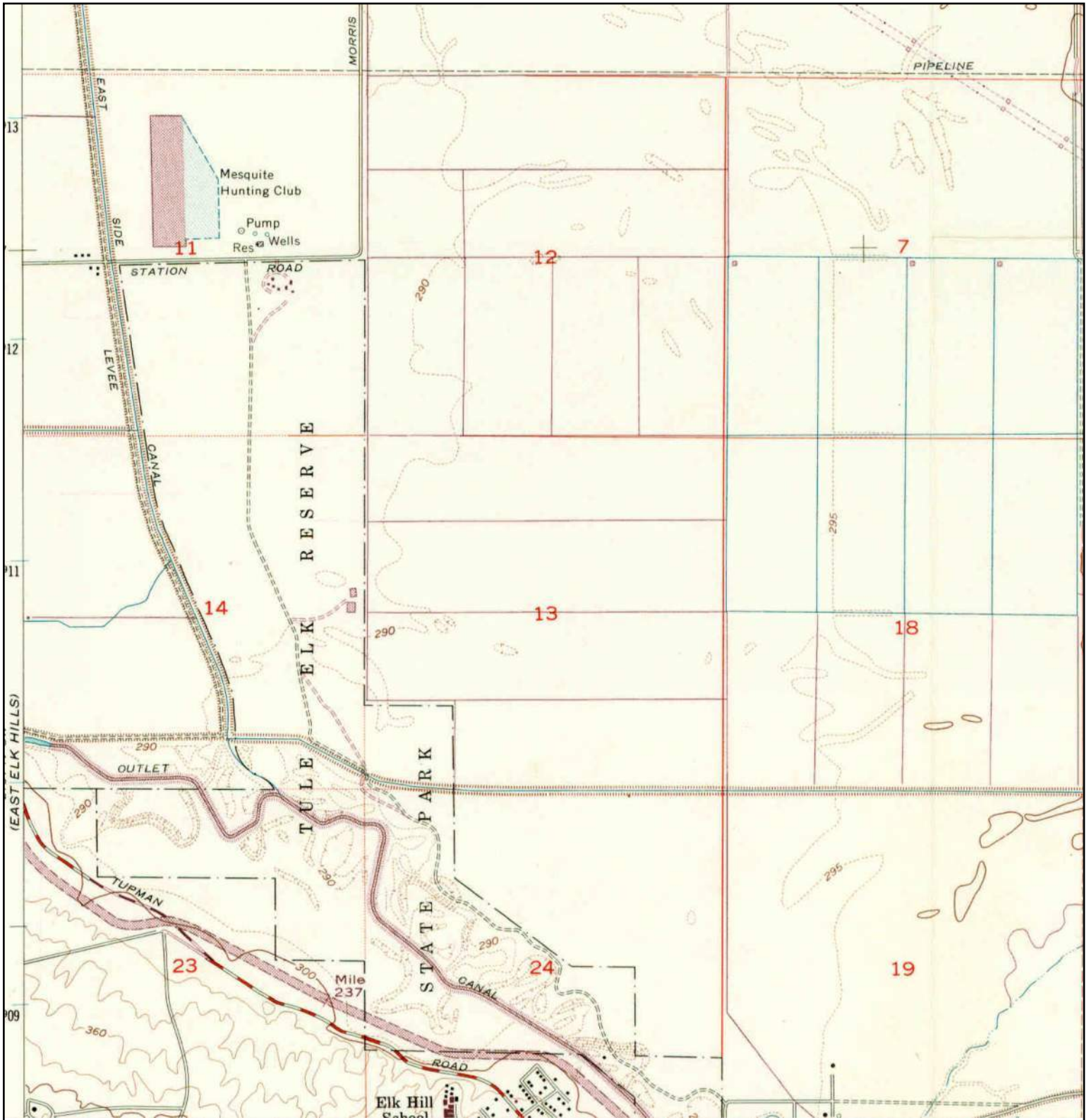
# Historical Topographic Map



<b>N</b> 	<b>ADJOINING QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	<b>NAME:</b> TUPMAN	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	<b>MAP YEAR:</b> 1954	<b>Buttonwillow, CA 93206</b>	<b>INQUIRY#:</b> 4394757.4
	<b>SERIES:</b> 7.5	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	<b>SCALE:</b> 1:24000		

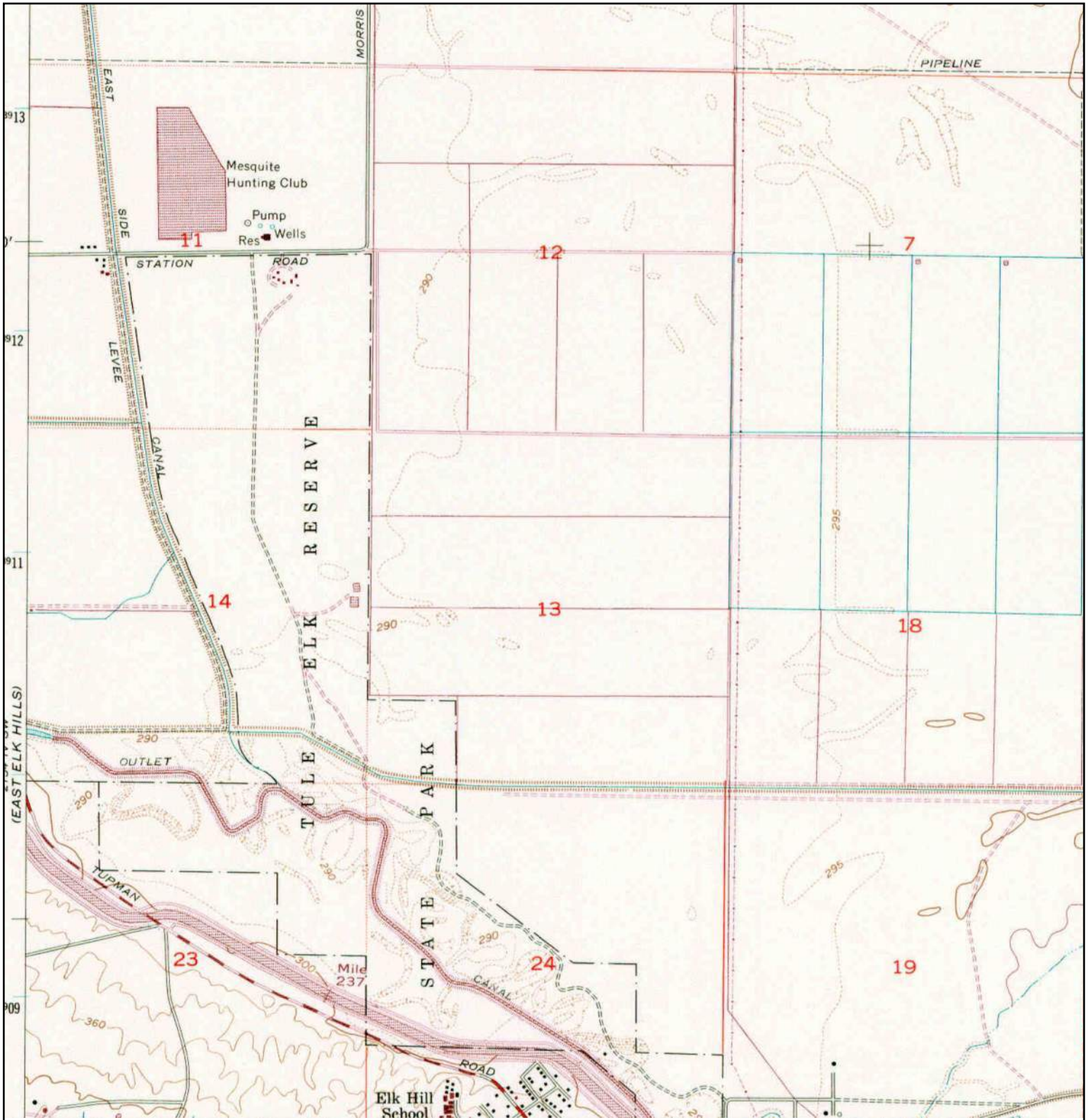


# Historical Topographic Map



<p>N</p>	<b>ADJOINING QUAD</b>			
	NAME:	TUPMAN	<b>SITE NAME:</b>	Buena Vista Palms
	MAP YEAR:	1968	<b>ADDRESS:</b>	BVWSD Buttonwillow, CA 93206
	PHOTOREVISED FROM :	1954	<b>LAT/LONG:</b>	35.3204 / -119.3826
	SERIES:	7.5	<b>CLIENT:</b>	GEI Consultants
	SCALE:	1:24000	<b>CONTACT:</b>	Stephanie
		<b>INQUIRY#:</b>	4394757.4	
		<b>RESEARCH DATE:</b>	08/26/2015	

# Historical Topographic Map



<p>N</p>	<b>ADJOINING QUAD</b>	<b>SITE NAME:</b> Buena Vista Palms	<b>CLIENT:</b> GEI Consultants
	NAME: TUPMAN	<b>ADDRESS:</b> BVWSD	<b>CONTACT:</b> Stephanie
	MAP YEAR: 1973	Buttonwillow, CA 93206	<b>INQUIRY#:</b> 4394757.4
	PHOTOREVISED FROM :1954	<b>LAT/LONG:</b> 35.3204 / -119.3826	<b>RESEARCH DATE:</b> 08/26/2015
	SERIES: 7.5		
	SCALE: 1:24000		



**Buena Vista Palms**

BVWSD

Buttonwillow, CA 93206

Inquiry Number: 4394757.5

August 31, 2015

# The EDR-City Directory Image Report



## TABLE OF CONTENTS

### SECTION

Executive Summary

Findings

City Directory Images

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

### **Disclaimer - Copyright and Trademark Notice**

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2015 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc. or its affiliates is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

## EXECUTIVE SUMMARY

### DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

### RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

<u>Year</u>	<u>Target Street</u>	<u>Cross Street</u>	<u>Source</u>
2013	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
2008	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
2003	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
1999	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
1995	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
1992	<input type="checkbox"/>	<input type="checkbox"/>	Cole Criss-Cross Directory
1990	<input type="checkbox"/>	<input type="checkbox"/>	Haines Criss-Cross Directory
1985	<input type="checkbox"/>	<input type="checkbox"/>	Haines Criss-Cross Directory
1980	<input type="checkbox"/>	<input type="checkbox"/>	Haines Criss-Cross Directory
1975	<input type="checkbox"/>	<input type="checkbox"/>	Haines Criss-Cross Directory

### RECORD SOURCES

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.

## FINDINGS

### TARGET PROPERTY STREET

BVWSD  
Buttonwillow, CA 93206

Year

CD Image

Source

### TUPMAN RD

2013	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
2008	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
2003	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
1999	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
1995	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
1992	-	Cole Criss-Cross Directory	Target and Adjoining not listed in Source
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source
1975	-	Haines Criss-Cross Directory	Street not listed in Source

## FINDINGS

### CROSS STREETS

No Cross Streets Identified



**Buena Vista Palms**

BVWSD

Buttonwillow, CA 93206

Inquiry Number: 4394757.9

August 31, 2015

## The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th Floor  
Shelton, Connecticut 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)



# EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

**When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.**

***Thank you for your business.***  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

## **Disclaimer - Copyright and Trademark Notice**

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2015 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

**Date EDR Searched Historical Sources:**

Aerial Photography August 31, 2015

**Target Property:**

BVWSD

Buttonwillow, CA 93206

<u><i>Year</i></u>	<u><i>Scale</i></u>	<u><i>Details</i></u>	<u><i>Source</i></u>
1937	Aerial Photograph. Scale: 1"=500'	Flight Year: 1937	USGS
1942	Aerial Photograph. Scale: 1"=500'	Flight Year: 1942	USGS
1952	Aerial Photograph. Scale: 1"=500'	Flight Year: 1952	USGS
1968	Aerial Photograph. Scale: 1"=500'	Flight Year: 1968	USGS
1975	Aerial Photograph. Scale: 1"=500'	Flight Year: 1975	USGS
1984	Aerial Photograph. Scale: 1"=500'	Flight Year: 1984	USGS
1994	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1994	USGS/DOQQ
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	USDA/NAIP
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	USDA/NAIP
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	USDA/NAIP
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	USDA/NAIP
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	USDA/NAIP



**INQUIRY #:** 4394757.9

**YEAR:** 1937

| = 500'







**INQUIRY #:** 4394757.9

**YEAR:** 1942

| = 500'







**INQUIRY #:** 4394757.9

**YEAR:** 1952

| = 500'







INQUIRY #: 4394757.9

YEAR: 1968

| = 500'





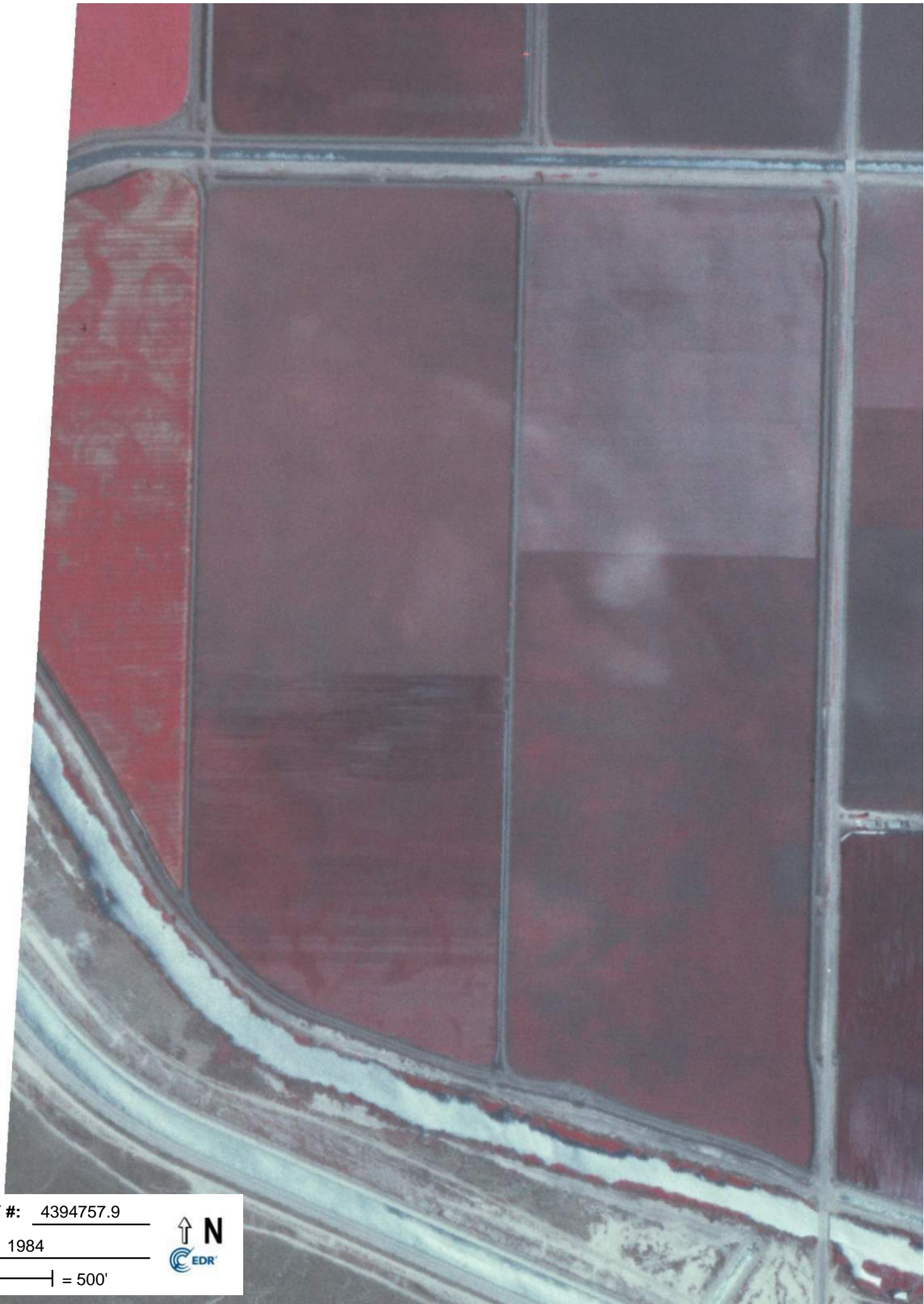


**INQUIRY #:** 4394757.9

**YEAR:** 1975

| = 500'





**INQUIRY #:** 4394757.9

**YEAR:** 1984

| = 500'





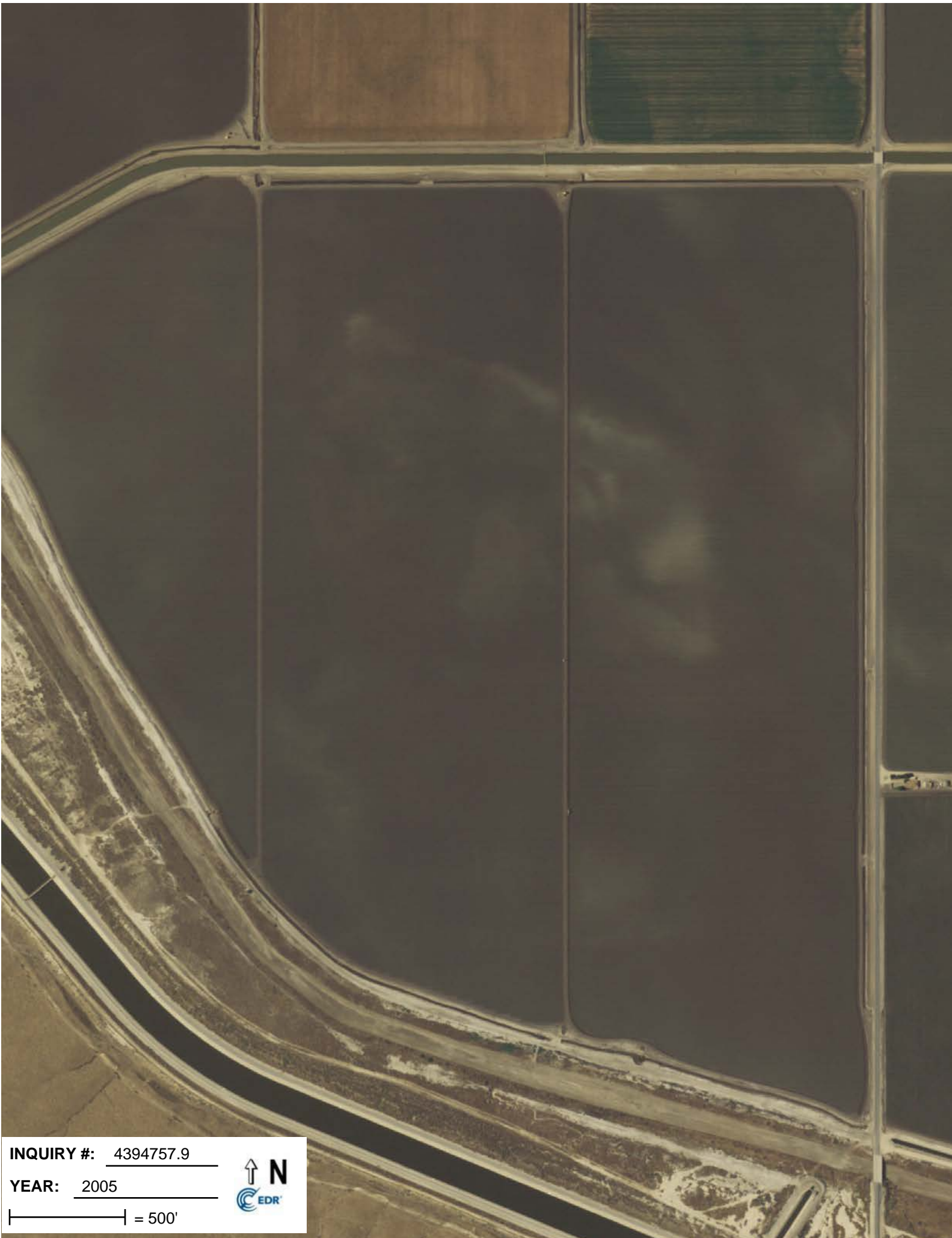


**INQUIRY #:** 4394757.9

**YEAR:** 1994

| = 500'





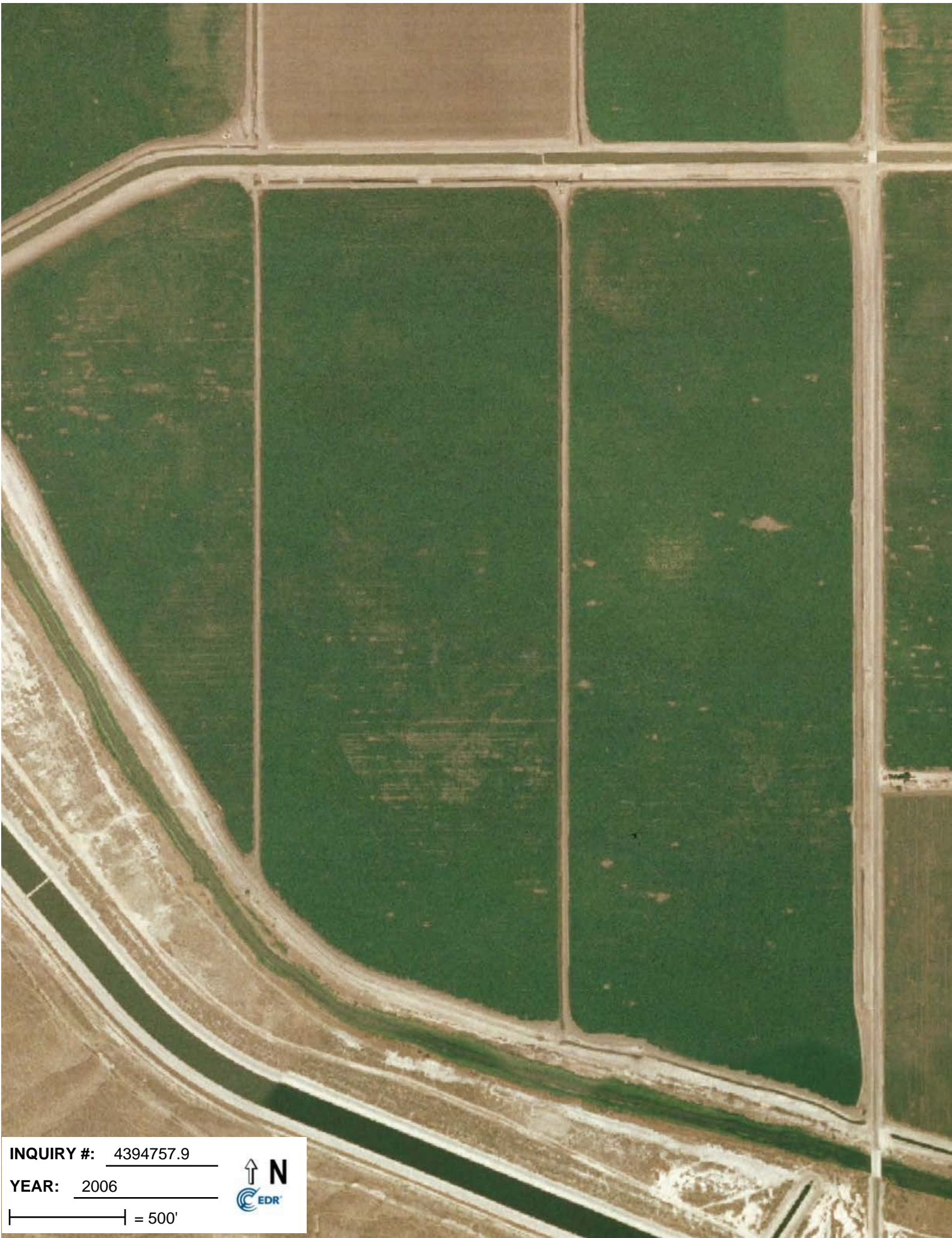
**INQUIRY #:** 4394757.9

**YEAR:** 2005

| = 500'







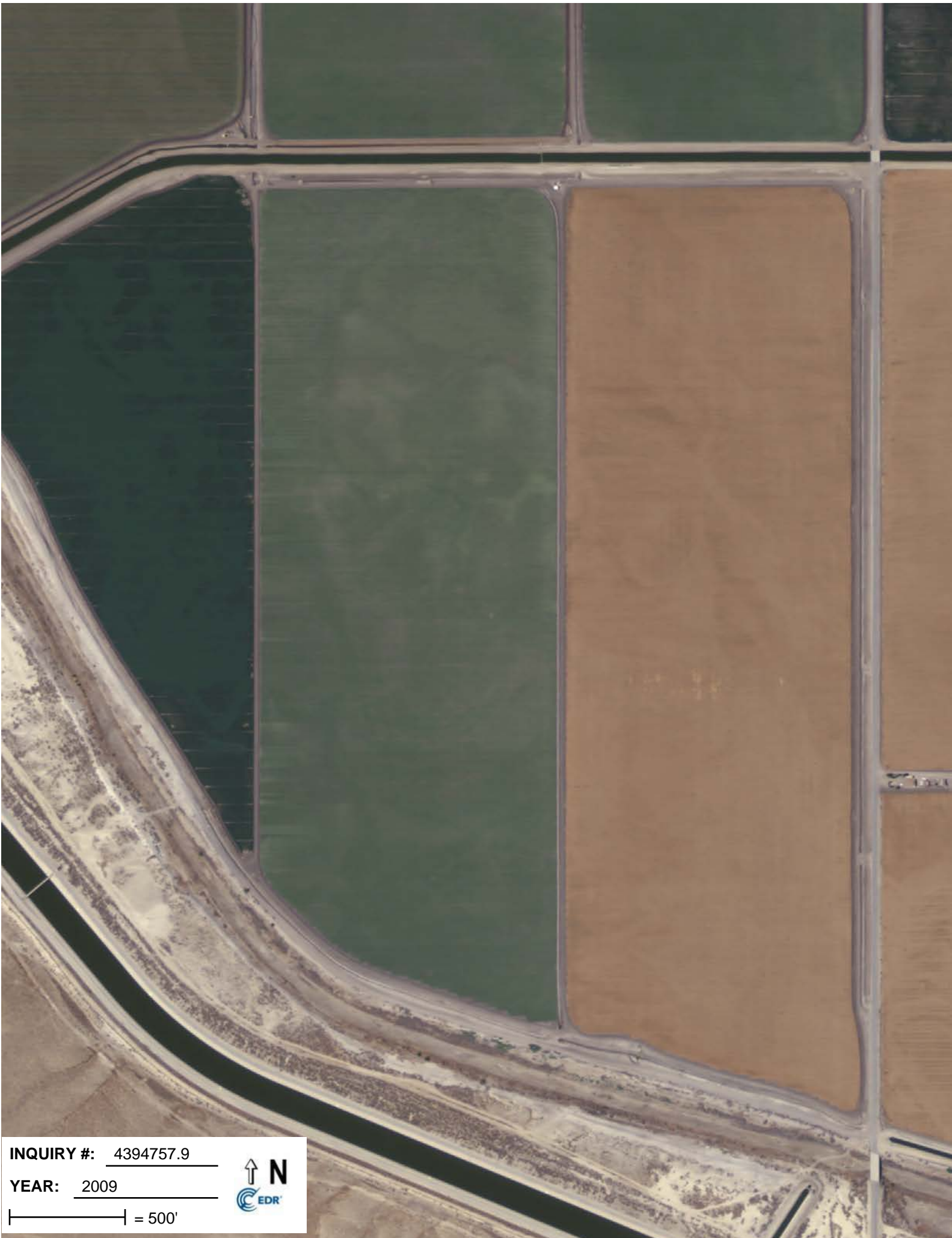
**INQUIRY #:** 4394757.9

**YEAR:** 2006

| = 500'







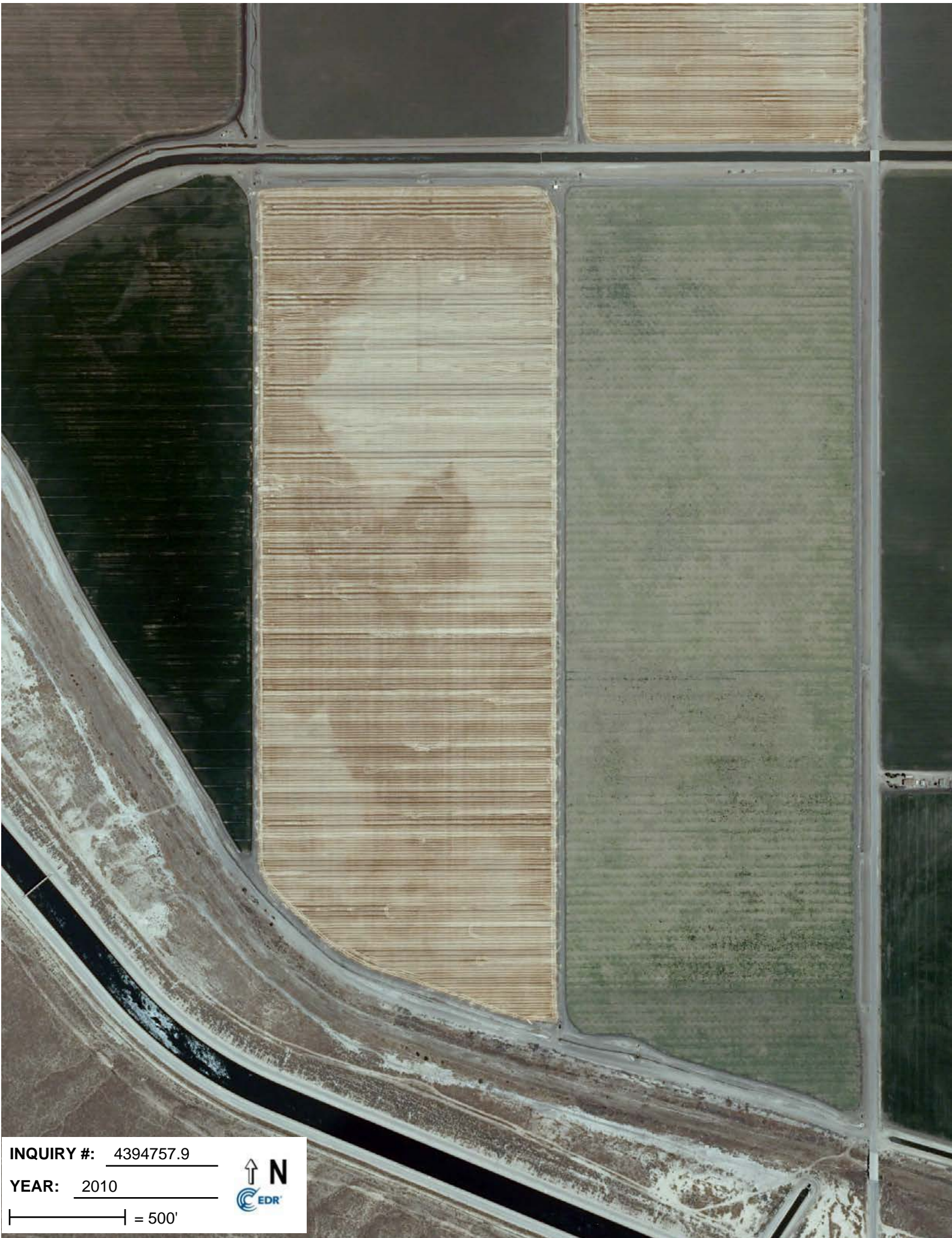
**INQUIRY #:** 4394757.9

**YEAR:** 2009

| = 500'







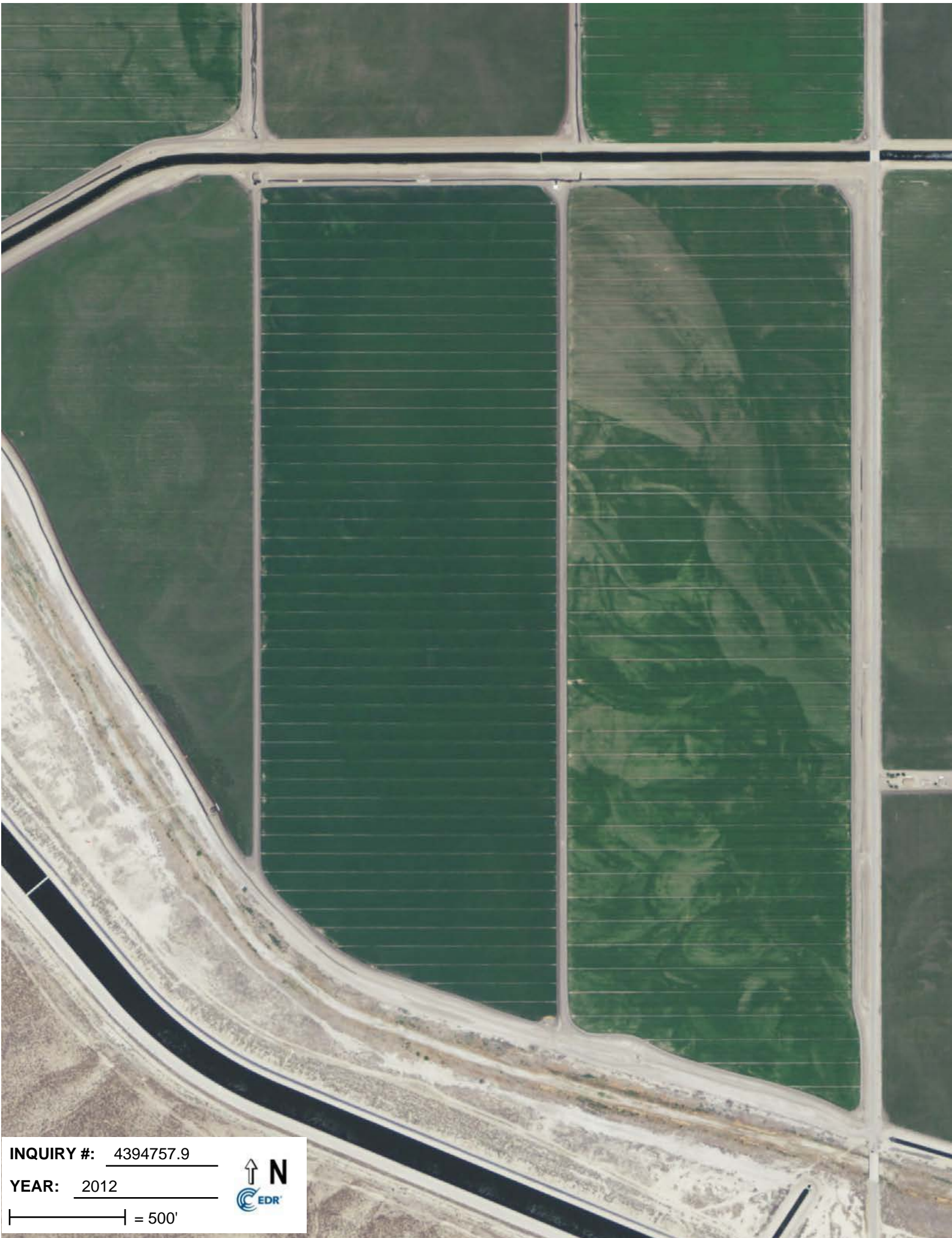
**INQUIRY #:** 4394757.9

**YEAR:** 2010

| = 500'







**INQUIRY #:** 4394757.9

**YEAR:** 2012

| = 500'



# **Appendix E – HECA Phase I Environmental Site Assessment**

---

---

## **Appendix L**

### **Phase I Environmental Site Assessment**





# PHASE I ENVIRONMENTAL SITE ASSESSMENT

Hydrogen Energy California (HECA)  
Project Site  
Kern County, California

Prepared for  
Hydrogen Energy California LLC

April 2012

1 Montgomery Street, Suite 900  
San Francisco, California 94104

28068052



# TABLE OF CONTENTS

---

1.	Introduction.....	1-1
1.1	Purpose.....	1-1
1.2	Detailed Scope-of-Services.....	1-1
1.3	Limitations and Exceptions.....	1-2
1.4	User Reliance.....	1-3
2.	Property Description and Subject Property Environment .....	2-1
2.1	Location and Property Description.....	2-1
2.2	Site Characteristics.....	2-2
2.3	Current and Historical Uses of the Site.....	2-2
2.4	Local Geology and Hydrogeology.....	2-2
2.4.1	Geology.....	2-3
2.4.2	Hydrology.....	2-4
3.	Subject Property History/Historic Review .....	3-1
3.1	Site and Adjoining Property Historical Use Information .....	3-1
3.1.1	Aerial Photographs.....	3-1
3.1.2	Topographic Maps .....	3-1
3.1.3	City Directories.....	3-1
3.1.4	Sanborn™ Fire Insurance Maps .....	3-1
3.1.5	Environmental Lien and Activity Use Limitation Search.....	3-5
3.2	Previous Reports .....	3-5
4.	Records Review.....	4-1
4.1	Regulatory Records.....	4-1
4.1.1	Regulatory Database Search Report .....	4-1
4.2	User-Provided Information .....	4-6
5.	Agency Contacts .....	5-1
5.1	Local Government/Regulatory Agency Representatives.....	5-1
5.1.1	Kern County Environmental Health Services Department.....	5-1
5.1.2	Kern County Fire Department .....	5-2
5.1.3	Cal-EPA Department of Toxic Substances Control.....	5-2
5.1.4	Regional Water Quality Control Board .....	5-3
5.1.5	U.S. Environmental Protection Agency.....	5-3
6.	Subject Property Reconnaissance.....	6-1
6.1	Methodology and Limiting Conditions.....	6-1
6.2	General Setting.....	6-1
6.3	Interior and Exterior Observations.....	6-2
6.3.1	Structures, Grounds, and Subject Property Access.....	6-2

# TABLE OF CONTENTS

---

6.3.2	Water, Utilities, Pipelines .....	6-2
6.3.3	Wells .....	6-2
6.3.4	Wastewater Discharge .....	6-3
6.3.5	Stormwater Drainage/Discharge.....	6-3
6.3.6	Drains and Sumps .....	6-3
6.3.7	Solid Waste Disposal .....	6-3
6.3.8	Process Equipment.....	6-3
6.3.9	Underground Storage Tanks .....	6-3
6.3.10	Aboveground Storage Tanks.....	6-4
6.3.11	Other Hazardous Materials/Waste Storage.....	6-4
6.3.12	Pits, Ponds, and Lagoons .....	6-4
6.3.13	Stained/Discolored Soil or Pavement .....	6-4
6.3.14	Evidence of Fill or Illegal Dumping .....	6-5
6.3.15	Transformers/PCB Items .....	6-5
6.3.16	Air Emissions.....	6-5
6.3.17	Asbestos-Containing Materials.....	6-5
6.3.18	Lead-Based Paint .....	6-5
6.3.19	Radon .....	6-5
7.	Findings and Opinions.....	7-1
8.	Conclusions.....	8-1
9.	References .....	9-1
10.	Qualifications of Environmental Professionals .....	10-1
10.1	Corporate.....	10-1
10.2	Individual .....	10-1

## List of Figures

Figure 1 Subject Property Location Map

Figure 2 Site Plan

## List of Tables

Table 2-1 Subject Property Parcels

Table 3-1 Historic Site Information

Table 4-1 Databases Searched by Environmental Data Resources, Inc.

## List of Appendices

Appendix A Curricula Vitae

Appendix B Subject Property Reconnaissance Photographs

# TABLE OF CONTENTS

---

Appendix C	Historical Research Documentation
Appendix D	Regulatory Database Search Report
Appendix E	Port Organics Products, LTD Tailing Piles Soil Sample Analysis
Appendix F	AECOM 2010 Phase II Environmental Site Assessment
Appendix G	Kern County Environmental Health Services Department Inspection Documentation

# ACRONYMS

---

AOCs	Areas of Concern
API	American Petroleum Institute
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
CalARP	California Accidental Release Prevention Program
Cal-EPA	California Environmental Protection Agency
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CHHSL	California Human Health Screening Level
CORRACTS	Corrective Action RCRA TSDFs
DOGGR	California Division of Oil, Gas, and Geothermal Resources
DTSC	California Department of Toxic Substances Control
EDR	Environmental Data Resources, Inc.
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
U.S. EPA	United States Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Subject Property Assessment
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System
HECA	Hydrogen Energy California
HECA LLC	Hydrogen Energy California LLC
HEI LLC	Hydrogen Energy International, LLC
HIST	historical
HMBP	Hazardous Materials Business Plan
KCEHSD	Kern County Environmental Health Services Department
KCFD	Kern County Fire Department
LUST	leaking underground storage tank
mg/kg	milligrams per kilogram
NOVs	Notices of Violations
NPL	National Priority List



## ACRONYMS

---

PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PG&E	Pacific Gas and Electric Company
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RSL	Regional Screening Level
RWQCB	Regional Water Quality Control Board
TPH	total petroleum hydrocarbons
TSDf	treatment, storage, and disposal facility
URS	URS Corporation
UST	underground storage tank
VOCs	volatile organic compounds



## 1.1 PURPOSE

The purpose of this Phase I Environmental Site Assessment (ESA) is to provide a professional opinion on the potential presence of current recognized environmental conditions (RECs) at the Subject Property, which is more fully defined in Section 2.1, Location and Property Description. The Subject Property is defined as the Hydrogen Energy California (HECA) Project Site, or Project Site, and consists of approximately 453 acres.

Figure 1, Subject Property Location Map, and Figure 2, Site Plan, illustrate the location and features of the Subject Property. The parcels comprising the Subject Property are listed in Table 2-1, Subject Property Parcels.

REC, as defined by American Society for Testing and Materials (ASTM) Designation E 1527-05, means “the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not recognized environmental conditions.”

This ESA was performed according to the recommended guidelines established by ASTM Designation E 1527-05, “Standard Practice for Environmental Subject Property Assessments: Phase I Environmental Subject Property Assessment Process.” Because there are multiple federal and state definitions of hazardous materials, for the purpose of this report, hazardous substances and petroleum products are jointly referred to as “hazardous materials.”

## 1.2 DETAILED SCOPE-OF-SERVICES

URS Corporation (URS) was retained by Hydrogen Energy California LLC (HECA LLC) to conduct a Phase I ESA for the Subject Property. URS performed the following work:

1. Reviewed available geologic maps and literature for information on the physical and hydrogeologic settings of the Subject Property.
2. Contracted with Environmental Data Resources, Inc. (EDR), to conduct a regulatory database search of known aboveground storage tanks (ASTs); underground storage tanks (USTs); landfills; hazardous waste generation or treatment, storage, and disposal facilities (TSDFs); and subsurface contamination in the surrounding area up to within 1 mile of the Subject Property (see Appendix D). Based on ASTM Practice, the following search distances from the Subject Property boundaries were used to assess potential environmental impacts:
  - 0.75-mile radius for registered ASTs, underground storage tanks (USTs), Resource Conservation and Recovery Act (RCRA) waste generators, and mines.

- 1-mile radius for leaking underground storage tanks (LUSTs); landfills; Non-Corrective Action RCRA TSDFs; and Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites.
  - 1.5-mile radius for Corrective Action RCRA TSDFs (CORRACTS), state sites with potential or confirmed hazardous substance releases, and United States Environmental Protection Agency (U.S. EPA) Superfund sites.
3. Researched the history of the Subject Property by reviewing a chronological series of historical aerial photographs and a chronological series of historic topographic maps for the Subject Property and surrounding properties. Copies of these documents are presented in Appendix B.
  4. Performed a reconnaissance of the Subject Property and publicly accessible adjacent areas on February 8, 2012, for obvious evidence of potential contamination sources such as current hazardous materials storage or use; unusually stained soils, slabs, and pavements; drains, sumps, drums, tanks, and electrical transformers; stressed vegetation; and discarded hazardous materials containers. Photographs taken during Subject Property reconnaissance are included in Appendix B of this report.
  5. Interviewed Mr. John Cauzza III and Mr. Sam Ackerman regarding their former respective properties.
  6. Interviewed Mr. Dane Peacock of BP as representative of the current property owner (Hydrogen Energy International [HEI], LLC).
  7. Reviewed records available from HEI LLC, HECA LLC, and Mr. John Cauzza III.
  8. Requested supplemental records for information regarding the Subject Property from the Kern County Environmental Health Services Department (KCEHSD), the Kern County Fire Department (KCFD), the California Environmental Protection Agency (Cal-EPA), the Regional Water Quality Control Board (RWQCB), and the U.S. EPA.
  9. Evaluated the information collected to prepare this report.
  10. Prepared this report.

### 1.3 LIMITATIONS AND EXCEPTIONS

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all warranties, expressed or implied.

No evaluation for the presence of asbestos-containing building materials, urea-formaldehyde foam insulation, or other hazardous building materials; mold; methane; radon gas; lead in drinking water; wetlands; industrial hygiene and health and safety; ecological resources and endangered species; indoor air quality; or high-voltage power lines is included in this assessment.

These findings and opinions are based on information available from public sources on specific dates (historical photographs, maps, and regulatory agency files, lists, and databases), more

specifically set forth in Appendix A and Appendix B. Although this information is updated continually, it can be incomplete. Information obtained from interviews or provided to URS by Mr. John Cauzza III, Mr. Sam Ackerman, Mr. Dane Peacock, or HEI LLC is assumed to be correct and complete. URS does not assume any liability for information obtained that has been misrepresented, or for items not visible, accessible, or present on the Subject Property at the time of the field reconnaissance. All areas of the Subject Property were accessible during the February 8, 2012, site visit; however, respect for the crops precluded close-up inspection of the drainage ditches and selected agricultural fields which were observed from roads and other accessible areas.

There is no investigation that is thorough enough to preclude the presence of materials on the Subject Property that currently, or in the future, may be considered hazardous. URS cannot warrant or guarantee that not finding indicators of hazardous materials means that hazardous materials do not exist on the Subject Property.

Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

#### **1.4 USER RELIANCE**

This report has been prepared for the sole use of HECA LLC. This report shall not be relied upon by any other party without written authorization from HECA LLC and URS Corporation (URS).



## 2.1 LOCATION AND PROPERTY DESCRIPTION

The Subject Property is situated in the western-central portion of Kern County, in Section 10 of Township 30 South, Range 24 East, as shown on Figure 1. The Subject Property is west of Tupman Road and south of Adohr Road. The street address of the Project Site is 7361 Adohr Road.

The Subject Property is approximately 1.5 miles northwest of the unincorporated community of Tupman, California; approximately 1 mile south of Stockdale Highway; and approximately 2 miles southwest of Interstate 5 (which extends generally from the southeast to northwest, east of the Subject Property). The Tule Elk State Reserve is approximately 0.25 mile east of the Subject Property, east of Tupman Road.

The Subject Property consists of agricultural fields bisected by irrigation and drainage canals. Figures 1 and 2 show the Subject Property location and layout. The Subject Property is bounded by the following:

- North: Agricultural fields, a Farm Operations Area, two occupied residences, the Ackerman Property, with Adohr Road beyond (see Photos 1 and 2 in Appendix B).
- South: Agricultural fields and an irrigation canal.
- East: Tupman Road, with agricultural fields beyond.
- West: A dirt farm road (herein referred to as Dairy Road right-of-way) (see Photo 3).

For purposes of clarification, and because of recent changes to property ownership, the following parcels north of the Subject Property are referred to as follows:

- The 4.72-acre parcel containing a residence located northwest of the Subject Property is herein referred to as the Ackerman Property. For the purposes of the HECA Project, this is within the area referred to as the Controlled Area, which consists of property adjacent to the Project Site that will be owned and controlled by HECA LLC.
- The approximately 30-acre area containing storage barns, a maintenance shop, a disused rice elevator, and a residence is referred to as the Farm Operations Area. This area is also within the Controlled Area.

The Subject Property includes portions of three parcels listed in Table 2-1. The majority of the Subject Property is currently comprised of agricultural land as shown in Figure 2 and Photos 4 through 7 in Appendix B).

According to Mr. John Cauzza III and Mr. Sam Ackerman, the Subject Property parcels were purchased from Palm Farms, Inc., in 1995 and subsequently sold to HECA LLC in February 2011. According to Mr. Dane Peacock of BP, ownership of the parcels was transferred from HECA LLC to HEI LLC in September 2011.



**Table 2-1  
Subject Property Parcels**

APN	Current Owner	Approximate Size (acres)
Part of 159-040-02	HEI LLC	75
Part of 159 040-16	HEI LLC	376.5
Part of 159-040-18	HEI LLC	1.5
<b>Total</b>		<b>453</b>

## 2.2 SITE CHARACTERISTICS

The Subject Property is approximately 453 acres, with the majority currently comprised of agricultural land, including cultivation of cotton, alfalfa, and onions. There are no buildings on the Subject Property.

The Subject Property includes portions of irrigation and drainage canals, which generally extend from north to south.

The West Side Canal (and the Outlet Canal), Kern River Flood Control Channel, and the California Aqueduct (State Water Project) are approximately 500, 700, and 1,900 feet south of the Project Site, respectively.

## 2.3 CURRENT AND HISTORICAL USES OF THE SITE

According to historical aerial photographs and topographic maps, the Subject Property has historically been and currently remains primarily in agricultural use. According to Mr. John Cauzza III, the Subject Property was purchased in 1995. Under the previous owners, Palm Farms, Inc., the Subject Property was used for agricultural production.

HEI LLC purchased the Subject Property in 2011 and leased it back to Cauzza Farms for agricultural use.

## 2.4 LOCAL GEOLOGY AND HYDROGEOLOGY

The elevation of the Subject Property is approximately 288 feet above mean sea level. The Subject Property is located in the San Joaquin Valley. The San Joaquin Valley is California's leading agricultural producing region, and five of its counties (Fresno, Kern, Tulare, Merced, and Stanislaus) rank among the state's top 10 counties in farm production value. Oil and gas is also an important industry in the San Joaquin region. The deepest wells and about half of the largest oil fields are found in Kern County, as is the Elk Hills Oil Field (formerly named the Elk Hills Naval Petroleum Reserve). The Subject Property is generally flat, and the topographic gradient generally slopes to the west.

### 2.4.1 Geology

The San Joaquin Valley is bordered to the east by the Sierra Nevada Mountain Range or batholith. The Sierra Nevada batholith is composed of granitic rocks variously described as granite, quartz-monzonite, granodiorite, and quartz diorite. The Coastal Ranges border the San Joaquin Valley to the west. The Coastal Ranges were formed in the Late Pliocene age, and major deformation of the ranges and adjacent parts of the San Joaquin Valley occurred. Surface anticlines such as Elk Hills, Kettleman Hills, and Wheeler Ridge quickly became major surface features rising from the valley floor. This deformation and uplift continues today and is measured at places such as Buena Vista Hills.

The valley that formed between the Sierras to the east and the Coastal Ranges to the west is an asymmetrical synclinal trough with an axis centered to the west. The elongate lowland known as the Great Valley is in size 400 miles long and 50 miles wide and rises from slightly below sea level in the delta area to 400 feet in elevation at the northern and southern ends. The southern portion is called the San Joaquin Valley. Bakersfield and Tupman, California, are located on the southeastern end. Over 30,000 feet of sediments ranging in age from Cretaceous to recent have accumulated within the San Joaquin Basin. The basin was formed from compressive forces between the North American and Pacific continental plates. As the basin sank, sediments from the rising mountains to the east (ancestral Sierra Nevada) and lesser amounts from the west accumulated in a thick wedge in the valley. The valley was once a great inland sea basin that was inundated or flooded periodically. The last large lake to occupy the Valley was Lake Corcoran about 600,000 years ago. The lake occupied approximately the western half of the Valley from the Stockton arch south to the bend in the San Joaquin River.

Kern County is located in the southern Central Valley and extends east beyond the southern slope of the Eastern Sierra Nevada range into the Mojave Desert and includes parts of the Indian Wells Valley and the Antelope Valley. From the Sierras, the county extends across the floor of the San Joaquin Valley to the eastern edge of the Temblor Range, part of the Coastal Ranges. To the south, the county extends over the ridge of the Tehachapi Mountains.

The EDR report included soil data for two locations in the vicinity of the Subject Property. Data for the first location indicated a soil component name of Lokern with surficial deposits generally less than 7 inches deep. These soils are moderately well drained and have slow infiltration rates. There are two subsurface layers in this soil. The upper layer exists at a depth from 7 to 48 inches, and the lower (deeper) layer exists at a depth between 48 to 66 inches. Although no soil texture classes were reported by EDR for these soils, bedrock occurs at a depth greater than 66 inches below ground surface (bgs). The second location indicated a soil component name of Buttonwillow with surficial deposits generally less than 27 inches deep. These soils are moderately well-drained and have slow infiltration rates. There are two subsurface layers in this soil. The upper layer exists at a depth from 27 to 55 inches, and the lower (deeper) layer exists at a depth between 55 to 64 inches. Although no soil texture classes were reported by EDR for these soils, bedrock occurs at a depth greater than 64 inches bgs.

## 2.4.2 Hydrology

### *Surface Water*

Surface water exists south of the Subject Property in canals and on the Subject Property in a few drainage ditches and irrigation ditches. Water is not constantly present in the Outlet Canal on the southern boundary of the Subject Property or in the drainage ditches but would be present during periods of time when crops are being irrigated. At the approximate east–west center of the Subject Property, an irrigation canal briefly extends to the southwest before intersecting with the West Side and Outlet Canals. The drainage ditch extends from the northwest to the southeast. Several smaller irrigation ditches traverse the Subject Property from north to south and east to west around crop fields. The irrigation ditches are fed by the West Side Canal, lying southwest of the Subject Property, and the East Side Canal, which lies approximately 0.25 mile east of the northeastern corner of the Subject Property (at the intersection of Adohr and Tupman Roads).

The Subject Property generally slopes to the west, toward the West Side Canal. From observation of the Subject Property and input provided by Mr. John Cauzza III, it appears that any surface water runoff caused by storm precipitation events would flow to the west and drain into the West Side Canal.

The Kern River Flood Control Channel is located approximately 700 feet south of the Project Site. This channel conveys overflows from the Kern River during flood events. The floodplain associated with this channel does not extend onto the Project Site. The California Aqueduct, which supplies agricultural and municipal areas in Southern California, is located parallel to and west of the West Side and Outlet canals, approximately 500 feet south of the Project Site.

According to Federal Emergency Management Agency (FEMA) data provided by EDR, the Subject Property is not situated within a 100-year or 500-year flood zone.

### *Groundwater and Oil and Gas Wells*

The EDR report (Appendix D) mapped two groundwater wells on the Subject Property (in the central portion of the Subject Property), and an additional nine wells located within 0.5 mile of the property boundary. The two wells mapped in agricultural fields on the Subject Property were not visible during the URS 2012 site visit.

The EDR report lists two California Division of Oil, Gas, and Geothermal Resources (DOGGR)-registered oil and gas wells within a 1-mile radius from the boundary of the Subject Property. It appears that one of these wells (American Petroleum Institute [API] well number 02952932) was located in the central portion of the Subject Property. API well number 02937474 was located approximately 0.5 mile south of the Subject Property. These former wells are shown in the EDR Report in Appendix D. The DOGGR database entry stated that these wells were plugged and abandoned (dry hole), as of November 18, 1950. URS visited the locations of the two DOGGR wells and saw no evidence of the wells in the cultivated fields.

*Wetlands*

There are no mapped wetlands located on the Subject Property. According to the National Wetland Inventory map included in the EDR report, the nearest national and state wetlands are a small area approximately 0.1 mile east of the Subject Property border near the intersection of Tupman Road and Station Road. In addition, more extensive wetlands are mapped generally extending from the southeast to the northwest, in the Kern River Flood Control Channel.



### 3.1 SITE AND ADJOINING PROPERTY HISTORICAL USE INFORMATION

URS reviewed aerial photographs, historical topographic maps, and city directories to compile the historical site information presented in Table 3-1 below. URS requested historical Sanborn™ fire insurance maps for the Subject Property; however, none were available.

#### 3.1.1 Aerial Photographs

URS reviewed 29 aerial photographs for the Subject Property and the surrounding areas available through EDR. Photographs were dated from 1946 (two photos), 1956 (two photos), 1967, 1974, 1984, 1994, 2005, and 2006. Each of the aerial photographs depicts the Subject Property as undeveloped and in use for agricultural production; primarily, crop production. These aerial photographs are included in Appendix C, and the descriptions of the photos are presented in Table 3-1.

#### 3.1.2 Topographic Maps

URS reviewed five historic topographic maps of the Subject Property and surrounding properties available through EDR representing the years 1912, 1933, 1954, 1968, and 1973. The topographic maps reviewed are included in Appendix C, and the descriptions of the maps are presented in Table 3-1.

#### 3.1.3 City Directories

URS requested historic city directories for the Subject Property from EDR through their collection of Haines Criss-Cross Directories for the years 1971 through 2006. EDR found no properties listed at the Subject Property address of Dairy Road/Adohr Road; Buttonwillow, California 93206.

URS requested historic city directories for surrounding properties from EDR using their Haines Criss-Cross Directories for the years 1971 through 2006 (although these years are not necessarily inclusive). EDR reported that city directories were available for the following properties surrounding the source:

- 2001: Residence at 7345 Adohr Road, Buttonwillow, CA 93206
- 2001: Port Organic Products, Inc., at 7361 Adohr Road, Buttonwillow, CA 93206
- 2006: Residence at 7345 Adohr Road, Buttonwillow, CA 93206
- 2006: Port Organic Products, Inc., at 7361 Adohr Road, Buttonwillow, CA 93206

Although these properties are located in unincorporated Kern County, they have Buttonwillow addresses for mailing and directory purposes.

#### 3.1.4 Sanborn™ Fire Insurance Maps

EDR reported that there were no Sanborn™ Fire Insurance Maps available for the Subject Property. Sanborn Fire Insurance Maps typically include information pertaining to fire risk and may provide details related to buildings and other structures located on a specified property. It is not uncommon for these maps to be unavailable for these reports, and it is not an indication of potential environmental risk if no maps are available for the Subject Property.

**Table 3-1  
Historic Site Information**

Date	Location	Finding	Source
1912	Subject Property	The 1912 topographic map does not contain section numbers, which makes it difficult to accurately identify the Subject Property. The Subject Property appears to be undeveloped, and no features are shown on the site itself.	USGS Topo map, 1912 Buena Vista Lake, California
	Adjacent Properties	Surrounding area features include the Elk Hills, the town of Buttonwillow, the West Side Canal, Buena Vista and Lake sloughs, North and Coles levees, the Southern Pacific Railroad (approximately 4.5 miles to the north), and two oil pumping stations (approximately 5.5 miles to the northwest and 6 miles to the west).	
1933	Subject Property	The 1933 topographic map shows the eastern edge of the Subject Property. No features or buildings are visible on the site, and it appears undeveloped.	USGS Topo map, 1933 Tupman, California
	Adjacent Properties	The 1933 topographic map shows the Mesquite Hunting Club directly to the northeast of the Subject Property (northeast of what is now the intersection of Tupman Road and Station Road). The East Side Canal runs along the eastern edge of the Subject Property. The Buena Vista Slough is about 3 miles to the south, and the town of Tupman is about 6 miles to the south of the Subject Property.	
1946	Subject Property	The 1946 aerial photographs show the majority of the Subject Property in use as agricultural fields; however, several narrow, long buildings are present in the north-central portion of the Subject Property. A ditch or levee generally parallel to the west of the drainage ditch is also visible north-south across the Subject Property.	Aerial Photograph, 1946
	Adjacent Properties	There are several buildings north of the Subject Property (in the Farm Operations Area) that match the current storage barns and additional long narrow buildings that are no longer present. A ditch matching the current drainage ditch runs across the Farm Operations Area from the northwest to the southeast.  The areas to the north, east, and west of the Subject Property appear to be undeveloped except for agricultural fields. The area to the south of the Subject Property, past the canals, appears to be undeveloped.	
1954	Subject Property	The Subject Property appears without any structures in the 1956 topographic map.	USGS Topo map, 1954 East Elk Hills, California
	Adjacent Properties	The 1954 topographic map shows Dairy and Adohr roads (the intersection north of the Subject Property) and Tupman Road. Dairy and Tupman roads run north/south, and Adohr Road runs east/west. The map shows small structures north of the Subject Property, and a landing field east of the structures. To the south of the Subject Property, two wells are near a levee that runs east/west. Based on their labels, these wells are presumed to be water wells.	

**Table 3-1  
Historic Site Information (Continued)**

Date	Location	Finding	Source
		<p>There are three wells in the surrounding area: one about 500 feet to the northeast, one 0.25 mile to the east, and one less than 0.5 mile to the northwest. Based on their labels, these wells are presumed to be water wells.</p> <p>The West Side and Outlet canals are south of the Subject Property, with a narrow reservoir running northwest to southeast along the edge of the Outlet Canal. A levee runs south of the Subject Property and connects to a main drain from the north. A pipeline appears north of the Subject Property, originating at the intersection of Tupman and Adohr roads, and extending to the east. The topographic map labels do not identify the nature or content of the pipeline.</p> <p>About 5 miles southwest of the Subject Property, there are numerous oil wells and oil tanks in the east Elk Hills. The area is labeled <i>Naval Petroleum</i>.</p>	
1956	Subject Property	The 1956 aerial photos do not show any of the long narrow structures shown on the 1946 aerial photo. The irrigation ditch or canal seen in the 1946 aerial photograph along the eastern edge of the Subject Property does not appear in the 1956 aerial photograph.	Aerial Photograph, 1956
	Adjacent Properties	The 1956 aerial photos do not show any significant changes in the surrounding areas from the 1946 aerial photos. What appears to be the West Side and Outlet canals are shown south of the Subject Property. An irrigation ditch or canal east of the Subject Property does not appear to be as prominent as in the 1946 aerial photograph.	
1967	Subject Property	The 1967 aerial photos do not show any significant changes in the Subject Property (agricultural fields and undeveloped); however, the two ditches have been replaced by a single north-south ditch that matches the current configuration of the drainage ditch.	Aerial Photograph, 1967
	Adjacent Properties	The 1967 aerial photos do not show any significant changes in the surrounding areas, with the exception of the construction of a new, large canal (the California Aqueduct). Canals and ditches that were apparent in the 1946 and 1956 aerial photos no longer appear on the Subject Property.	
1968	Subject Property	The 1968 map shows only the eastern edge of the Subject Property, which shows no change from the 1933 or 1954 maps for that area.	USGS Topo map, 1968 Tupman, California
	Adjacent Properties	The 1968 map shows only the eastern edge of the Subject Property, which shows no change from the 1933 or 1954 maps for the surrounding areas.	
1973	Subject Property	The 1973 map does not show any significant changes in the Subject Property (agricultural fields and undeveloped land).	USGS Topo map, 1973 Tupman, California
	Adjacent Properties	The 1973 map shows new, large buildings in the Farm Operations Area near the landing field. The 1973 map shows no other significant changes from the 1933, 1954, or 1968 maps of the surrounding areas except for the California Aqueduct, located south of the Subject Property.	



**Table 3-1  
Historic Site Information (Continued)**

Date	Location	Finding	Source
1974	Subject Property	The 1974 aerial photos do not show any significant changes in the Subject Property (agricultural fields and undeveloped land).	Aerial Photograph, 1974
	Adjacent Properties	The 1974 aerial photos do not show any significant changes in the surrounding areas (agricultural fields and relatively undeveloped), with the exception of the completed California Aqueduct.	
1984	Subject Property	The 1984 aerial photos do not show any significant changes in the Subject Property (agricultural fields and undeveloped) from the 1974 aerial photos.	Aerial Photograph, 1984
	Adjacent Properties	The 1984 aerial photos do not show any significant changes in the surrounding areas, with the exception of the completed California Aqueduct south of the site.	
1994	Subject Property	The 1994 aerial photos do not show any significant changes in the Subject Property (agricultural fields and undeveloped) from the 1984 aerial photos.	Aerial Photograph, 1994
	Adjacent Properties	The 1994 aerial photos do not show any significant changes in the surrounding areas (agricultural fields and relatively undeveloped land) from the 1984 aerial photos.	
2001	Subject Property	The 2001 City Directory lists 7361 Adohr Road, Buttonwillow, CA 93206 as Port Organic Products Ltd.	City Directory, 2001
	Adjacent Properties	The 2001 City Directory lists 7345 Adohr Road, Buttonwillow, CA 93206 as residential.	
2005	Subject Property	The 2005 aerial photos does not show any significant changes in the Subject Property (agricultural production and undeveloped land) from the 1994 aerial photos.	Aerial Photograph, 2005
	Adjacent Properties	The 2005 aerial photo does not show any significant changes in the surrounding area with the exception of the addition of equipment, containers, and/or debris on the adjacent parcel to the north (Farm Operations Area) southeast of the rice drying barn.	
2006	Subject Property	The 2006 aerial photo does not show any significant changes in the Subject Property.	Aerial Photograph, 2006
		The 2006 aerial photo does not show any significant changes in the surrounding area.	
	Adjacent Properties	The 2006 City Directory lists 7361 Adohr Road, Buttonwillow, CA 93206 as Port Organic Products, Ltd., and Cauzza Brothers.	
2006	Subject Property	The 2006 City Directory lists 7361 Adohr Road, Buttonwillow CA 93206 as Port Organic Products, Ltd., and Cauzza Brothers.	City Directory, 2006
	Adjacent Properties	The 2006 City Directory lists 7345 Adohr Road, Buttonwillow, CA 93206 as residential.	

Source: EDR Report, 2012.

### 3.1.5 Environmental Lien and Activity Use Limitation Search

URS requested an environmental lien search from EDR, and the results of this search are provided in Appendix C. No environmental liens or Activity Use Limitations were recorded for the Subject Property, according to EDR. According to the Lien Search report the Subject Property is currently owned by HEI LLC.

### 3.2 PREVIOUS REPORTS

URS reviewed the following previous reports in preparing this Phase I ESA. According to Mr. Dane Peacock with BP, the AECOM Phase II ESA of the Subject Property and adjacent areas is the most recent environmental report that was commissioned by HECA LLC.

- The URS Phase I ESA of the HECA Project Site, dated April 6, 2009 (URS, 2009), describes a portion of the current Subject Property; it was based on a 2009 site visit conducted when the Port Organics plant was in operation north of the current Subject Property. This report concluded that RECs were present. Some of the RECs presented in the 2009 Phase I ESA of the 2009 HECA Project Site are applicable to the current Subject Property and are presented in the conclusion section of this report.
- A sampling report prepared by AECOM in September 2009 for samples collected from the interior and exterior fertilizer tailings piles at the former Port Organics plant is provided in Appendix E (AECOM, 2009). Although the samples were labeled as soil, the report indicates that the samples were collected from the tailings piles themselves. During 2009, the Port Organics interior tailings pile was located north and west of the 2009 HECA Project Site boundary, and the exterior tailings pile was located within the 2009 HECA Project Site boundary. These areas are north of the current Subject Property boundaries. The AECOM report indicates that the fertilizer tailing piles are characterized as “Non-RCRA hazardous waste” based on the analytical results. The term “Non-RCRA hazardous waste” means the waste does not meet the federal (RCRA) definition of hazardous waste, but it meets the more-stringent California definition of hazardous waste, as presented in Title 22 of the California Code of Regulations.
- A URS Phase I ESA of the HECA Project Site, dated August 24, 2010 (URS, 2010), describes a portion of the current Subject Property and areas that are adjacent to the current Subject Property, including the Farm Operations Area and the Ackerman Residence. This Phase I ESA was based on a 2010 site visit conducted when Port Organics was no longer operating in the Farm Operations Area. The report concluded that RECs were present; however, only one was located on the Subject Property: the soil staining adjacent to the airstrip and the drainage ditch. In addition, the Phase I ESA report discussed the unknown USTs and the use of pesticides on agricultural fields. These issues are discussed below and in the 2010 Phase II ESA that followed the Phase I ESA report.
- A December 2010, Phase II ESA conducted by AECOM reported on the results of their September 2010 field investigation on and adjacent to the Subject Property. The field investigation included a geophysical investigation to identify potential buried tanks, and

surface and subsurface soil sampling to evaluate the potential extent of contamination from past activities. The areas investigated by AECOM were based on nine RECs identified in the URS Phase I ESA report, and four additional Areas of Concern (AOCs). No buried tanks were located by the geophysical survey in the areas investigated north of the Subject Property. The survey identified one area of backfilled excavation adjacent to the Barn east of the Ackerman Parcel and a few hundred feet north of the Subject Property boundary. This location was not further investigated by AECOM.

- Soil samples were collected from soil borings at 5-, 10-, and 15-foot bgs. The soil sampling conducted generally did not identify elevated levels of contaminants, with the following exceptions.
  - Borings GP-18 and GP-20 were advanced adjacent to the former wash pad area east of the Ackerman Parcel and west of the South farm storage building in the Farm Operations Area. This location is approximately 250 feet north of the Subject Property boundary (see Photos 8 and 9 in Appendix B). Soil at this location was found to have elevated levels of petroleum hydrocarbons up to 25,000 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH) in the mineral oil range, exceeding the 1,000 mg/kg screening levels. It appears that the contamination may be in the top 5 feet at this location. In addition, the washwater was historically discharged to a ditch at this location and a sample collected from the sediment at this location had TPH as mineral oil levels up to 93,000 mg/kg.
  - Soil boring GP-10 and sediment sample SS-4 were collected near the stained area adjacent to the southeast end of the crop duster airstrip (see photos 10 to 12 in Appendix B). No petroleum hydrocarbons or volatile organic compounds (VOCs) were detected at this location with the exception of benzene detected in sediment sample SS-4 at a concentration of 2.1 micrograms per kilogram. Low concentrations of several pesticides were detected in sediment sample SS-4, but not in GP-10. Concentrations of potassium, nitrate, sulfate, and phosphate were detected above background in the soil samples collected from boring GP-10 and sediment sample SS-4. In addition, the 5-foot sample collected at GP-10 had a pH of 3.85.
  - In order to evaluate pesticide concentrations in surficial soil, AECOM collected nine sets of 5-point composite samples, including five sets on the Subject Property and four in adjacent parcels. These samples were analyzed for organochlorine pesticides by U.S. EPA Method 8081, and were not analyzed for organophosphorous pesticides or herbicides. Endrin, endosulfan, and dieldrin are present in composite samples SC-1, SC-4, and SC-8 at concentrations that exceed the RWQCB Environmental Screening Levels (ESLs), but did not exceed the California Human Health Screening Levels (CHHSL) or Regional Screening Levels (RSL). SC-1 and SC-4 were located on the Subject Property, and SC-8 on the agricultural fields to the south. These results are consistent with the historical agricultural use. No consistent spatial pattern of pesticides above ESLs was observed.

- AECOM identified and investigated an additional AOC along Adohr Road due to a historical spill from the oil pipeline adjacent to the north side of the road, which was verbally reported by Mr. Sam Ackerman. No evidence of significant contamination was noted, and the historical spill location is approximately 0.5 mile north of the Subject Property
- The AECOM Phase II ESA noted heavy metals concentrations in soil that generally appear to be consistent with naturally occurring heavy metal concentrations in soil.
- Groundwater was not encountered during the Phase II ESA; however, AECOM was not able to advance borings beyond approximately 40 feet bgs. In addition, groundwater was not encountered at depths of up to 101 feet bgs by URS in January 2009.
- The Phase II investigation collected at least one sample at 5 feet bgs from each of the 9 areas identified as RECs in the URS 2010 Phase I ESA. The results from the soil samples collected in the vicinity of the RECs indicate that soil impacts are generally confined to the upper 5 feet. Based on this information, AECOM's investigation concluded that no other significant contamination was detected, in addition to the issues described above. The majority of the investigation covered the Farm Operations Area north of the Subject Property.



## 4.1 REGULATORY RECORDS

### 4.1.1 Regulatory Database Search Report

An EDR Radius Map Report was prepared for the Subject Property on March 19, 2012, in accordance with ASTM recommended guidelines, and is included as Appendix D. The EDR report presents the results of a search of federal and state databases, along with a description of each database, that list addresses of sites with known USTs; landfills; hazardous waste generation or TSDFs; and subsurface contamination in the surrounding area.

The goal of reviewing the database report is to identify facilities that have known and documented environmental conditions that may negatively impact the Subject Property.

Table 4-1 summarizes the database information provided by EDR with respect to hazardous substances and wastes on or near the Subject Property. Appendix D includes the complete regulatory database search report, which presents larger search radii because additional coverage was requested from EDR to provide additional information about the Subject Property vicinity. Table 4-1 lists sites within the ASTM search radii from the boundary of the Subject Property identified in the respective databases searched by EDR.

**Table 4-1  
Federal Databases Searched by EDR**

Type of Database	Description of Database/Effective Date	Search Radius	Number of Sites Identified
NPL	NPL of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the U.S. EPA Superfund program.	1.5 mile	0
CORRACTS	RCRA TSDf ordered to implement corrective actions.	1.5 mile	0
CERCLIS	The CERCLIS database identifies hazardous waste sites that require investigation and possible remedial action to mitigate potential negative impacts on human health or the environment.	1 mile	0
FINDS	The Facility Index System (FINDS) database contains both facility information and pointers to other sources that contain more detail.	0.5 mile	1
RCRA TSDFs	Identifies RCRA TSDFs.	1 mile	0
ERNS	U.S. EPA's ERNS list contains reported spill records of oil and hazardous substances.	Target Property	0
RCRA Generators	RCRA regulated hazardous waste generator list; both Large- and Small-Quantity Generators are included in this list.	0.75 mile	0
MINES	Federal database containing all mine identification numbers issued for mines opened since 1971.	0.75 mile	0
DOD	Federal database for Department of Defense sites consisting of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres.	1.5 mile	1
LUST	List of information pertaining to reported LUST investigations.	1 mile	0
UST	State database of active USTs.	0.75 mile	0
AST	State database of registered ASTs.	0.75 mile	1
CA BOND EXP. PLAN	Bond Expenditure Plan – Department of Health Services expenditure plan for appropriation of Hazardous Substance Cleanup Bond Act funds.	1.5 mile	0
HIST UST	Hazardous Substance Storage Container Database – historical listing of UST sites.	0.75 mile	2

**Table 4-1  
Federal Databases Searched by EDR (Continued)**

Type of Database	Description of Database/Effective Date	Search Radius	Number of Sites Identified
SWEEPS UST	Statewide Environmental Evaluation and Planning System – underground storage tank listing updated and maintained by a State Water Resources Control Board contractor in the early 1990s.	0.75 mile	1
SCH	School Property Evaluation Program – proposed and existing school sites evaluated by California Department of Toxic Substances Control (DTSC) for possible hazardous materials contamination.	0.75 mile	0
TOXIC PITS	Toxic Pits Cleanup Act Sites – identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.	1.5 mile	0
SWF/LF	State inventory of solid waste disposal facilities or landfill sites, includes both active and inactive historical landfills.	1 mile	0
WMUDS/ SWAT	Waste Management Unit Database System – used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units.	1 mile	0
CA WDS	Waste Discharge System – addresses sites which have been issued waste discharge requirements.	Target Property	0
CORTESE	Hazardous Waste & Substances Sites List – listed sites are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).	1 mile	0
SWRCY	Recycler Database – listing of recycling facilities in California.	1 mile	0
CA FID UST	Facility Inventory Database – contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board.	0.75 mile	0
SLIC	Statewide SLIC Cases (Spills, Leaks, Investigations and Cleanup) – designed to protect and restore water quality from spills, leaks, and discharges.	1 mile	0
ENVIRO- STOR	EnviroStor Database DTSC's Subject Property Mitigation and Brownfields Reuse Program – database that identifies sites that have known contamination or sites for which there may be reasons to investigate further.	1.5 mile	0
LIENS	Environmental Liens Listing – listing of property locations with environmental liens for California.	Target Property	0
CHMIRS	California Hazardous Material Incident Report System – information on reported hazardous material incidents (accidental releases or spills).	Target Property	0
Notify 65	Proposition 65 Records – facility notifications about releases that could impact drinking water.	1.5 mile	0



**Table 4-1  
Federal Databases Searched by EDR (Continued)**

Type of Database	Description of Database/Effective Date	Search Radius	Number of Sites Identified
DEED	Deed Restriction Listing Subject Property Mitigation and Brownfields Reuse Program – sites cleaned up under the program's oversight.	1 mile	0
VCP	Voluntary Cleanup Program Properties – low threat level properties with confirmed or unconfirmed releases and requested that DTSC oversee investigation and/or cleanup activities.	1 mile	0
DRY CLEANERS	Cleaner Facilities – drycleaner related facilities with U.S. EPA ID numbers.	0.75 mile	0
WIP	Well Investigation Program Case List – cases in the San Gabriel and San Fernando Valley area.	0.75 mile	0
CDL	Clandestine Drug Labs – drug lab locations.	Target Property	0
RESPONSE	State Response Sites – identifies confirmed release sites where DTSC is involved in remediation.	1.5 mile	0
HAZNET	Facility and Manifest Data – data extracted from hazardous waste manifests received by the DTSC.	0.5 mile	0
EMI	Emissions Inventory Data – toxics and criteria pollutant emissions data collected by the Air Review Board and local air pollution agencies.	0.5 mile	2
HAULERS	Registered Waste Tire Haulers Listing – listing of registered waste tire haulers.	0.5 mile	0

Source: EDR Report, 2012.

Each database searched by EDR is referenced in Appendix D. The results of the records review are presented in the EDR report and are summarized below.

### *Subject Property*

No database listings were mapped for the Subject Property by EDR.

### *Subject Property*

No database listings were mapped for the Subject Property by EDR.

### *Adjacent Property*

The EDR report identified the following listings adjacent to the Subject Property; however, it should be noted that database listings may be incorrectly plotted due to the poor address accuracy in the area:

- Two historical (HIST) USTs are listed in the HIST UST database near (vicinity of Adohr Road and Tupman Road), with the listed owner as “Palm Farms.” From information

provided in the HIST UST database by EDR, Palm Farms, Inc., was listed as having five tanks, storing diesel fuel in two of the tanks, and unleaded, regular, and premium (each in single tanks) for the purposes of farming. Due to limited address information in the HIST UST database, the location of these historical USTs could not be determined from the database, and the historical aerial photographs showed only crops and roadway in this area. The UST database identified Mr. Sam Ackerman as the contact name for the historical USTs at Palm Farms. Therefore, HECA LLC subsequently contacted Mr. Sam Ackerman on July 18, 2010, and HECA LLC provided the following information to URS: Mr. Ackerman recalled that three USTs were previously located on the portion of the Subject Property that is owned by Mr. John Cauzza III, east of the fenceline between the Ackerman and Cauzza properties. He recalled that in 1984, these three tanks were removed due to the federally mandated upgrade requirements for all USTs. Mr. Ackerman did not know of any records regarding the removal of the USTs. Mr. Ackerman also recalled two USTs near the airstrip, located partially on the northeastern corner of the Subject Property and partially on the adjacent property. Mr. Ackerman did not know if these two tanks had been removed. The suspected locations of these tanks were investigated during the 2010 AECOM Phase II ESA as described in Section 3.2.

- The SWEEPS UST database lists five 5,000-gallon diesel USTs registered to Palm Farms in 1985. This listing is likely to be a duplicate of the historical USTs described above.
- The AST database lists a 31,120-gallon unspecified AST registered to Cauzza John & Laura. No further details on the type, contents, or condition of this AST are provided in the database listing. This listing is likely to be for the diesel AST located in the Farm Operations Area.

### *Surrounding Properties*

In addition to the above listings, the following nearby listings were identified during the database review:

- Three listings on the EMI and FINDS databases for Western Milling and Shanco Commodities at 7361 Adohr Road appear to refer to air permits for particulate matter. These listings were mapped approximately 371 feet south of the Subject Property; however, no permanent structures are apparent in the area. This air emissions listing is not considered to be an environmental concern to the Subject Property.
- The Department of Defense (DOD) list, as provided to EDR, revealed that there is one DOD site located at a higher elevation and within approximately 1 mile southwest of the Subject Property boundary. This site is the Elk Hills Oil Field, which was formerly known as the Naval Petroleum Reserve. No details of the potential nature of contamination are available from the database; however, the site is not cross-listed on contaminated site databases. Based on the lack of known releases, the distance, and the location across the Kern River flood control channel, this site is not likely to pose an environmental threat to the Subject Property.

- A HIST UST listing is identified as Martin Snow Farm (EDR address: “Station Rd, ¼ Mile east of”), located approximately 0.1 mile east of the northeastern corner of the Subject Property. This location is consistent with the location of a small farmhouse located near the intersection of Tupman Road and Station Road. The database lists Martin Snow Farm as having two tanks installed in 1970 that were used to store diesel fuel and unleaded gasoline for the purposes of farming. The site is not listed on UST release databases. Based on the lack of known releases, the distance, and the cross-gradient location, this site is not likely to pose a significant environmental threat to the Subject Property.

### *Orphan Sites*

Due to poor or inadequate address information, EDR is not always able to map all sites that have environmental concerns. These listed, but unmapped, properties are referred to as orphan sites. Although the orphan sites are not mapped, EDR searches the same databases that they do for mapped sites, and provides relevant information if an orphan site is found on one of the databases. EDR identified 57 orphan sites in the database report. URS attempted to locate the orphan sites listed and measure their distance from the Subject Property. Based on partial address information, URS concluded that 51 orphan sites identified by EDR were located outside the ASTM recommended survey radius in reference to the Subject Property. Two addresses were located at unmapped locations on Tupman Road: a Chevron pipeline company listing for hazardous waste shipments, and Weatherford listing for a 3,000-gallon AST. Neither listing is indicative of a release, and no Chevron or Weatherford sites were noted along Tupman Road in the vicinity of the Subject Property during the site visit. The four remaining sites could not be located based on partial information.

## 4.2 USER-PROVIDED INFORMATION

As part of the ASTM 1527-05 standard, the following additional inquiries were made to HECA LLC representatives as the report “users”:

1. Identification of environmental cleanup liens against the subject property;
2. Specialized knowledge or experience regarding the subject property;
3. Relationship of the purchase price to the fair market value if the subject property was not contaminated;
4. Commonly known or reasonably ascertainable information regarding the subject property; and
5. Degree of obviousness of the presence or likely presence of contamination at the subject property.

According to HECA LLC representatives, no environmental issues, environmental cleanup liens, or previous reports exist except for those discussed in this 2010 Phase I ESA of the HECA Controlled Area and Ackerman Property prepared by URS and the 2010 Phase II Investigation Report prepared by AECOM.

## 5.1 LOCAL GOVERNMENT/REGULATORY AGENCY REPRESENTATIVES

URS contacted the KCEHSD, Hazardous Materials Division, and the KCFD for information regarding the Subject Property. In addition, URS requested files from Cal-EPA and performed searches of the online site databases for the Cal-EPA and RWQCB to identify any files regarding the Subject Property. Information and files obtained during the URS 2009 Phase I ESA of the HECA Project Site are also presented in this section.

### 5.1.1 Kern County Environmental Health Services Department

URS conducted a file review at the KCEHSD, Hazardous Materials Division, on July 8, 2010. URS contacted the KCEHSD in March 2012 concerning any new information regarding hazardous materials and hazardous waste activity at the Subject Property. No response has been received to date regarding new information available from the KCEHSD. If material information is received by URS, it will be provided in an addendum to this report. The reviewed files confirmed the results of the file review performed as part of the URS 2009 Phase I ESA of the adjacent Farm Operations Area; however, no files or information were available regarding the hazardous materials or hazardous waste at the Subject Property.

The KCEHSD files for the adjacent site to the North (Port Organics) can generally be summarized as follows:

- The Port Organics fertilizer manufacturing operation included the use of hazardous materials, including acids, bases, heavy metals, and petroleum hydrocarbons. Based on an April 12, 2005 inspection, KCEHSD concluded that the operations were generally not in compliance with applicable hazardous materials and hazardous waste regulations. The inspection report included photographs of the facility taken during the inspection. The photographs illustrate the relatively poor chemicals management practices and the fragmented state of the concrete catch basin in the storage area. Subsequently, Notices of Violations (NOVs) were issued to Port Organics.
- Follow-up inspections by California Accidental Release Prevention Program (CalARP) and KCEHSD on January 25, 2007, and KCEHSD on November 12, 2008, resulted in a reduced list of compliance issues.
- February 2006 and February 2008 HMBPs for Port Organics detail the amounts of stored chemicals at the site, which included over 12,000 pounds of aqueous ammonia, over 90,000 pounds of sulfuric acid, over 32,000 pounds of phosphoric acid, over 300,000 pounds of various inorganic salts, 40,000 gallons of liquid fish base, and over 40,000 gallons of liquid organic fertilizer product (“Agrolizer” and “Fishilizer”). A list of 73 notes, prepared by Port Organics, was also on file, detailing the nature and uses of various on-site storage and transfer equipment.

- In March 2008, KCEHSD issued a Consent Order with a proposed settlement fee of \$9,238.50 for the just-described compliance issues. The Consent Order was signed by KCEHSD and a Port Organics representative.

The KCEHSD files for “Palm Farms” and “Palm Ranch” appear to be for the Farm Operations Area north of the Subject Property. These files describe the 1989 and 2010 hazardous materials storage at the Farm Operations Area, including the following:

- An August 1989 survey drawing showing four tanks labeled diesel (2×), gasoline, and propane. No indication is given as to whether these tanks were aboveground or belowground. However, the largest diesel tank shown matches the current diesel AST south of the maintenance shop.
- A February 2010 HMBP for the Farm Operations Area, indicating maximum on-site storage of 2 × 500 gallons waste oil, 3 × 1,000 gallons and 1 × 10,000 gallons propane, 2 × 5,000 gallons and 4 × 1,000 gallons diesel, 500 gallons gasoline, 4,800 pounds fungicide Vitavax, and 3,100 pounds red seed dye.
- The KCEHSD also noted that a wastewater drain pipe in the southeastern area of the Farm Operations Area was discharging into a nearby drainage ditch used by other farmers (see Section 6.3.4, below).

Copies of files obtained from the KCEHSD during the URS 2009 and 2010 Phase I ESAs are provided in Appendix G.

### 5.1.2 Kern County Fire Department

URS contacted the KCFD on June 7, 2010, concerning potential hazardous materials and hazardous waste activity at the Subject Property. In a July 5, 2010, telephone call, KCFD Deputy Fire Marshall Mike Cody stated that KCEHSD was the appropriate place to investigate for the requested information, rather than his department. URS contacted the KCFD in March 2012, concerning any new information regarding hazardous materials and hazardous waste activity at the Subject Property. No response has been received to date regarding new information available from the KCFD. If material information is received by URS, it will be provided in an addendum to this report.

### 5.1.3 Cal-EPA Department of Toxic Substances Control

On January 29, 2009, URS contacted Mr. Alex Baillie, Hazardous Substance Scientist with the California Department of Toxic Substances Control (DTSC) Statewide Compliance and Oversight Enforcement Branch, who stated that the DTSC did not have information on the Subject Property and was not aware of any hazardous material incident or oil spill reported at the Subject Property. URS contacted the DTSC in March 2012, concerning any new information regarding hazardous materials and hazardous waste activity at the Subject Property. The DTSC responded that there was no new information on the Subject Property.

URS searched the Cal-EPA DTSC EnviroStor database for any records on the Subject Property. There were no records found for the Subject Property when searched by county (Kern), town (Buttonwillow), zip code (93206), or using the names/phrases “Cauzza,” “Port Organics Products, LTD,” or “Palm Farms, Inc.”

#### **5.1.4 Regional Water Quality Control Board**

URS contacted the RWQCB concerning any files for the Subject Property. As of the date of this report, no response was received from the agency. URS will provide any information received by the agency in an addendum to this report.

URS searched the RWQCB GeoTracker database for any records on the Subject Property. There were no records found for the Subject Property when searched by county (Kern), town (Buttonwillow), zip code (93206), or using the names/phrases “Cauzza,” “Port Organics Products, Ltd,” or “Palm Farms, Inc.”

#### **5.1.5 U.S. Environmental Protection Agency**

URS contacted the U.S. EPA concerning any files for the Subject Property. On March 19, 2012, the U.S. EPA responded that they had no file for the Subject Property.



## 6.1 METHODOLOGY AND LIMITING CONDITIONS

URS performed a site reconnaissance at the Subject Property on February 8, 2012 and interviewed Mr. John Cauzza III and Mr. Sam Ackerman during the site visit. URS staff were not accompanied during the majority of the site visit. The Subject Property was observed by walking the perimeter and internal areas on established roadways. URS staff did not walk through cultivated fields; however, all portions of the fields were visible from the roadways. Areas inaccessible during the site visit are listed in Section 1.3. Appendix B includes photographs taken during site reconnaissance.

## 6.2 GENERAL SETTING

The Subject Property is between the intersections of Dairy Road, Adohr Road, and Tupman Road in Kern County, California.

The elevation of the Subject Property is approximately 288 feet above mean sea level. The Subject Property occupies an area of approximately 453 acres. The Subject Property primarily consists of cultivated agricultural land with irrigation ditches. No buildings were noted on the Subject Property during the site reconnaissance.

The properties surrounding the Subject Property include a Farm Operations Area to the north, followed by Adohr Road; to the east Tupman Road; and to the west the Dairy Road right-of-way that forms the western border of the Subject Property. An operating ranch and ranch house are east of the Subject Property across Tupman Road. The West Side and Outlet canals are south of the Subject Property, generally extending from the southeast to northwest. Beyond these is the Kern River Flood Control Channel, which appeared as arid vegetation during the site visit. The California Aqueduct lies to the south of this flood channel. The Aqueduct extends generally from the southeast to northwest and is positioned parallel to and south of the West Side and Outlet canals. The Tule Elk State Reserve is located approximately 0.25 mile east of the Subject Property, east of Tupman Road. The reserve extends generally from the north to the south, with Station Road forming the northern boundary. The reserve's southern boundary is just east of the community of Tupman, California. The locations of several of these features are shown on Figure 2.

The Farm Operations Area north of the Subject Property extends over approximately 30 acres and houses the only structures adjacent to the Subject Property. The former Port Organics fertilizer manufacturing plant (comprising approximately 3.5 acres) is on the eastern side of the Farm Operations Area. The area used for the fertilizer manufacturing plant was leased to Port Organics in the past, and their operations ceased at the beginning of 2009. At the time of this Phase I ESA, no documentation of closure or decommissioning was found in the KCEHSD records; however, all containers and the majority of the tailings piles had been removed from the site prior to the URS 2012 site visit.



### 6.3 INTERIOR AND EXTERIOR OBSERVATIONS

#### 6.3.1 Structures, Grounds, and Subject Property Access

Access to the Subject Property is via Dairy, Adohr, Station, and Tupman Roads. Numerous dirt roads are established on the Subject Property, traversing and bordering the cultivated fields and irrigation ditches.

There are no structures on the Subject Property.

#### 6.3.2 Water, Utilities, Pipelines

Pacific Gas and Electric Company (PG&E) provides electricity to the areas adjacent to the Subject Property. Overhead electrical lines and pole-mounted transformers serve buildings in the Farm Operations Area, and stand-alone well pumps south of the Subject Property. No overhead lines and pole-mounted transformers were noted on the Subject Property itself; but the EDR report identifies on high-voltage transmission line over the Subject Property.

No public water or sewer service is provided to the Subject Property. According to Mr. John Cauzza III, irrigation water is provided by the Buena Vista Water Storage District. Several wells are located adjacent and in close proximity to the Subject Property and are used to replenish water in the irrigation canals. Three wells plugged with concrete were noted south of the Subject Property. Two domestic water supply wells are currently present on the Farm Operations Area north of the Subject Property, as described in Section 6.3.3, below. According to Mr. John Cauzza III a water line traverses the Subject Property to the east towards an offsite well in the Station Road area. In addition, an unknown 2-inch steel pipe was noted in the embankment for the drainage canal on the northernmost portion of the Subject Property.

An oil pipeline runs north of the Subject Property (originating at the intersection of Adohr and Tupman Roads, and extending to the east from the point of origination. A lone pipeline marker was noted during site visit on the northern side of Adohr Road, east of the landing strip and west of Tupman Road.

#### 6.3.3 Wells

As noted in Section 6.3.2, several wells are located adjacent to the south of the Subject Property and are used for irrigation.

Domestic water wells serve the adjacent parcels to the north.

According to the EDR report, two groundwater wells are located on the Subject Property (in the central portion of the Subject Property), and an additional nine wells are located within 0.5 mile of the property boundary. The two wells mapped in agricultural fields on the Subject Property were not visible during the URS site visit.

The EDR report listed two DOGGR-registered oil and gas wells that are located within a 1-mile radius of the Subject Property. One of these wells is located on the Subject Property, to the south-southeast of the center point of the Subject Property, as shown in Appendix D. EDR reported that the wells on the Subject Property were plugged and abandoned (dry holes).

The former well locations were approached during the site reconnaissance and observed from the nearest roadway to avoid damaging crops. No evidence of these former wells was noted during the 2010 or 2012 site visits.

#### **6.3.4 Wastewater Discharge**

No public sewer is provided to the Subject Property. According to Mr. John Cauzza III, no septic tanks and associated leach fields are present on the Subject Property; however, four are present in the adjacent Farm Operations area to the north. In addition, Mr. Ackerman stated that his residence is served by a septic tank and leach field north of the Subject Property.

No wastewater discharges from the Subject Property were noted. Agricultural irrigation runoff is collected in the drainage canal that runs through the center of the Subject Property.

No surface water discharges from the Farm Operations Area adjacent to the north were noted during the URS 2012 site visit, with the exception of agricultural irrigation runoff.

#### **6.3.5 Stormwater Drainage/Discharge**

Generally, stormwater generated on site would sheet flow to the nearest irrigation or drainage ditch or to the West, East, or Outlet canals. No stormwater permits are held by Mr. John Cauzza III for the farm operations. Mr. John Cauzza III stated that the Buena Vista Storage Water District holds a discharge permit for the drainage canals, and conducts water testing.

The Subject Property is generally flat and gently slopes to the west, toward the West Side Canal. From observation of the Subject Property, it does not appear that stormwater is generated in concentrated flows.

#### **6.3.6 Drains and Sumps**

No drains or sumps were noted on the Subject Property during the site reconnaissance. Irrigation drainage canals are described in Section 6.3.5, and shown on Figure 2.

#### **6.3.7 Solid Waste Disposal**

There are no designated waste storage areas established in the Subject Property. Agricultural wastes generated by crop planting and harvesting activities are removed from the areas upon generation. Solid wastes are also generated and stored in the Farm Operations Area adjacent north of the Subject Property. In addition, broken concrete and debris were observed in the irrigation ditches used to prevent scouring and reinforce the ditches.

#### **6.3.8 Process Equipment**

No process equipment was present on the Subject Property.

#### **6.3.9 Underground Storage Tanks**

As described in the “Subject Property” subsection of Section 4.1.1, the EDR report did not identify any existing or historical USTs associated with the Subject Property; however, the EDR report noted 5 historical USTs reported as owned by Palm Farms on Adohr Road, with no

address specified. Based on conversations with Mr. Sam Ackerman, at least three of these five tanks were on the Farm Operations Area north of the Subject Property, and the other two tanks may have been near the airstrip north of the Subject Property. Mr. Sam Ackerman reported that three of the USTs were removed in the 1980s, and he is not aware if the remaining two tanks were removed or are still present. Mr. Sam Ackerman was not aware of any current or historical USTs on the Subject Property. Mr. John Cauzza III reported that he was not aware of any current or historical USTs on his former portion of the Subject Property. As discussed in Section 3.2 AECOM performed a geophysical survey in 2010 to attempt to locate the potential USTs and could not find them in the areas searched (AECOM, 2010).

During the site reconnaissance, URS did not note any fill or vent pipes suggesting the potential presence of USTs on the Subject Property.

Two unknown large concrete covers were noted west of the south storage building, and Mr. John Cauzza III could not provide any information regarding the nature or former use of these structures. There is a potential that these covers are associated with USTs or septic tanks. According to Mr. Sam Ackerman, they may have been used as part of the equipment maintenance and washing operations that were historically conducted in this area. As discussed in Section 3.2, AECOM advanced a single boring adjacent to these features in 2010 to assess potential impacts from them, and no petroleum hydrocarbons were detected in the soil samples collected (AECOM, 2010).

#### **6.3.10 Aboveground Storage Tanks**

No ASTs were noted on the Subject Property.

#### **6.3.11 Other Hazardous Materials/Waste Storage**

No hazardous materials or wastes were noted on the Subject Property during the URS 2012 site visit.

#### **6.3.12 Pits, Ponds, and Lagoons**

There are no pits, ponds, or lagoons on the Subject Property. Irrigation and drainage canals operated by the Buena Vista Storage Water District are present on and adjacent to the Subject Property.

#### **6.3.13 Stained/Discolored Soil or Pavement**

Stained soils were observed at the following location on the Subject Property during the February 2012 site visit:

- In the apparent pesticide loading or washing area on the southeastern end of the crop duster landing strip (Photo 11).

No other stained soils were observed on the Subject Property; however, soil staining was noted on adjacent properties to the south (associated with water pump oil and diesel) and north (associated with operations at the Farm Operations Area, the former crop duster hangar, and water pumps in this area).

#### **6.3.14 Evidence of Fill or Illegal Dumping**

No evidence of unauthorized or potentially illegal dumping was observed on the Subject Property during the 2012 site visit.

Mr. John Cauzza III was not aware of any fill that had been brought on site in the past. Mr. Ackerman noted that sandy fill was imported as a foundation for the Ackerman residence north of the Subject Property.

#### **6.3.15 Transformers/PCB Items**

Numerous pole-mounted transformers were observed on parcels adjacent to the Subject Property, but none were noted on the Subject Property. No other potential polychlorinated biphenyl (PCB)-containing items were observed on the Subject Property.

#### **6.3.16 Air Emissions**

Air emission sources include farm tractors and other mobile farm equipment, and diesel-powered irrigation pumps. No permits exist for this equipment. According to San Joaquin Valley Air Pollution Control District rules, farm tractors and other off-road mobile equipment do not require an air permit. Permits are not required for stationary diesel-powered irrigation pumps that are under 50 horsepower. The air permit status of these small emission sources is not considered a significant environmental issue for the purpose of this Phase I ESA. No significant issues were noted with respect to air emissions at the Subject Property.

#### **6.3.17 Asbestos-Containing Materials**

URS did not conduct an asbestos survey at the Subject Property, as explained in Section 1.3; however, during the 2012 site visit, URS did not note building materials on the Subject Property, with the exception of concrete rubble placed in the irrigation ditches.

#### **6.3.18 Lead-Based Paint**

No painted surfaces were noted on the Subject Property.

#### **6.3.19 Radon**

There are no federal or state standards regulating radon exposure; however, the U.S. EPA recommends a maximum exposure level of 4.0 picocuries per liter (pCi/L). Mr. John Cauzza III and Mr. Ackerman were not aware of any radon testing conducted at the Subject Property. URS did not conduct radon sampling during the Subject Property visit. The Subject Property is located in Kern County within U.S. EPA Radon Zone 2, according to the EDR. Properties located in U.S. EPA Radon Zone 2 have a moderate potential to have radon concentrations greater than 2 but less than 4 pCi/L.



The Subject Property consists of approximately 453 acres of land described in Section 2.1, located west of Tupman Road and south of Adohr Road in unincorporated Kern County near Buttonwillow, California.

In performing this ESA and based on the site reconnaissance, review of available documents, and interviews with Mr. John Cauzza III, Mr. Sam Ackerman, and Mr. Dane Peacock, URS identified the following environmental conditions in connection with this Subject Property:

- EDR reported a record of five USTs in the HIST UST database described as Palm Farms, Inc., including two diesel fuel tanks, an unleaded gasoline tank, a regular gasoline tank, and a premium gasoline tank. The address reported for Palm Farms, Inc., is Adohr Road, mapped by EDR as approximately 0.985 mile north-northeast of the Subject Property, according to the EDR HIST UST list from 1990. Based on a conversation with Mr. Sam Ackerman, at least three of these USTs were located on the Farm Operations Area north of the Subject Property, and were removed in 1984. Mr. Ackerman reported that two USTs may be on the adjacent crop duster hangar area, and might not have been removed. These potential UST areas were investigated in 2010, and the USTs could not be located, as discussed in Section 3.2.
- Although the former property owner, Mr. John Cauzza III, reported that he was not aware of any USTs being historically located at the Subject Property, a pipe that may be a UST fill or vent pipe was reported by URS in the 2009 and 2010 Phase I ESAs in the Farm Operations Area north of the Subject Property (as discussed in Section 6.3.9). In addition, two unknown large concrete covers were noted west of the south storage building. Mr. John Cauzza III was aware of these underground structures, but he does not know their nature or details on their former use. Both of these areas were investigated in 2010 and no evidence of releases was found as discussed in Section 3.2.
- Stained soils were observed adjacent to the crop duster landing strip during the Subject Property visit, as detailed in Section 6.3.13. The soil staining is likely to derive from handling of fuels, lubricating oils, and/or pesticides. This area was investigated in 2010 and no significant contamination was found; however, the extent of subsurface impacts does not appear to be defined vertically or horizontally.
- A portion of the Subject Property has been used for agriculture, and agricultural chemicals such as pesticides and herbicides were applied to crops over time. URS noted no specific evidence of stains or storage related to agricultural chemicals, with the exceptions noted in the stained soils above. Surface soils in five areas on the Subject Property were sampled in 2010 to evaluate concentrations of pesticides. The organochlorine pesticides dieldrin, endrin, and endosulfan were detected above industrial screening levels (RWQCB ESLs) in selected samples, but did not exceed other state or federal screening levels (CHHSLs or RSLs). The pesticide results are discussed in more detail in Section 3.2.
- The EDR database search identified one former oil and gas well on the Subject Property that was reported as abandoned in the 1950s. URS visited the reported location of the well during the June 2010 and February 2012 site visits and found no evidence of the well. The history and abandoned status of these wells is documented by DOGGR.

URS did not encounter significant data gaps in performing this ESA, with the exception of the following:

- Time intervals greater than 5 years between historical maps and resources; however, based on the nature of the site use as agricultural fields and the site history available from sources dating back to 1912, this data gap does not appear to be significant.
- Selected environmental agencies have not provided updates on their files regarding the Subject Property at the time this report was prepared. Since the agency files were last reviewed in 2010, it is unlikely that significant new information is available; however, an addendum to this report will be issued if significant information is received from these agencies.

URS has performed an ESA of the Subject Property described in Section 1, located on Adohr Road in unincorporated Kern County, California. Our work was conducted in conformance with the scope and limitations of ASTM Practice E 1527-05. Any exceptions to, or deletions from, this practice are described in Section 1.3, Limitations and Exceptions. This ESA identified the following RECs:

- The 2010 Phase II investigation identified elevated concentrations of petroleum hydrocarbons and other contaminants on the former equipment wash area immediately north of the Subject Property boundary. Because the vertical and horizontal extent of contamination were not defined by the Phase II ESA, and this wash area discharged into a ditch south of the Farm Operations Area boundary, the contamination is considered a potential offsite REC to the Subject Property.
- Stained soils were observed during the Subject Property visit, as detailed in Section 6.3.13. The soil staining is likely to derive from handling of fuels, lubricating oils, and/or pesticides. The AECOM 2010 Phase II ESA sampled in the vicinity of the stained soil and identified selected contaminants; however the extent of any subsurface impacts is not defined.

In addition to the above RECs the following potential environmental issues were noted: in the opinion of URS, they are not considered RECs:

- Surficial samples collected from the agricultural fields on the Subject Property identified levels of pesticides dieldrin, endrin, and endosulfan at concentrations that exceed the RWQCB ESLs, but did not exceed the state CHHSL or federal RSLs. These results are consistent with the historical agricultural use, and no consistent spatial pattern of pesticides above ESLs was observed.
- An agency database lists five former USTs located at Palm Farms, Inc., on Adohr Road. Because the Subject Property is also located on Adohr Road, and the property was purchased from Palm Farms, Inc., the USTs may have historically been located on or adjacent to the Subject Property. The 2010 AECOM Phase II ESA investigated selected potential locations for these USTs and identified no USTs and no contamination associated with USTs.





- AECOM, 2009. *Results of Soil Sampling Activities Proposed Subject Property near the Intersection of Dairy Road and Adohr Road, Buttonwillow, California*, September 9.
- AECOM, 2010. *Phase II Environmental Site Assessment Report, Proposed Hydrogen Energy California Project Site, Adohr and Dairy Roads, Kern County, California*, December.
- American Society for Testing Materials (ASTM). 2005. Standard Practice for Environmental Subject Property Assessments: Phase I Environmental Subject Property Assessment Process: Designation E 1527-05.
- Cal-EPA GeoTracker database. <http://www.geotracker.waterboards.ca.gov/>. Searched on March 16, 2012.
- Environmental Data Resources, Inc. (EDR), 2012. *Radius Map with GeoCheck®: Inquiry Number: 3251004.1s*, EDR, Inc., Milford, Connecticut. March 19.
- Environmental Data Resources, Inc. (EDR), 2010. *Historic Topographic Map Report: Report Number 2755337.44*. EDR, Inc., Milford, Connecticut. May 6.
- Environmental Data Resources, Inc. (EDR), 2010. *Sanborn Map Report: Report Number 2755383.3s*. EDR, Inc., Milford, Connecticut. April 27.
- Environmental Data Resources, Inc. (EDR), 2012. *Aerial Photograph Decade Package: Report Number 3293634.1*. EDR, Inc., Milford, CT. April 4.
- Environmental Data Resources, Inc. (EDR). 2010. *City Directory Abstract: Report Number 2785218.6*. EDR, Inc., Milford, Connecticut. June 4.
- Environmental Data Resources, Inc. (EDR), 2012. *Lien Search: Inquiry Number: 3251004.2S*. EDR, Inc., Milford, Connecticut. February 24.
- Cal/EPA Envirostor database. <http://www.envirostor.dtsc.ca.gov/>. Accessed on March 16, 2012.
- URS, 2009. *Phase I Environmental Site Assessment, HECA Project Site, Kern County, California*, April 6.
- URS, 2010. *Phase I Environmental Site Assessment, HECA Project Site, Kern County, California*, August 24.



**10.1 CORPORATE**

URS, a Nevada Corporation, provides professional services in engineering and sciences applied to the earth and its environment. One of the main areas of practice is Environmental Property Investigation and Remediation, which involves the application of science and engineering to contamination assessment and cleanup; the management, minimization, treatment, and disposal of hazardous, solid and industrial waste; and regulatory compliance. Phase I ESAs are a part of this practice area and have been conducted by URS globally for several decades.

**10.2 INDIVIDUAL**

The qualifications of the Project Manager and of the other Environmental Professionals involved in this ESA meet the URS corporate requirements for performing ESAs.

Mr. Giorgio Molinario and Mr. Zenis Walley of the URS San Francisco office performed the site reconnaissance, and Mr. Molinario authored the Phase I ESA report.

Mr. Molinario is an Environmental Chemist with more than 16 years of environmental compliance and due diligence experience. He has conducted a number of Phase I ESAs in California, the U.S., and internationally. His curriculum vitae is presented in Appendix A.

Mr. Walley is an experienced environmental compliance specialist with significant experience in Phase I ESAs at power generation facilities.

Ms. Cindy Fischer of the URS Denver office performed the internal technical review of this ESA. Ms. Fischer has over 20 years of relevant environmental professional experience.

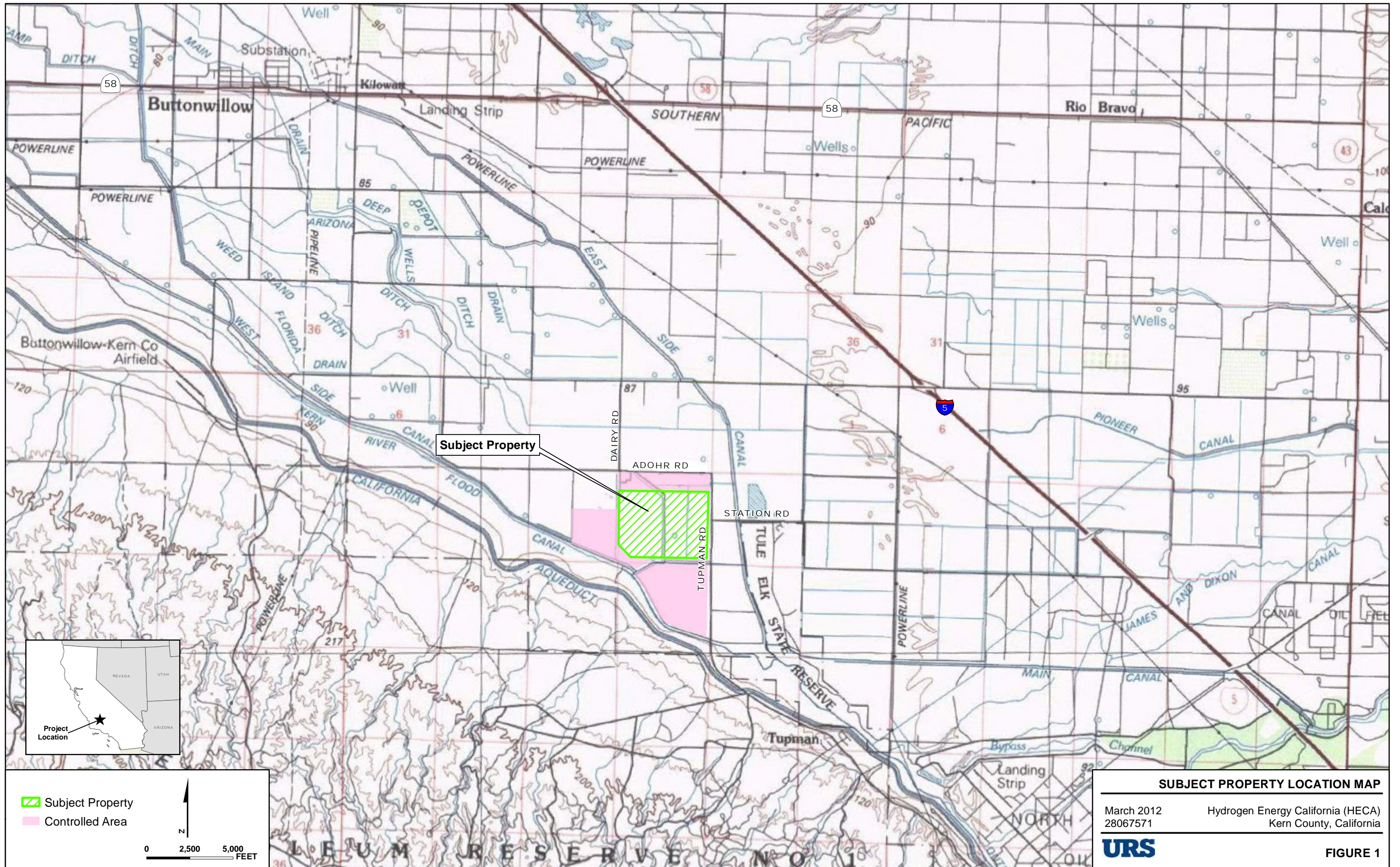


April 27, 2012

Giorgio Molinario, REA 07436







**SUBJECT PROPERTY LOCATION MAP**

March 2012  
28067571

Hydrogen Energy California (HECA)  
Kern County, California

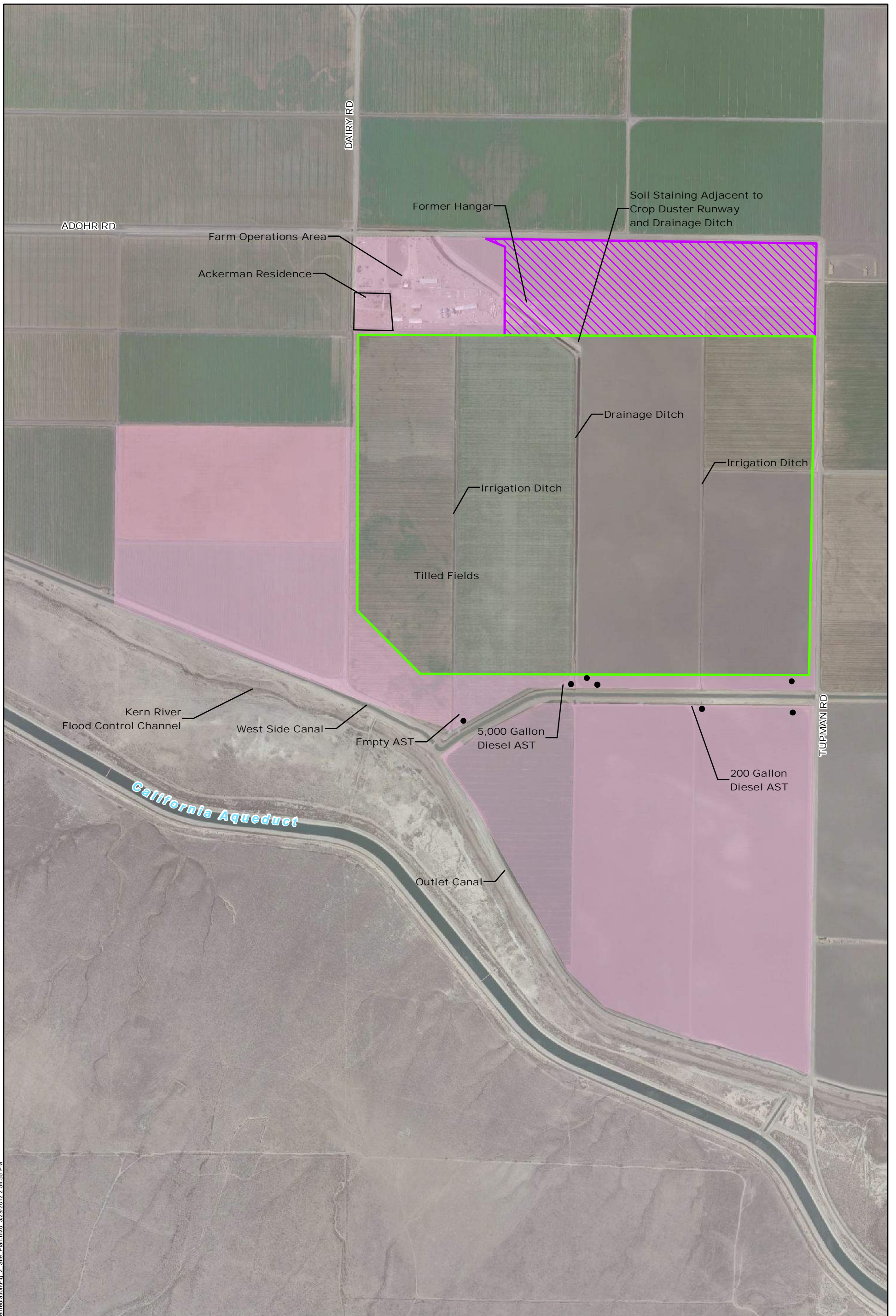


**FIGURE 1**

Sources: USGS (30"x60" quads: Taft 1982, Delano 1982). Created using TOPOI, ©2006 National Geographic Maps, All Rights Reserved. Kern County and State of California (proposed and approved projects).

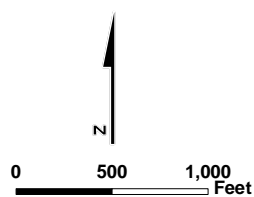






J:\GIS\HECA\Projects\HECA\_2012\Remediation\Fig\_2\_Site\_Plan.mxd 3/29/2012 2:54:55 PM  
 Source: Aerial Photo, Digital Globe, 2008.

- Irrigation Pump
- Subject Property (HECA Project Site)
- Construction Staging Area
- Controlled Area



**SITE PLAN**

---

March 2012      Hydrogen Energy California (HECA)  
 28068052      Kern County, California

**URS**

**FIGURE 2**



# **Appendix F – HECA Phase II Environmental Site Assessment**

---

---

# **Phase II Environmental Site Assessment Report**

Proposed Hydrogen Energy California  
Project Site, Adohr and Dairy Roads,  
Kern County, California

**Privileged & Confidential – Attorney Work Product/Attorney-Client Communication**



# Phase II Environmental Site Assessment Report

## Proposed Hydrogen Energy California Project Site, Adohr and Dairy Roads, Kern County, California

**Privileged & Confidential – Attorney Work Product/Attorney-Client Communication**

This report was prepared consistent with currently and generally accepted environmental consulting principles and practices. The material and data in this report were prepared under the supervision and direction of the undersigned.




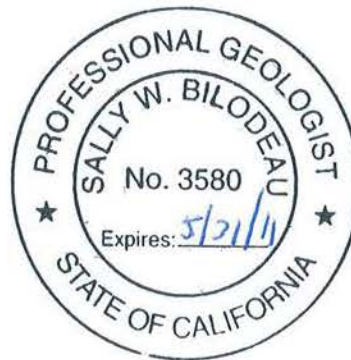
---

Jim Fickerson, REA  
Program Manager



---

Sally Bilodeau, PG, 3580  
Senior Program Manager



---

Harry Van Den Berg, PE  
Senior Program Manager

## Contents

<b>1.0 Introduction.....</b>	<b>1-1</b>
<b>2.0 Site Background.....</b>	<b>2-1</b>
2.1 Site Description.....	2-1
2.2 Site History.....	2-1
2.3 Previous Environmental Site Assessments.....	2-1
<b>3.0 Pre-Field Activities.....</b>	<b>3-1</b>
3.1 Health and Safety Plan.....	3-1
3.2 Permits.....	3-1
3.3 Utility Clearance.....	3-1
3.4 Geophysical Survey.....	3-1
<b>4.0 Field Assessment Methodology.....</b>	<b>4-1</b>
4.1 Soil Borings.....	4-1
4.2 Surface Samples.....	4-1
4.3 Sediment Sampling.....	4-1
4.4 Composite Soil Sampling.....	4-2
4.5 Groundwater Sampling.....	4-2
4.6 Sample Location Survey.....	4-2
4.7 Equipment Decontamination.....	4-2
4.8 Boring Abandonment.....	4-2
4.9 Laboratory Analyses.....	4-2
<b>5.0 Results of Assessment.....</b>	<b>5-1</b>
5.1 Site Geology.....	5-1
5.2 Groundwater.....	5-1
5.3 Field Observations.....	5-1
5.4 Geophysical Survey.....	5-1
5.5 Analytical Results.....	5-1
5.5.1 REC 1 – Five Former USTs.....	5-2
5.5.2 REC 2 – Vent Pipe/Suspect UST.....	5-2
5.5.3 REC 3 - Two Large Concrete Covers.....	5-2

5.5.4 REC 4 – Port Organics ..... 5-2

5.5.5 REC 5 – Port Organics East Sump ..... 5-3

5.5.6 REC 6 – Farm Equipment Wash Pad ..... 5-3

5.5.7 REC 7 – Outdoor Tailings Pile ..... 5-3

5.5.8 REC 8 – Indoor Tailings Pile ..... 5-3

5.5.9 REC 9 – Stained Surface Soils ..... 5-4

5.5.10 AOC 1 – Historical Pipeline Release..... 5-4

5.5.11 AOC 2 – Airport Hangar Soil Staining..... 5-4

5.5.12 AOC 3 – Suspect UST, Chemical Storage Pad, and Surface Staining ..... 5-5

5.5.13 AOC 4 – Historical Pesticide and Herbicide Use..... 5-5

5.6 Quality Assurance/Quality Control ..... 5-5

**6.0 Conclusions ..... 6-1**

**7.0 Recommendations ..... 7-1**

**8.0 Limitations ..... 8-1**

**9.0 References ..... 9-1**

## Appendices

Appendix A Geophysical Survey Report

Appendix B Borings Logs GP-1 through GP-21

Appendix C Certified Laboratory Reports & Chain-of-Custody Documentation

## List of Figures

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Geophysical Survey Map
Figure 4	Sampling Map A
Figure 5	Sampling Map B

## List of Tables

Table 1	Sampling Plan
Table 2	Summary of Analytical Results – Exceedances Only
Table 3	Summary of Detected Analytes – VOCs & TPH in Soil
Table 4	Summary of Detected Analytes – pH, Potassium, Anions, OPPS and OCPs in Soil
Table 5	Summary of Detected Analytes – Metals in Soil

## List of Abbreviations

°C	degrees Celsius
AOC	Area of Concern
bgs	below ground surface
BLI	BC Laboratories, Inc.
CHHSL	California Human Health Screening Level
CO <sub>2</sub>	carbon dioxide
COC	chain-of-custody
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
GPS	Global Positioning System
HASP	Health and Safety Plan
HECA	Hydrogen Energy California LLC
JSA	Job Safety Analyses
mg/kg	milligrams per kilogram
MW	megawatt
OCP	organo-chlorine pesticide
OPP	organophosphorus pesticides
petcoke	petroleum coke
PID	photoionization detector
ppm	parts per million
RCRA	Resource Conservation & Recovery Act
REC	recognized environmental condition
RPD	relative percent difference
RSL	Regional Screening Level
TPH	total petroleum hydrocarbons
USA	Underground Service Alert
UST	underground storage tank
VOC	volatile organic compound

## 1.0 Introduction

This report documents the results of a Phase II Environmental Site Assessment (ESA) that was recently conducted by AECOM, on behalf of Hydrogen Energy California LLC (HECA), at the proposed project site located southwest of Buttonwillow, Kern County, California. The proposed project will gasify petroleum coke (petcoke) (or blends of petcoke and coal, as needed) to produce hydrogen to fuel a combustion turbine operating in combined cycle mode. The Gasification Block feeds a 390-gross-megawatt (MW) combined cycle plant. The net electrical generation output from the Project will provide California with approximately 250 MW of low carbon baseload power to the grid. The Gasification Block will also capture approximately 90 percent of the carbon from the raw syngas at steady-state operation, which will be transported to the Elk Hills Field for carbon dioxide (CO<sub>2</sub>) Enhanced Oil Recovery, resulting in sequestration of the injected CO<sub>2</sub>. In addition, approximately 100 MW of natural gas generated peaking power will be available from the proposed project.

This Phase II ESA was conducted to evaluate recognized environmental conditions (RECs) that were identified in April 2009 and August 2010 by URS during their Phase I ESAs of the proposed project site. RECs that were identified by URS included potential former underground storage tanks (USTs), unknown concrete structures, a farm equipment wash pad, a former fertilizing manufacturing facility (Port Organics Products Ltd.), outdoor and indoor tailings piles of raw materials used by Port Organics in the fertilizer manufacturing process, and a number of locations with stained surface soil.

The following sections summarize the site background, pre-field activities, field assessment methodology, laboratory analytical program, results of the assessment, conclusions, and recommendations of this Phase II ESA.



## 2.0 Site Background

### 2.1 Site Description

The proposed project site consists of approximately 1,100 acres of agricultural land that is generally located west of Tupman Road and Station Road, southwest of the intersection of Adohr and Tupman Roads, Kern County, California. Tule Elk State Park is located approximately ¼ mile east of the proposed project site and Interstate 5 is located approximately 2.5 miles east of the proposed project site. The approximate location of the proposed project site is illustrated on Figure 1.

The proposed project site currently consists of a residence, an active farming operations area (equipment storage and maintenance), a former fertilizer manufacturing plant, a crop duster airstrip, agricultural fields, and other nominal site features. The residence, farming operations area, and former fertilizer manufacturing plant occupy approximately 45 acres that are located in the northwest corner of the proposed project site. The remaining portions of the proposed project site are occupied by alfalfa and/or cotton fields, access roads, and irrigation ditches/canals. The general locations of the main site features are illustrated on Figure 2.

### 2.2 Site History

Historical research conducted by URS indicates that the proposed project site was developed for residential and agricultural uses in the 1940s. Farming operations appear to have been concentrated around the northern portion of the proposed project site which was developed with several equipment storage and maintenance buildings. In the 1950s a crop duster landing strip was constructed to the east of the farming operations area. By the early 1970s the proposed project site was developed into its current configuration.

Occupants of the proposed project site have included a residence located at 7345 Adohr Road, Palm Farms, Inc. (also identified as Palm Ranch) and Port Organic located at 7361 Adohr Road. From at least the late 1980s, Palm Farms manufactured fertilizer on site. Sometime in the 2000s Port Organics took over operation of the fertilizer manufacturing operations. According to URS, hazardous materials utilized by Port Organics included acids, bases, heavy metals, petroleum hydrocarbons, and organic fertilizer product including "Agrolizer" and "Fishilizer." The materials were stored at various locations throughout the farming operations area, including in a former tank farm and associated concrete sumps that were located to the east of the Port Organics storage building.

### 2.3 Previous Environmental Site Assessments

In April 2009 and August 2010 URS conducted Phase I ESAs of the proposed project site. The Phase I ESAs identified six RECs. Several of these RECs consist of multiple environmental concerns that are located in different locations of the proposed project site. For purposes of clarity, AECOM has subdivided three of these RECs into their own individual RECs. A summary of the revised RECs as identified by URS is provided on the following page.

1. A review of a site-specific environmental database report indicates that five USTs were formerly located at the proposed project site. These USTs include two diesel fuel tanks, an unleaded gasoline tank, a regular gasoline tank, and a premium gasoline tank. At least three of these USTs were removed in 1984. The Phase I ESAs indicated that it is uncertain whether the other two USTs were actually located on the site and whether they may or may not have been removed.
2. A pipe that may be a UST fill or vent pipe was observed south of the large grain bins.
3. Two unknown large concrete covers were observed to the west of the south storage building. The site contact was aware of these structures, but does not know their nature or details on their former use.
4. Port Organics, a former fertilizer manufacturing plant, is located in the northwest portion of the farm operations area (see Figure 2). Manufacturing at this site included the use of hazardous materials and operation of a tank farm and associated concrete sumps. Unknown liquids are currently stored outdoors in drums and containers, and soil staining is present in the former Port Organics manufacturing area.
5. According to URS (as documented in the Phase I ESA) the east sump of the Port Organics facility previously discharged approximately 500 to 750 gallons per day of liquids to the drainage ditch located east of the Port Organics facility through an underground 2-inch flex line in 2009.
6. A farm equipment wash pad abuts the southeast side of the former horse stables building. The concrete, soil, and sediment in the adjacent irrigation ditch were observed to be visually stained.
7. One outdoor uncontained tailings pile, consisting of remnants of fishmeal and bird guano (raw materials used in the fertilizer manufacturing process), was found to the east of the former Port Organics aboveground tank farm. This pile was sampled in 2009 and was characterized as non-Resource Conservation & Recovery Act (RCRA) hazardous waste.
8. One indoor tailings pile, consisting of remnants of fishmeal and bird guano was observed inside the former Port Organics storage building. Like the outdoor tailings pile, this pile was also sampled in 2009 and was characterized as non-RCRA hazardous waste.
9. Stained soils were observed during the site visit in the farming operations area and agricultural production areas. The extent of any subsurface impacts from the staining was unknown.

In addition to addressing the RECs identified by URS, this Phase II ESA evaluated the following additional potential environmental concerns based on AECOM's conversation with Mr. Paul Ackerman on September 22, 2010, and AECOM's experience evaluating similar agricultural sites:

- According to Mr. Ackerman, a Chevron (former Unocal) pipeline runs along the north side of Adohr Road directly across the street from the proposed project site. Mr. Ackerman reported that in the past (exact date unknown) a section of pipeline near the intersection of Adohr and Dairy Roads ruptured, releasing crude oil onto Adohr Road and the immediate surrounding property including the northern edge of the proposed project site. Mr. Ackerman stated that

Unocal quickly repaired the pipeline and removed the impacted soil. This potential environmental concern is referred herein within this report as Area of Concern (AOC)-1.

- According to Mr. Ackerman, a UST was located adjacent to the former airplane hangar that abuts the crop duster air strip. Mr. Ackerman was not aware if the UST was still present on site. This potential environmental concern is referred herein within this report as AOC-2.
- According to Mr. Ackerman, a UST may have been located at the northeast end of the on-site crop duster airstrip, near the former chemical storage pad. Mr. Ackerman was not aware if the UST was still present on site. This potential environmental concern is referred herein within this report as AOC-3.
- It is has been AECOM's experience that residual concentrations of organo-chlorine pesticides (OCPs) are commonly present in the shallow soil of commercial agricultural sites throughout California. This potential environmental concern is referred herein within this report as AOC-4.

## 3.0 Pre-Field Activities

### 3.1 Health and Safety Plan

AECOM prepared a site-specific Health and Safety Plan (HASP) prior to the onset of field activities to address potential physical and chemical hazards associated with the work at the proposed project site and evaluate other health and safety considerations. Additionally, Job Safety Analyses (JSAs) were prepared to mitigate specifically identified hazards encountered within the scope of work. The HASP and JSAs were reviewed and approved by AECOM Health and Safety Management prior to commencement of field activities, and on a daily basis. Site assessment activities conducted by AECOM and subcontractors were performed in accordance and in compliance with the HASP and JSAs.

### 3.2 Permits

According to Kern County Environmental Health Department guidance, permits are not required for installation of soil borings.

### 3.3 Utility Clearance

On September 16, 2010, AECOM contacted Underground Service Alert (USA) of Northern California to notify them of the planned subsurface assessment as required by State law. USA issued ticket numbers 0279029, 0279041, and 0279044 for the planned Phase II ESA of the proposed project site.

### 3.4 Geophysical Survey

On September 23, 2010, AECOM oversaw a geophysical and utility clearance survey conducted by Subsurface Surveys of Carlsbad, California. Subsurface Surveys used ground-penetrating radar and a roller-mounted magnetometer to minimize the likelihood that utilities or other subsurface obstructions were present in the vicinity of the proposed boring locations. In addition, Subsurface Surveys evaluated the five suspect UST areas as well as the two unknown concrete structures.

No subsurface utilities or other subsurface obstructions were identified in the vicinity of the proposed borings. No USTs or other underground anomaly were identified in the vicinity of the presumed UST locations. In addition, no underground structures or potential anomalies were identified in the vicinity of the two unknown concrete structures. The approximate locations of the areas surveyed for suspect USTs and the two unknown concrete structures are illustrated on Figure 3. A copy of the geophysical survey report is included as Appendix A.

## 4.0 Field Assessment Methodology

The field assessment consisted of collection of 70 soil samples from 21 borings, 4 sediment samples, 3 surface soil sample, and 9 soil composite samples for laboratory analyses. The following sections describe the methods that were used to collect the samples.

### 4.1 Soil Borings

From September 21 through 23, 2010, AECOM advanced 21 soil borings (GP-1 through GP-21) at the proposed project site using a truck-mounted, hydraulically operated Geoprobe® sampling system operated by BC2 of Orange, California. The AOC that each boring was designed to evaluate, the targeted sampling depth of each boring, and analytical methodology used to analyze the soil samples is summarized in Table 1. The approximate locations of the borings are illustrated on Figure 4 and Figure 5.

Borings GP-1 through GP-21 were advanced to depths ranging between 4 and 25 feet below ground surface (bgs) depending on the area of concern being evaluated. The soil samples that were planned for volatile organic compound (VOC) analysis were preserved in the field in accordance with U.S. Environmental Protection Agency (EPA) Method 5035. This sample preservation method involves placing approximately 5 grams of soil in laboratory-supplied VOA vials containing sodium bi-sulfate or methanol as preservatives. In addition, soil samples were also placed in unpreserved laboratory-supplied jars for additional laboratory analysis.

The collected soil samples were then sealed, labeled, recorded on a chain-of-custody (COC) form, and placed in an ice chest chilled to approximately 4 degrees Celsius (°C) pending delivery to BC Laboratories, Inc. (BLI) in Bakersfield, California. BLI is a certified hazardous waste testing laboratory under California certification number 1186.

Additional soil from each sample was collected and subsequently screened with a photoionization detector (PID) and observed for visual and olfactory evidence of contamination.

### 4.2 Surface Samples

AECOM used a manually operated hand auger to collect surface samples SS-1, SS-6, and SS-7 from areas of visually stained surface soil located within the former Port Organics tank farm. Each surface soil sample was collected using a stainless steel trowel. The collected surface samples were preserved in accordance with EPA Method 5035 (as described in Section 4.1), placed in laboratory-supplied VOAs and glass jars, sealed, labeled, recorded on a COC form, and placed in an ice chest chilled to approximately 4°C pending delivery to BLI. The approximate locations of the surface samples are illustrated on Figure 4.

### 4.3 Sediment Sampling

AECOM utilized a pole-mounted sampling device to collect sediment samples SS-2 through SS-5 from several irrigation ditches that are located throughout the proposed project site. The collected surface samples were placed in laboratory supplied VOAs and glass jars, sealed, labeled, recorded

on a COC form, and placed in an ice chest chilled to approximately 4°C pending delivery to BLI. The approximate locations of the sediment samples are illustrated on Figures 4 and 5.

#### **4.4 Composite Soil Sampling**

AECOM utilized a stainless steel hand trowel to collect 45 soil samples from nine representative areas (SC-1 through SC-9) located throughout the agricultural fields that comprise the proposed project site. Each square-shaped area measured approximately one acre. Five soil samples (A through E) were collected from each square-shaped area (four samples were collected near the corners and one sample from the middle) and placed in laboratory-supplied glass jars. The collected soil samples were then sealed, labeled, recorded on a COC form, and placed in an ice chest chilled to approximately 4°C pending delivery to BLI for preparing the area composite samples and subsequent analysis. The approximate locations of the composite samples are illustrated on Figure 4.

#### **4.5 Groundwater Sampling**

AECOM planned to advance borings GP-1, GP-3, and GP-7 to a depth of 40 feet bgs in an attempt to collect groundwater hydropunch samples. However, drilling refusal was encountered in borings GP-1 and GP-3 at a depth of approximately 25 feet bgs. The success of advancing boring GP-7 to 40 feet bgs was considered low. Therefore, an attempt to advance boring GP-7 to a depth of 40 feet bgs was not made.

#### **4.6 Sample Location Survey**

With the exception of the soil samples collected from boring GP-14 which was advanced inside a building, each soil sample location was recorded using a Trimble GeoXT sub meter-level Global Positioning System (GPS) unit. Field GPS data was post processed in the office to differentially correct for common satellite and atmospheric errors. The predicted horizontal precision of the post-processed data ranged between 0.4 and 0.7 meters (between 1.3 and 2.3 feet). The sample locations are plotted in Figures 4 and 5.

#### **4.7 Equipment Decontamination**

Equipment that came into contact with, or that was used to collect the soil samples, was cleaned with distilled water and Alconox™ detergent, followed by two rinses of tap and distilled water to prevent cross contamination.

#### **4.8 Boring Abandonment**

Following the completion of the soil sampling activities, the soil borings were backfilled with hydrated bentonite chips and capped with native soil or concrete to match the surrounding surface.

#### **4.9 Laboratory Analyses**

A total of 70 soil samples including 3 surface, 9 composite, and 4 sediment samples were selected for laboratory analysis. Depending on the environmental concern being evaluated the samples were analyzed for one or more of the following parameters:

- VOCs by EPA Method 8260;
- Organophosphorus pesticides (OPPs) by EPA Method 8141;
- OCPs by EPA Method 8081;

- The full carbon range of total petroleum hydrocarbons (TPH) by EPA Method 8015 modified;
- One or more of the Title 22 metals by EPA Method 6010/7000 series;
- pH;
- Phosphorus by EPA Method 365.4;
- Sulfate and Nitrogen by EPA Method 300; and
- Potassium by EPA Method 200.7.

The samples were analyzed on an expedited 48-hour laboratory turnaround-time basis.

## 5.0 Results of Assessment

### 5.1 Site Geology

In general, soils encountered from depths of between 0 and 5 feet bgs during the subsurface assessment consisted primarily of fine-grained material (i.e. clay, silt, sandy silt, and occasional silty sand). Soils encountered from 5 feet bgs to a total depth explored of 25 feet bgs consisted primarily of light gray to reddish brown, fine to medium-grained sand with occasional silt and silt/clay mixtures. Soil from ground surface to 25 feet bgs was primarily dry with the exception of soil borings GP-8 and GP-9 advanced in the former Port Organics concrete-lined sumps, which were moist to wet at a depth of approximately 4 feet bgs. Logs of borings GP-1 through GP-21 are included as Appendix B.

### 5.2 Groundwater

AECOM attempted to advance to borings (GP-1 and GP-3) to a depth of 40 feet bgs to collect a hydropunch groundwater sample. As described in Section 4.5, drilling refusal was encountered at a depth of 25 feet bgs in both borings. In January 2009 URS conducted a geotechnical field exploration of the proposed project site. This drilling program involved the advancement of 13 borings throughout the proposed project site at depths ranging from between 60 and 101.5 feet bgs. Groundwater was not encountered in the 13 borings advanced by URS in January 2009.

### 5.3 Field Observations

An ammonia-like odor was observed in the soil samples collected from the outdoor tailings pile and the concrete-lined sumps located within the former aboveground tank farm. A petroleum hydrocarbon odor and dark stained soil were observed in the soil samples collected from beneath the equipment washing area. With the exception of the soil sample collected from boring GP-8 at a depth of 4 feet bgs (138 parts per million (ppm) by volume), no significant PID readings were measured (above 50 pm) during this assessment.

### 5.4 Geophysical Survey

No subsurface utilities or other subsurface obstructions were identified in the vicinity of the proposed borings. No USTs or other underground anomalies were identified in the vicinity of the presumed UST locations. In addition, no underground structures or anomalies were identified in the vicinity of the two unknown concrete structures.

### 5.5 Analytical Results

The analytical result of the soil and sediment samples collected during the Phase II ESA are summarized in Tables 2 through 5. Table 2 summarizes the analytical results that exceed one or more of the following regulatory guidance values:

- California Human Health Screening Levels (CHHSLs) for industrial properties dated January 2005;
- EPA Region 9 Regional Screening Levels (RSLs) for industrial soil dated May 2010; and



- San Francisco Regional Water Quality Control Board Environmental Screening Levels (ESLs) for commercial/industrial property dated May 2008.

Table 3, 4, and 5 also compares the analytical results against regulatory guidance values, but provides a more comprehensive summary of the results that exceeded a laboratory detection limit. Table 3 provides a summary of the VOC and TPH analytical results; Table 4 provides a summary of the pH, potassium, anion, OPP, and OCP analytical results; and Table 5 presents a summary of metal analytical results. The following sections provide a discussion of the analytical results by the area of concern being evaluated. Copies of the certified laboratory analytical reports and COC documentation are included in Appendix C.

#### **5.5.1 REC 1 – Five Former USTs**

Borings GP-1 through GP-4 were advanced to evaluate the presumed locations of the three former USTs that were removed and the two USTs that may or may not have been removed. VOCs or TPH were not detected above the laboratory detection limit in the 12 soil samples collected from these two areas. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from borings GP-3 and GP-4. With the exception of total arsenic, none of the metals detected exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.2 REC 2 – Vent Pipe/Suspect UST**

Boring GP-6 was advanced adjacent to the suspect vent pipe located to the south of the former grain storage silo. No VOCs, TPH, OCPs, or OPPs were detected in the three soil samples collected from boring GP-6. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-6. With the exception of total arsenic, none of the total metals detected exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.3 REC 3 – Two Large Concrete Covers**

Boring GP-5 was advanced adjacent to the two large concrete covers that were observed to the west of the south farm storage building. No VOCs, TPH, OCPs, or OPPS were detected in the three soil samples collected from boring GP-5. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-5. With the exception of total arsenic, none of the total metals detected exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.4 REC 4 – Port Organics**

Soil samples from borings GP-8, GP-9, GP-10, and GP-19 and surface samples SS-1, SS-5, and SS-6 were collected in the former Port Organics tank farm to evaluate the historical tank farm operations. No OPPs were detected in the 11 soil samples collected from the former tank farm. Low concentrations of VOCs, OCPs, and TPH were detected in one or more of the soil samples collected from the former tank farm. Low to moderate concentrations of potassium, nitrate, sulfate, and phosphate were detected in the soil samples collected from the former tank farm. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from the former tank farm. pH in the soil samples collected ranged from 3.85 (GP-10-5) to 7.87 to (GP-8-4). With the exception of total

arsenic and the OCP endosulfane (detected in the duplicate soil samples), none of the compounds detected in the historical tank farm area exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.5 REC 5 – Port Organics East Sump**

Sediment sample SS-3 was collected adjacent to an underground 2-inch flex line that was observed to be protruding from a drainage ditch located to the east of the Port Organics tank farm. TPH, OCPs, and OPPs were not detected in the sediment sample SS-3. Low to moderate concentrations of VOCs, potassium, nitrate, sulfate, and phosphate were detected in the sediment sample SS-3. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, vanadium, and zinc were detected sediment sample SS-3. With the exception of total arsenic, none of the compounds detected in the former tank farm exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.6 REC 6 – Farm Equipment Wash Pad**

Borings GP-18 and GP-20 and sediment sample SS-2 were collected adjacent to the farm equipment wash pad. Low concentrations of VOCs and low to elevated concentrations of TPH in the mineral oil range were detected in the six soil samples collected from borings GP-18 and GP-20 as well as sediment sample SS-2. In addition, low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, vanadium, and zinc were detected in sediment sample SS-2. However, no OCPs or OPPs were detected in the six soil samples collected from borings GP-18 and GP-20 as well as sediment sample SS-2. With the exception of TPH in the mineral range and total arsenic, none of the compounds detected in the soil and sediment samples collected near the farm equipment wash pad exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.7 REC 7 – Outdoor Tailings Pile**

Borings GP-11, GP-12, and GP-13 were advanced adjacent to the outdoor tailings pile to evaluate the lateral extent of the pile. Low concentrations of VOCs were detected in the seven soil samples collected from borings GP-11, GP-12, and GP-13. No TPH, OCPs, or OPPS were detected in the soil samples collected from borings GP-11, GP-12, and GP-13. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from borings GP-11, GP-12, and GP-13. With the exception of total arsenic, none of the compounds detected exceeded the CHHSLs, RSLs, or ESLs.

#### **5.5.8 REC 8 – Indoor Tailings Pile**

Boring GP-14 was advanced inside the former Port Organics storage building to evaluate if the tailings pile has impacted the underlying subsurface. Low concentrations of VOCs were detected in the two soil samples collected from boring GP-14. No TPH, OCPs, or OPPs were detected in the soil samples collected from boring GP-14. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-14. With the exception of total arsenic, none of the total metals detected exceeded the CHHSLs, RSLs, or ESLs.

### 5.5.9 REC 9 – Stained Surface Soils

Borings GP-15 and GP-16 and sediment sample SS-7 were collected to evaluate visually stained soil that was observed in several areas of the proposed project site. Boring GP-15 was advanced near the northwest end of the crop duster airstrip to evaluate visually stained soil that was observed in this location as well as to evaluate potential pesticides/herbicides releases associated with the crop dusters. Boring GP-16 and sediment sample SS-7 were advanced in the southeast corner of the proposed project site to evaluate an area of stained yellowish soil and to assess if the stained soil had impacted the adjacent irrigation canal.

No VOCs or TPH were detected in the two soil samples collected from boring GP-15. Low concentrations of several OCPs and total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-15. With the exception of total arsenic, none of the compounds detected exceeded the CHHSLs, RSLs, or ESLs.

No VOCs were detected in the soil samples collected from boring GP-16 and sediment sample SS-7. TPH was not detected in the two soil samples collected from boring GP-16; however low concentrations of TPH in the mineral oil range were detected in sediment sample SS-7. Several OCPs were detected in one or more of the soil samples collected from boring GP-16 and sediment sample SS-7. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-16 and sediment sample SS-7. Low to moderate concentrations of potassium, nitrate, sulfate, and phosphate were detected in the sediment sample SS-7. With the exception of total arsenic, none of the compounds detected in boring GP-16 and sediment sample SS-7 exceeded the CHHSLs, RSLs, or ESLs.

### 5.5.10 AOC 1 – Historical Pipeline Release

Boring GP-21 was advanced on the south side of Adohr Road to evaluate a historical petroleum pipeline release as reported by Mr. Ackerman. No VOCs or TPH were detected in the two soil samples collected from boring GP-21. A low concentration of the OCP Dichlorodiphenyltrichloroethane was detected in one of the soil samples collected from boring GP-21. This concentration was well below the CHHSLs, RSLs, and ESLs.

### 5.5.11 AOC 2 – Airport Hangar Soil Staining

Boring GP-17 was advanced adjacent to the former airplane hangar that abuts the crop duster air strip to evaluate stained soil that was present in this location. Low concentrations of VOCs and elevated concentrations of TPH in the mineral oil range were detected in the two soil samples collected from boring GP-17. The OPP tokuthion and the OCPs endrin, Dichlorodiphenyldichloroethane, Dichlorodiphenyldichloroethylene, and Dichlorodiphenyltrichloroethane were detected in one or more of the soil samples collected from boring GP-17. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-17. With the exception of total arsenic, the OCP endrin, and TPH in the mineral oil range, none of the compounds detected exceeded the CHHSLs, RSLs, or ESLs.

### 5.5.12 AOC 3 – Suspect UST, Chemical Storage Pad, and Surface Staining

Boring GP-10 and sediment sample SS-4 were collected at the south end the crop duster airstrip adjacent to the former chemical storage pad. This boring and sediment sample location was selected to evaluate stained soil and the potential presence of a suspect UST as reported by Mr. Ackerman. No VOCs were detected in the three soil samples collected from boring GP-10. However, the VOC benzene was detected in sediment sample SS-4 at a concentration of 0.0021 milligrams per kilogram (mg/kg). TPH and OPPs were not detected in the soil samples collected from boring GP-10 and sediment sample SS-4. Low concentrations of several OCPs were detected in sediment sample SS-4, but no OCPs were detected in the soil samples collected from boring GP-10. Low to moderate concentrations of potassium, nitrate, sulfate, and phosphate were detected in the soil samples collected from boring GP-10 and sediment sample SS-4. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-10 and sediment sample SS-4. With the exception of total arsenic, none of the compounds detected exceeded the CHHSLs, RSLs, and ESLs.

### 5.5.13 AOC 4 – Historical Pesticide and Herbicide Use

OPP were not detected in the composite samples SC-1 through SC-9. However, low concentrations of OCPs were detected in the composite samples SC-1 through SC-9. Of the compounds detected, the concentration of dieldrin in SC-1, SC-5, and SC-9 and the concentrations of endrin in SC-2, SC-5, SC-7, and SC-9 exceeded the ESLs, but not the RSL or CHHSLs. Low concentrations of total arsenic, barium, beryllium, cadmium, cobalt, lead, mercury, nickel, selenium, vanadium, and zinc were detected in one or more of the soil samples collected from boring GP-16 and sediment sample SS-7. With the exception of total arsenic, none of the metals detected exceeded the CHHSLs, RSLs, or ESLs.

## 5.6 Quality Assurance/Quality Control

To demonstrate that quality data has been collected during the field program, field and laboratory quality control samples were analyzed and their data used in support of the primary data. Field quality control samples that were collected for this project consisted of the following:

1. Six field duplicate samples were used to determine relative percent difference (RPD) between duplicates,
2. Sample equipment was decontaminated and equipment blanks were collected to demonstrate its effectiveness, and
3. Trip blank controls were sent with each shipment to evaluate potential cross contamination of VOCs.

Laboratory quality controls included:

1. Method blank samples,
2. Lab control spikes and duplicates, and
3. Matrix spikes and duplicates.

Data for all quality control samples was included with laboratory data packages. Field duplicate RPDs were within criteria for 80 out of 104 analytes for which a valid comparison (measured value in both samples that is greater than 2 times the practical quantitation limit) could be determined. The 24 samples which exceeded criteria are attributed to detections that are close to practical quantitation limits and the variability of the soil at this location. No analytes were detected in trip blank samples. Chloroform was detected in an equipment blank sample, but was not detected in any primary sample. All laboratory quality controls were within laboratory and method-specified criteria.

Overall, based on the analysis of quality control samples collected at the proposed project site, the data are of sufficient quality to be used in the due diligence evaluation of this site.

## 6.0 Conclusions

Based on the results of this Phase II ESA, AECOM provides the following conclusions:

- REC-1 – The geophysical survey did not reveal the presence of USTs in the areas where they had presumably been located based on anecdotal information. This indicates that the USTs have either been removed or were located elsewhere. The analytical results of the soil samples collected from borings GP-1 and GP-2 appear to indicate that the three former USTs have not impacted the proposed project site. In addition, the analytical results of the soil samples collected from borings GP-3 and GP-4 appear to indicate the UST suspected to be present to the west of the horse stable has not impacted the proposed project site.
- REC 2 – A reconnaissance by AECOM of the area around the suspect vent pipe appears to indicate that this suspect vent pipe is more likely a water-related pipe rather than a fuel-related vent pipe. Equipment in the immediate vicinity of the water pipe is labeled as a “vaporizer” and appears to be related to a former propane above ground storage tank that appears to have been located in this area. Based on this information, AECOM concludes that this suspect vent pipe is not related to a potential UST or other environmental concern. However, to be conservative and rule out this potential environmental concern, AECOM advanced boring GP-6 and collected three soil samples from this location for laboratory analysis. The analytical results from these soil samples further demonstrate that REC-2 no longer presents a significant environmental concern to the proposed project site.
- REC 3 –The analytical results of the soil samples collected from borings GP-5 indicate that the soil in the vicinity of the two unknown large concrete covers is not impacted. This information combined with the geophysical survey which did not identify a subsurface anomaly, allow AECOM to conclude that REC-3 no longer presents a significant environmental concern to the proposed project site.
- REC 4 – The analytical results of soil samples collected from the former Port Organics tank farm appears to indicate that soil in this area has not been significantly impacted by the historical fertilizer plant operations. Based on this information, AECOM concludes that REC-4 no longer presents a significant environmental concern to the proposed project site.
- REC 5 – The analytical results of sediment sample SS-4 indicate that the former discharge to the 2-inch flex line that is protruding from a drainage ditch located to the east of the Port Organics tank farm has not significantly impacted the sediment in this location. Based on this information, AECOM concludes that REC-5 no longer presents a significant environmental concern to the proposed project site.
- REC 6 – The analytical results from the soil samples collected from borings GP-18 and GP-20 and sediment sample SS-2 indicate current and historical washing of farm equipment in this location has impacted the shallow soil and sediment with petroleum hydrocarbons at concentrations that exceed the ESLs. The vertical extent of this impact appears to be limited to the upper 5 feet; however the lateral extent of this contamination has not been defined. Based on this information, AECOM concludes that the former farm equipment wash pad continues to present a potentially significant environmental concern to the proposed project site.

- REC 7 – The analytical results from the soil samples collected from borings GP-11 through GP-13 appear to indicate that the potential contaminants associated with the outdoor tailing pile are confined to the immediate area of the pile. No additional lateral characterization of the soil beneath the tailing pile appears to be required.
- REC 8 – The analytical results from the soil samples collected from boring GP-14 appear to indicate that the potential contaminants associated with the indoor tailing pile are largely confined to the immediate area of the pile and have not impacted the shallow soil beneath the concrete floor. No additional characterization of the soil beneath the tailing pile appears to be required.
- REC 9 – The analytical results from the soil samples collected from boring GP-15 and GP-16 and sediment sample SS-7 appear to indicate that the stained soil that is present near the northwest end of the crop duster runway, the potential historical pesticides/herbicides releases (if any) that may have occurred at the end of the airstrip, and the yellow stained soil that is present in the southeast corner of the site do not present a significant environmental concern to the proposed project site.
- AOC 1 – The analytical results from the soil samples collected from boring GP-21 appear to indicate that the historic petroleum pipeline rupture was successfully remediated and has not significantly impacted the proposed project site. Based on this information, AECOM concludes that AOC-1 no longer presents a significant environmental concern to the proposed project site.
- AOC 2 – A UST was not identified during the geophysical survey of the area surrounding the former airplane hangar. However, elevated concentrations of endrin and TPH in the mineral oil range were detected in the 0.5 foot soil samples collected from boring GP-17 at concentrations that exceed regulatory guidance values. The soil in this area was visually stained. Additional lateral and vertical subsurface soil sampling will likely be required to characterize the TPH and endrin impacts in this area.
- AOC 3 – The results of the geophysical survey and analytical results of the soil samples collected from boring GP-10 indicate that the soil in this area has not been significantly impacted by a suspect UST (if any) or former chemical storage. In addition, the analytical results of sediment sample SS-4 collected from the adjacent irrigation channel indicate that the surface staining that is visible in this area has not significantly impacted the nearby sediment. Based on these results, the surface staining in this location appears to be localized and does not appear to present a significant environmental concern to the proposed project site.
- AOC-4 – The OCPs endrin, endosulfan, and dieldrin are present in composite samples SC-1, SC-4, and SC-8 at concentrations that exceed the ESLs, but did not exceed the CHHSL or RSL. These results are consistent with the historical use of the proposed project site as an active agricultural operation. No consistent spatial pattern of OCPs above ESLs was observed and therefore no areas of the proposed project site are anticipated to have any greater risk associated with exposure to these constituents. The low frequency (less than 10 percent) and relatively low concentrations at which these three OCPs were detected in site soils indicate that they do not represent a significant environmental risk and a more rigorous risk analysis is not warranted.

- Total arsenic was detected throughout the proposed project site at concentrations ranging from 1.6 to 35 mg/kg. These concentrations exceed the CHHSLs for arsenic of 0.24 mg/kg, and exceed and/or equal the RSLs of 1.6 mg/kg. However, a mean concentration and variability ( $9.2 \pm 6.9$  mg/kg) was observed throughout the proposed project site which are consistent with regional background arsenic levels (Bradford et al. 1996), rather than the result of historical on-site agricultural operations. It is therefore AECOM's opinion that the concentrations of arsenic detected at the proposed project site are representative of regional background concentrations, and therefore do not present a significant environmental concern to the proposed project site.
- Data collected during this assessment indicate that pesticides in surface soil and sediment are at sufficiently low concentrations that they are unlikely to pose a risk to aquatic biota from surface runoff.
- Groundwater was not encountered during this assessment. In addition, groundwater was not encountered at depths of up to 101 feet bgs by URS in January 2009. The analytical results of soil samples collected in the vicinity of the RECs and AOCs indicate that soil impacts are generally confined to the upper 5 feet. Based on this information, AECOM's concludes that groundwater beneath the proposed project site is unlikely to have been impacted by historical agricultural operations.



## 7.0 Recommendations

Based on the results of this Phase II ESA, AECOM provides the following conclusions:

- No additional assessment is recommended to address RECs 1, 2, 3, 4, 5, 7, 8, and 9 as well as AOCs 1, 3, and 4.
- The lateral and vertical extent of the TPH-impacted soil and sediment associated with REC-6 (farm equipment wash pad) should be defined.
- The lateral and vertical extent of the TPH-impacted soil associated with AOC-2 (airplane hangar) should be defined.
- The indoor and outdoor tailing piles (RECs 7 and 8) should be removed and transported to a permitted disposal facility prior to site redevelopment.
- The stained surface soil that is present in the vicinity of RECs 9 (two areas), REC-10, AOC-2, and AOC-3 should be removed and transported to a permitted facility for disposal prior to site redevelopment.
- The tailing pile removal and impacted soil removal should be conducted under environmental oversight to ensure that these activities are properly documented.

## 8.0 Limitations

This Phase II ESA report has been prepared for the proposed HECA project site located near the intersection of Dairy and Adohr Roads, Kern County, California. In performing our professional services, we have applied present engineering and scientific judgment and used a level of effort consistent with the standard of practice measured on the date the work was performed in the locale of the project site for similar type studies. AECOM makes no warranty, express or implied. AECOM is not responsible for potential inaccuracies in data reported by others.

The analyses and interpretations in this report have been developed solely based on the field observations and the results from laboratory analyses in the soil and material samples collected at the proposed project site. It should be recognized that on any limited subsurface or material assessment, site conditions can vary laterally and with depth below a given site and that potential contaminant sources can go undetected.

## 9.0 References

The following references were consulted in the preparation of this report:

Ackerman, Paul. Personal communication between Paul Ackerman, property owner, and Jim Fickerson, AECOM, on September 22, 2010.

Background Concentrations of Trace and Major Elements in California Soils, Kearney Foundation of Soil Sciences, Division of Agriculture and Natural Resources University of California, Bradford, March 1996.

California Human Health Screening Levels for industrial properties dated January 2005.

EPA Region 9 Regional Screening Levels for industrial soil dated May 2010/; and

Phase I Environmental Site Assessment, HECA Project Site, Kern County, California, April 6, 2009.

Phase I Environmental Site Assessment, HECA Project Site, Kern County, California, August 24, 2010.

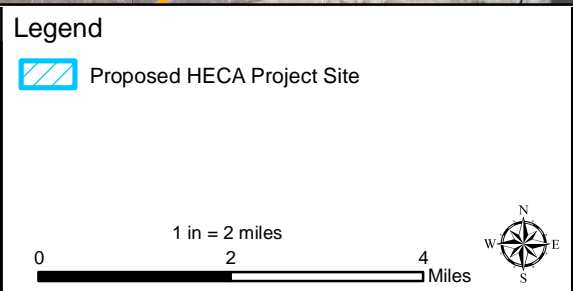
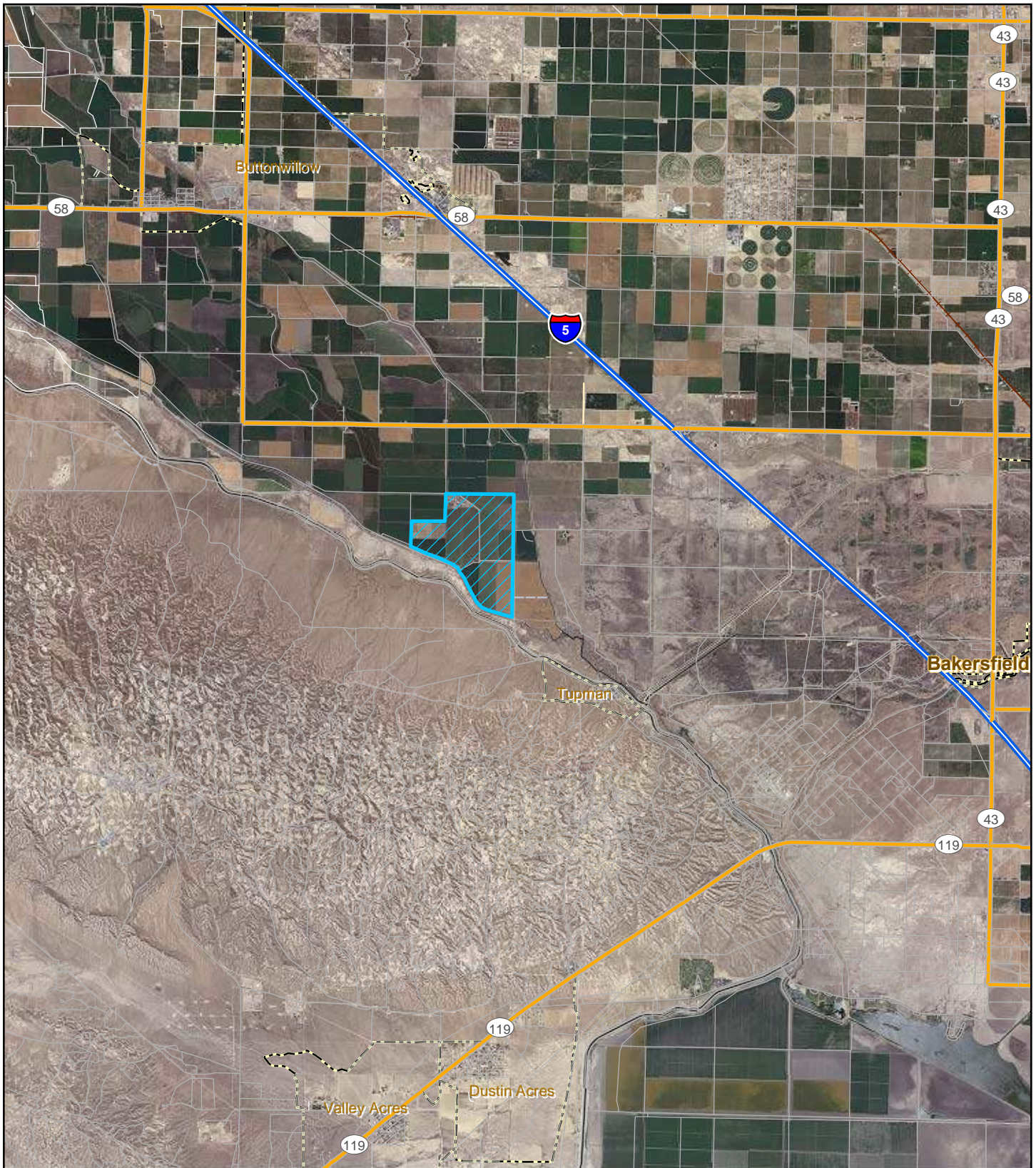
Report Preliminary Geotechnical Investigation Proposed Hydrogen Energy California Project Kern County, California, prepared by URS, dated April 14, 2009.

San Francisco Regional Water Quality Control Board (RWQCB) Environmental Screening Levels for commercial/industrial property dated May 2008.

## Figures

CONFIDENTIAL





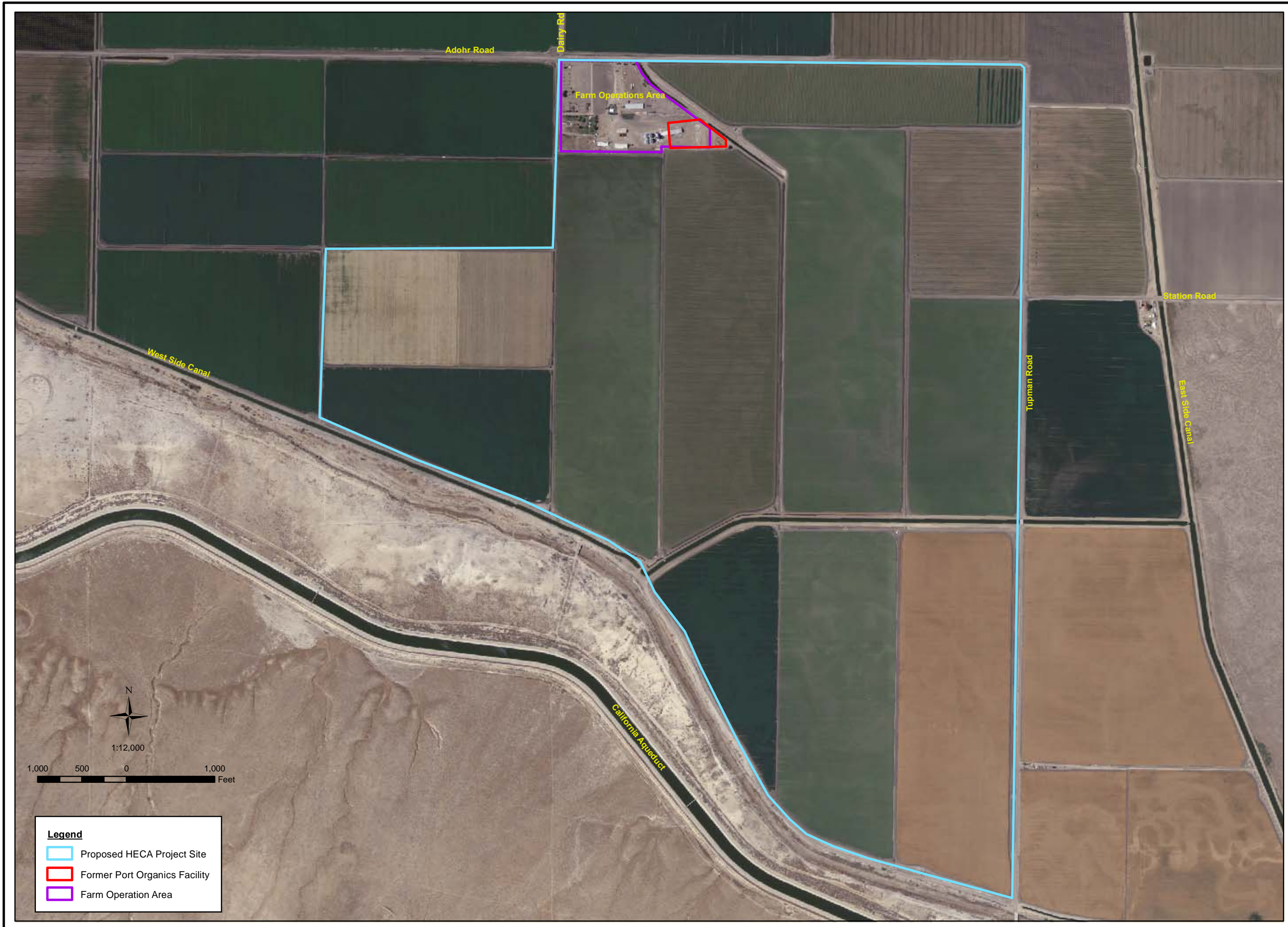
**Hydrogen Energy California**

**Figure 1**  
**Site Location Map**

**AECOM**

Project: 60163371  
Date: October 2010





**Legend**

<span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px;"></span>	Proposed HECA Project Site
<span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span>	Former Port Organics Facility
<span style="border: 1px solid purple; display: inline-block; width: 15px; height: 10px;"></span>	Farm Operation Area

DESIGNED BY:		REVISIONS:	
S. Bilodeau	NO.	DESCRIPTION:	DATE:
DRAWN BY:			
M. Scop			
CHECKED BY:			
J. Fickerson			
APPROVED BY:			
H. Vandenberg			

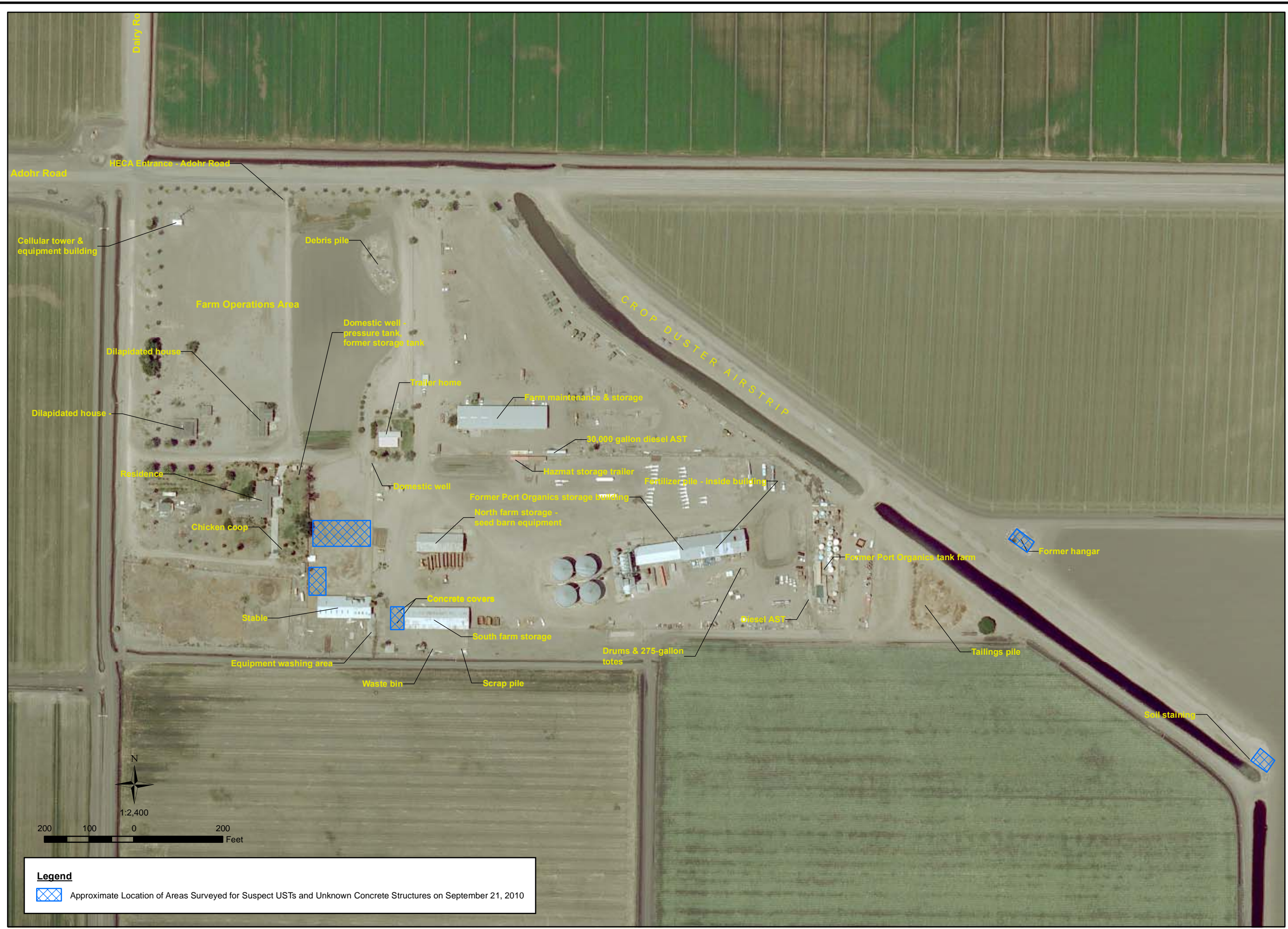
**AECOM**

**AECOM ENVIRONMENT**  
 1220 AVENIDA ACASO  
 CAMARILLO, CALIFORNIA 93012  
 PHONE: (805) 388-3775  
 FAX: (805) 388-3577  
 WEB: HTTP://WWW.AECOM.COM

SITE PLAN			
Hydrogen Energy California Adohr Road and Dairy Road Kern County, California			
SCALE:	X	DATE:	10/1/2010
		PROJECT NUMBER:	60163371

FIGURE NUMBER:	<b>2</b>
SHEET NUMBER:	X





**Legend**  
 [Blue hatched box] Approximate Location of Areas Surveyed for Suspect USTs and Unknown Concrete Structures on September 21, 2010

DESIGNED BY:		REVISIONS:	
S. Bilodeau	NO:	DESCRIPTION:	DATE:
DRAWN BY:			
M. Scop			
CHECKED BY:			
J. Fickerson			
APPROVED BY:			
H. Vandenberg			

**AECOM**

**AECOM ENVIRONMENT**  
 1220 AVENIDA ACASO  
 CAMARILLO, CALIFORNIA 93012  
 PHONE: (805) 388-3775  
 FAX: (805) 388-3577  
 WEB: HTTP://WWW.AECOM.COM

**GEOPHYSICAL SURVEY MAP**

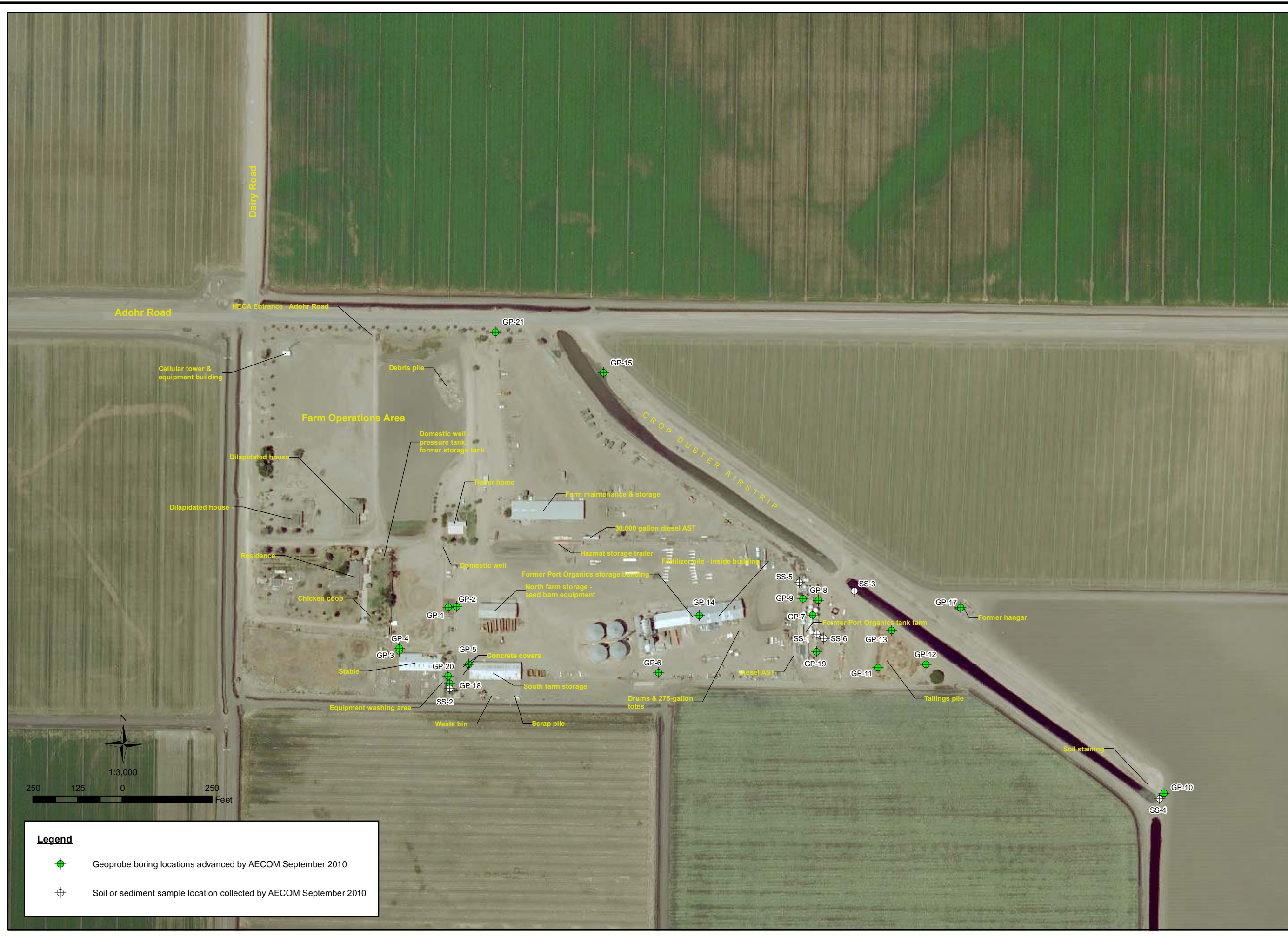
Hydrogen Energy California  
 Adohr Road and Dairy Road  
 Kern County, California

SCALE: X      DATE: 10/1/2010      PROJECT NUMBER: 60163371

FIGURE NUMBER:  
**3**

SHEET NUMBER:  
 X





**Legend**

●	Geoprobe boring locations advanced by AECOM September 2010
⊕	Soil or sediment sample location collected by AECOM September 2010

DESIGNED BY:		REVISIONS:	
S. Bilodeau	NO:	DESCRIPTION:	DATE:
DRAWN BY:			
M. Scop			
CHECKED BY:			
J. Fickerson			
APPROVED BY:			
H. Vandenberg			

**AECOM**

**AECOM ENVIRONMENT**  
 1220 AVENIDA ACASO  
 CAMARILLO, CALIFORNIA 93012  
 PHONE: (805) 388-3775  
 FAX: (805) 388-3577  
 WEB: HTTP://WWW.AECOM.COM

**SAMPLING MAP A**

Hydrogen Energy California  
 Adohr Road and Dairy Road  
 Kern County, California

SCALE:	X	DATE:	10/1/2010	PROJECT NUMBER:	60163371
--------	---	-------	-----------	-----------------	----------

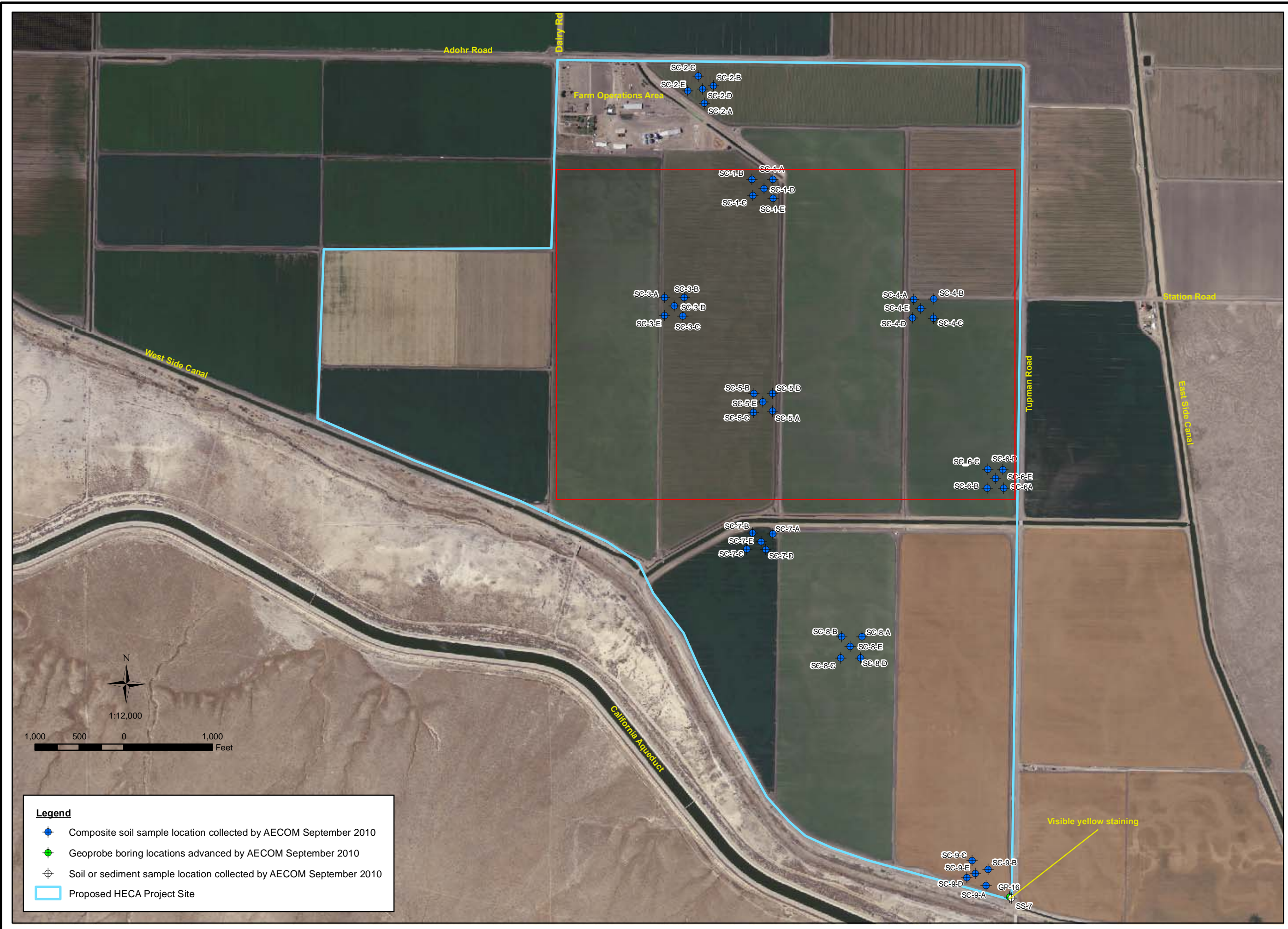
FIGURE NUMBER:

**4**

SHEET NUMBER:

**X**





**Legend**

- ⊕ Composite soil sample location collected by AECOM September 2010
- ⊕ Geoprobe boring locations advanced by AECOM September 2010
- ⊕ Soil or sediment sample location collected by AECOM September 2010
- Proposed HECA Project Site

DESIGNED BY:		REVISIONS:	
S. Bilodeau	NO:	DESCRIPTION:	DATE:
DRAWN BY:			
M. Scop			
CHECKED BY:			
J. Fickerson			
APPROVED BY:			
H. Vandenberg			

**AECOM**

**AECOM ENVIRONMENT**  
 1220 AVENIDA ACASO  
 CAMARILLO, CALIFORNIA 93012  
 PHONE: (805) 388-3775  
 FAX: (805) 388-3577  
 WEB: HTTP://WWW.AECOM.COM

**SAMPLING MAP B**

Hydrogen Energy California  
 Adohr Road and Dairy Road  
 Kern County, California

SCALE:	X	DATE:	10/1/2010	PROJECT NUMBER:	60163371
--------	---	-------	-----------	-----------------	----------

FIGURE NUMBER:

**5**

SHEET NUMBER:

**X**

## Tables

CONFIDENTIAL

**Table 1  
Sampling Plan  
Proposed Hydrogen Energy California Site  
Kern County, California**

REC	Area of Focus	Sample Location	Boring Number	Media	Sample Number	Sample Depth (feet bgs)	Analytical Methodology									
							VOC (8260B)	OPPs 8141	OCPs 8081	TPH-FF (8015M)	Lead (6010)	Title 22 Metals (6010)	pH	Phosphorous (365.4)	Sulfate and Nitrogen (300)	Potassium (200.7)
1	Three former USTs	West of the North Farm Storage Building	GP-1	Soil	GP-1-5	5	NA	Analyze	Analyze	NA	NA	NA	NA	NA	NA	NA
					GP-1-10	10	Analyze	NA	NA	Analyze	Analyze	NA	NA	NA	NA	NA
					GP-1-15	15	Analyze	NA	NA	Analyze	Analyze	NA	NA	NA	NA	NA
1	Three former USTs	West of the North Farm Storage Building	GP-2	Soil	GP-2-5	5	NA	Analyze	Analyze	NA	NA	NA	NA	NA	NA	NA
					GP-2-10	10	Analyze	NA	NA	Analyze	Analyze	NA	NA	NA	NA	NA
					GP-2-15	15	Analyze	NA	NA	Analyze	Analyze	NA	NA	NA	NA	NA
1	Suspect UST	West of the Horse Stable	GP-3	Soil	GP-3-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-3-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-3-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
1	Suspect UST	West of the Horse Stable	GP-4	Soil	GP-4-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-4-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-4-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
3	Suspect underground structure with concrete cover	West of Farm Storage Building	GP-5	Soil	GP-5-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-5-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-5-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
2	Fill Pipe by Grain Bin Suspect UST	South of Grain Storage Bins	GP-6	Soil	GP-6-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-6-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-6-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
4	Port Organics	Tank Farm	GP-7	Soil	GP-7-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					Dup-1	5	Analyze	Analyze	Analyze	Analyze		Analyze	NA	NA	NA	NA
					GP-7-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-7-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
4	Port Organics	Tank Farm	GP-8	Soil	GP-8-4	4	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze	Analyze
4	Port Organics	Tank Farm	GP-9	Soil	GP-9-4	4	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze	Analyze
4	Port Organics stained soil	Tank Farm	Surface	Soil	SS-1	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	Analyze	Analyze	Analyze
					Dup-2	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	Analyze	Analyze	Analyze
3	Farm Equipment Wash Pad	Drainage ditch that abuts the southern portion of the wash pad	Sediment	Sediment	SS-2	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	Analyze	Analyze	Analyze
		Irrigation Ditch located to the Northeast of the Tank Farm			SS-3	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	Analyze	Analyze	Analyze
8	Chemical Storage Area, Suspect UST, and stained surface soil	Southeast end of Airstrip	GP-10	Soil	GP-10-5	5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze	Analyze
					GP-10-10	10	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze	Analyze
					GP-10-15	15	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze	Analyze
8	Stained surface soil near irrigation ditch	Southeast end of Airstrip	NA	Sediment	SS-4	NA	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	Analyze	Analyze	Analyze
7	Outdoor Tailing Pile	East of Tank Farm	GP-11	Soil	GP-11-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					Dup-3	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-11-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
7	Outdoor Tailing Pile	East of Tank Farm	GP-12	Soil	GP-12-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-12-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
7	Outdoor Tailing Pile	East of Tank Farm	GP-13	Soil	GP-13-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-13-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
8	Indoor Tailing Pile	Inside Port Organics Storage Building	GP-14	Soil	GP-14-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-14-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
5	Tank Farm	Tank Farm	Surface	Soil	SS-5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
5	Tank Farm	Tank Farm	Surface	Soil	SS-6	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
9	Stained Surface Soil - Suspect Pesticide Release Area	North end of Airstrip	GP-15	Soil	GP-15-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-15-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
9	Stained Surface Soil	Southeast corner of the proposed project site	GP-16	Soil	GP-16-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-16-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
9	Former Airplane Hanger Stained Surface Soil - Suspect UST	South side of former airplane hanger	GP-17	Soil	GP-17-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-17-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA

**Table 1  
Sampling Plan  
Proposed Hydrogen Energy California Site  
Kern County, California**

REC	Area of Focus	Sample Location	Boring Number	Media	Sample Number	Sample Depth (feet bgs)	Analytical Methodology									
							VOC (8260B)	OPPs 8141	OCPs 8081	TPH-FF (8015M)	Lead (6010)	Title 22 Metals (6010)	pH	Phosphorous (365.4)	Sulfate and Nitrogen (300)	Potassium (200.7)
6	Farm Equipment Wash Area	Southeast Horse Stables	GP-18	Soil	GP-18-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-18-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					Dup-4	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
4	Former Tank Farm	Tank Farm	GP-19	Soil	GP-18-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					Dup-5		Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
6	Farm Equipment Wash Area	Southeast of Horse Stables	GP-20	Soil	GP-18-0.5	0.5	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
					GP-18-2	2	Analyze	Analyze	Analyze	Analyze	NA	Analyze	NA	NA	NA	NA
AOC-1	Historic Pipeline Release	~ 200 feet E of intersection of Adohr and Dairy Rds	GP-21	Soil	GP-21-0.5	0.5	Analyze	NA	NA	Analyze	NA	NA	NA	NA	NA	NA
					GP-21-2	2	Analyze	NA	NA	Analyze	NA	NA	NA	NA	NA	NA
					GP-21-5	5	Analyze	NA	NA	Analyze	NA	NA	NA	NA	NA	NA
9	Stained surface soil	SE corner of the proposed project site.		Sediment	Sediment	SS-7	NA	Analyze	Analyze	Analyze	Analyze	NA	Analyze	Analyze	Analyze	Analyze
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-1A	0.5	NA	NA	Composite A-E & Analyze	NA	NA	Composite A-E & Analyze	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-2A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A & Composite for Arsenic	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	Dup-6	0.5	NA	NA	Composite A-E & Analyze	NA	NA	Composite A-E & Analyze	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-3A	0.5	NA	NA	Composite A-E & Analyze	NA	NA	Composite A-E & Analyze	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-4A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A for Arsenic	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-5A	0.5	NA	NA	Composite A-E & Analyze	NA	NA	Composite A-E & Analyze	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-6A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A for Arsenic	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-7A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A for Arsenic	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-8A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A for Arsenic	NA	NA	NA	NA
AOC-4	Historical Pesticide Applications	Agricultural Fields	NA	Soil composite	SC-9A	0.5	NA	NA	Composite B-E & Analyze	NA	NA	Analyze A for Arsenic	NA	NA	NA	NA

**Notes:**

REC: Recognized environmental condition.

VOCs - Volatile organic compounds.

AOC - Area of concern.

OPPs - Organophosphorus pesticides

NA - Not applicable/not analyzed.

OCPs - Organo-chlorine pesticides.

bgs - Below ground surface.

TPH-FF: The full carbon range of total petroleum hydrocarbons.

**Table 2  
Summary of Analytical Results - Exceedences Only  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	TPH 8015 FF			Organochlorine Pesticides 8081			Metals 6010
				TPH-Diesel	TPH-Motor Oil	TPH-Mineral Oil	Dieldrin	Endo-sulfan II	Endrin	As
GP-3	GP-3-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	5.1
	GP-3-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	4
	GP-3-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	2.9
GP-4	GP-4-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	12
	GP-4-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	2.3
	GP-4-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	5.1
GP-5	GP-5-5	5	9/23/2010	ND	ND	ND	ND	ND	ND	29
	GP-5-10	10	9/23/2010	ND	ND	ND	ND	ND	ND	7
	GP-5-15	15	9/23/2010	ND	ND	ND	ND	ND	ND	1.6
GP-6	GP-6-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	3
	GP-6-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	9.6
	GP-6-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	4.4
GP-7	GP-7-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	8.6
	Dup-1	5	9/22/2010	ND	ND	ND	ND	ND	ND	22
	GP-7-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	13
	GP-7-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	25
GP-8	GP-8-4	4	9/22/2010	ND	ND	22	ND	ND	ND	6.5
GP-9	GP-9-4	4	9/22/2010	ND	ND	68	ND	ND	ND	4.9
GP-10	GP-10-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	4.3
	GP-10-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	15
	GP-10-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	8.2
GP-11	GP-11-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	16
	Dup-3	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	8
	GP-11-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	19
GP-12	GP-12-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	6.7
	GP-12-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	6.4
GP-13	GP-13-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	11
	GP-13-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	6.30
GP-14	GP-14-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	7.3
	GP-14-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	5.4
GP-15	GP-15-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	35
	GP-15-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	21
GP-16	GP-16-0.5	0.5	9/23/2010	ND	ND	ND	0.0014	ND	0.00031	7.7
	GP-16-2	2	9/23/2010	ND	ND	ND	0.00034	ND	ND	7.9
GP-17	GP-17-0.5	0.5	9/22/2010	ND	ND	4300	ND	ND	0.014	27
	GP-17-2	2	9/22/2010	ND	ND	320	ND	ND	0.0070	8.2
	GP-17-5	5	9/22/2010	23	ND	ND	NA	NA	NA	NA
GP-18	GP-18-0.5	0.5	9/23/2010	ND	ND	25000	ND	ND	ND	7.5
	GP-18-2	2	9/23/2010	ND	ND	2000	ND	ND	ND	5.5



**Table 2  
Summary of Analytical Results - Exceedences Only  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	TPH 8015 FF			Organochlorine Pesticides 8081			Metals 6010
				TPH-Diesel	TPH-Motor Oil	TPH-Mineral Oil	Dieldrin	Endo-sulfan II	Endrin	As
	Dup-4	2	9/23/2010	ND	ND	2700	ND	ND	ND	4.9
	GP-18-5	5	9/23/2010	ND	ND	290	ND	ND	ND	4.5
GP-19	GP-19-0.5	0.5	9/21/2010	ND	ND	45	0.0028	ND	0.0019	4.8
	Dup-5		9/21/2010	ND	ND	120	ND	0.0048	0.0032	4.8
	GP-19-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	7.2
GP-20	GP-20-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	16
	GP-20-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	6.7
GP-21	GP-21-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	21
	GP-21-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	19
NA	SS-1	0.5	9/23/2010	ND	ND	140	ND	ND	ND	6.1
NA	Dup-2	0.5	9/23/2010	ND	20000	ND	ND	ND	ND	5.1
NA	SS-2	0.5	9/23/2010	ND	ND	93000	ND	ND	ND	5.5
NA	SS-3	0.5	9/22/2010	ND	ND	ND	ND	ND	ND	5
NA	SS-4	0.5	9/22/2010	ND	ND	ND	0.00071	ND	ND	5.9
NA	SS-5	0.5	9/23/2010	ND	ND	1200	ND	ND	ND	5.4
NA	SS-6	0.5	9/23/2010	ND	ND	26	ND	ND	ND	3.3
NA	SS-7	0.5	9/23/2010	ND	ND	49	ND	ND	ND	5.5
NA	SC-1-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	0.0033	ND	ND	7.9
NA	SC-2A	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	5.4
NA	SC-2-B,C,D,E	0.5	9/21/2010	NA	NA	NA	ND	ND	0.00051	5.6
NA	Dup-6-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	0.00065	ND	0.0015	4.9
NA	SC-3-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	0.00085	ND	ND	8.2
NA	SC-4A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	8.3
NA	SC-5-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	0.0027	ND	0.0014	7.7
NA	SC-6A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	6.5
NA	SC-7A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	14
NA	SC-7-B,C,D,E	0.5	9/22/2010	NA	NA	NA	0.0013	ND	0.0027	NA
NA	SC-8A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	6.4
NA	SC-9A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	7.8
NA	SC-9-B,C,D,E	0.5	9/22/2010	NA	NA	NA	0.0036	ND	0.0022	NA

**Regulatory/Guidance Values**

California Human Health Screening Levels	NS	NS	NS	0.13	NS	230	0.24
US EPA Region 9 Regional Screening Levels	NS	NS	310,000	0.11	26,000	180	1.6
SFBRWQCB ESLs	83	1,000	1,000	0.0023	0.0046	0.00065	5.5

**Notes**

Detected analytes are displayed in **bold**                      NA = Not analyzed/not applicable.                      **Highlight =** Analyte detected in exceedence of screening level  
 ND = Not detected above the laboratory detection limit.      NS = No standard established.

**Table 3  
Summary of Detected Analytes  
VOCs & TPH in Soil  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	VOCs 8260											TPH FF 8015					
				Benzene	sec-Butylbenzene	Ethylbenzene	p-Isopropyltoluene	Methyl t-butyl ether	n-Propylbenzene	Toluene	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Total Xylenes	p- & m-Xylenes	o-Xylene	Diesel	TPH-Motor Oil	TPH-Mineral Oil	
GP-1	GP-1-5	5	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-1-10	10	9/23/2010	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-1-15	15	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-2	GP-2-5	5	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-2-10	10	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95
	GP-2-15	15	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-3	GP-3-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-3-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-3-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-4	GP-4-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-4-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-4-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-5	GP-5-5	5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-5-10	10	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-5-15	15	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-6	GP-6-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-6-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-6-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-7	GP-7-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Dup-1	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-7-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-7-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-8	GP-8-4	4	9/22/2010	0.0019	ND	0.0035	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	51	ND	22	
GP-9	GP-9-4	4	9/22/2010	0.0026	ND	ND	ND	ND	ND	0.0025	ND	ND	ND	ND	ND	ND	50	ND	68	
GP-10	GP-10-5	5	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-10-10	10	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-10-15	15	9/22/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-11	GP-11-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Dup-3	0.5	9/21/2010	0.0013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-11-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-12	GP-12-0.5	0.5	9/21/2010	0.0012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-12-2	2	9/21/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-13	GP-13-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-13-2	2	9/21/2010	0.0015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-14	GP-14-0.5	0.5	9/23/2010	0.0048	ND	ND	ND	ND	ND	0.0027	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND



**Table 3  
Summary of Detected Analytes  
VOCs & TPH in Soil  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	VOCs 8260											TPH FF 8015				
				Benzene	sec-Butyl-benzene	Ethyl-benzene	p-Isopropyl-toluene	Methyl t-butyl ether	n-Propyl-benzene	Toluene	Trichloro-ethene	1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Total Xylenes	p- & m-Xylenes	o-Xylene	Diesel	TPH-Motor Oil	TPH-Mineral Oil
	GP-14-2	2	9/23/2010	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-15	GP-15-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-15-2	2	9/23/2010	0.0027	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-16	GP-16-0.5	0.5	9/23/2010	0.0028	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-16-2	2	9/23/2010	0.0038	ND	ND	ND	ND	ND	0.0018	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-17	GP-17-0.5	0.5	9/22/2010	0.0031	ND	ND	ND	ND	ND	0.0012	ND	ND	ND	ND	ND	ND	ND	ND	4300
	GP-17-2	2	9/22/2010	0.0019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	320
GP-18	GP-18-0.5	0.5	9/23/2010	ND	0.086	0.054	0.13	ND	0.1	0.25	ND	1.2	0.46	0.55	0.3	0.25	ND	ND	25000
	GP-18-2	2	9/23/2010	ND	0.033	0.039	0.058	ND	0.043	0.058	ND	0.36	0.15	0.18	0.083	0.093	ND	ND	2000
	Dup-4	2	9/23/2010	ND	0.056	0.04	0.092	ND	0.069	0.066	ND	0.72	0.25	0.24	0.12	0.13	ND	ND	2700
	GP-18-5	5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	290
GP-19	GP-19-0.5	0.5	9/21/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	45
	Dup-5	2	9/21/2010	0.0031	ND	ND	ND	ND	ND	0.0011	ND	ND	ND	ND	ND	ND	ND	ND	120
	GP-19-2	2	9/21/2010	0.0034	ND	ND	ND	ND	ND	0.0014	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-20	GP-20-0.5	0.5	9/23/2010	0.0019	ND	ND	ND	0.00053	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-20-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-21	GP-21-0.5	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-21-2	2	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SS-1	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140
NA	Dup-2	0.5	9/23/2010	0.0014	ND	0.0018	0.017	ND	ND	0.046	ND	0.013	0.0054	0.0088	0.0057	0.0031	ND	20000	ND
NA	SS-2	0.5	9/23/2010	0.0018	ND	0.0018	0.025	ND	ND	0.048	0.0019	0.021	0.0077	0.015	0.01	0.0047	ND	ND	93000
NA	SS-3	0.5	9/22/2010	ND	ND	0.0020	0.0060	ND	ND	0.0061	ND	0.0014	ND	ND	ND	0.0014	ND	ND	ND
NA	SS-4	0.5	9/22/2010	0.0021	ND	ND	ND	ND	ND	0.0027	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SS-5	0.5	9/23/2010	0.0017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200
NA	SS-6	0.5	9/23/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26
NA	SS-7	0.5	9/23/2010	0.0021	ND	ND	ND	ND	ND	0.0013	ND	ND	ND	ND	ND	ND	ND	ND	49
NA	SC-1-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-2A	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-2-B,C,D,E	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	Dup-6-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-3-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-4A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-4-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-5-A,B,C,D,E	0.5	9/21/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-6A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Table 3  
Summary of Detected Analytes  
VOCs & TPH in Soil  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	VOCs 8260												TPH FF 8015				
				Benzene	sec-Butylbenzene	Ethylbenzene	p-Isopropyltoluene	Methyl t-butyl ether	n-Propylbenzene	Toluene	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Total Xylenes	p- & m-Xylenes	o-Xylene	Diesel	TPH-Motor Oil	TPH-Mineral Oil	
NA	SC-6-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-7A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-7-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-8A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-8-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-9A	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NA	SC-9-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
				Regulatory/Guidance Values																
California Human Health Screening Levels				NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
US EPA Region 9 Regional Screening Levels				5.4	NS	27	NS	220	21,000	4,500	14	260	10,000	2,700	17,000	17,000	NS	NS	310,000	
SFBRWQCB ESLs				0.044	NS	3.3	NS	0.023	NS	2.9	0.46	NS	NS	2.3	NS	NS	100	1,000	1,000	
<b>Notes</b>																				
Detected analytes are displayed in <b>bold</b>																				
ND = Not detected above the laboratory detection limit.																				
NA = Not analyzed.																				
NM - Not measured.																				
NS = No standard established.																				
<b>Highlight =</b> Analyte detected in exceedence of screening level.																				

**Table 4  
Summary of Detected Analytes  
pH, Potassium, Anions, OPPs, and OCPs in Soil  
Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	pH	Potassium	Anions			OPPs 8141				OCPs 8081										
						Nitrate	Sulfate	Phosphate	Tokuthion	Chlorpyrifos	Beta BHC	Delta BHC	Gamma BHC (Lindane)	Dieldrin	Endo-sulfan I	Endo-sulfan II	Endrin	4,4'-DDD	4,4'-DDE	4,4'-DDT	Methoxychlor	Heptachlor	
GP-1	GP-1-5	5	9/23/2010	NM	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-1-10	10	9/23/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-1-15	15	9/23/2010	NM	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-2	GP-2-5	5	9/23/2010	NM	NA	NA	NA	NA	NA	NA	ND	<b>0.00035</b>	ND	ND	ND	ND	<b>0.00055</b>	<b>0.001</b>	<b>0.0039</b>	<b>0.005</b>	ND	ND	ND
	GP-2-10	10	9/23/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-2-15	15	9/23/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-3	GP-3-5	5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-3-10	10	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<b>0.0039</b>	ND	ND
	GP-3-15	15	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-4	GP-4-5	5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-4-10	10	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-4-15	15	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-5	GP-5-5	5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-5-10	10	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-5-15	15	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-6	GP-6-5	5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-6-10	10	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-6-15	15	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-7	GP-7-5	5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Dup-1	5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-7-10	10	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-7-15	15	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-8	GP-8-4	4	9/22/2010	<b>7.87</b>	<b>6600</b>	<b>210</b>	<b>9100</b>	<b>7000</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GP-9	GP-9-4	4	9/22/2010	<b>6.33</b>	<b>6300</b>	<b>4</b>	<b>32000</b>	<b>6800</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<b>0.037</b>	ND	ND	ND	
GP-10	GP-10-5	5	9/22/2010	<b>3.85</b>	<b>2300</b>	<b>99</b>	<b>210</b>	<b>290</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-10-10	10	9/22/2010	<b>6.34</b>	<b>1600</b>	<b>2</b>	<b>71</b>	<b>200</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-10-15	15	9/22/2010	<b>6.83</b>	<b>630</b>	<b>0.59</b>	<b>37</b>	<b>150</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-11	GP-11-0.5	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<b>0.0029</b>	ND	ND
	Dup-3	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	<b>0.00034</b>	ND	<b>0.0005</b>	ND	ND	ND	ND	ND	ND	ND	ND
	GP-11-2	2	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	<b>0.00055</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-12	GP-12-0.5	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	<b>0.014</b>	ND	ND	ND	ND	ND	ND	ND	<b>0.14</b>	<b>0.023</b>	ND	ND
	GP-12-2	2	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	<b>0.068</b>	ND	ND	ND	ND	ND	ND	<b>0.016</b>	ND	ND	ND	ND
GP-13	GP-13-0.5	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-13-2	2	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	<b>0.00062</b>	ND	ND	ND	ND	ND	ND	<b>0.00062</b>	<b>0.0016</b>	<b>0.00049</b>	ND	ND
GP-14	GP-14-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-14-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

**Table 4**  
**Summary of Detected Analytes**  
**pH, Potassium, Anions, OPPs, and OCPs in Soil**  
**Hydrogen Energy California Site**  
**Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	pH	Potassium	Anions			OPPs 8141				OCPs 8081										
						Nitrate	Sulfate	Phosphate	Tokuthion	Chlorpyrifos	Beta BHC	Delta BHC	Gamma BHC (Lindane)	Dieldrin	Endo-sulfan I	Endo-sulfan II	Endrin	4,4'-DDD	4,4'-DDE	4,4'-DDT	Methoxychlor	Heptachlor	
GP-15	GP-15-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	0.00033	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-15-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-16	GP-16-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.00069	ND	0.0014	ND	ND	0.00031	0.001	0.016	0.00096	ND	ND	ND
	GP-16-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	0.00034	ND	ND	ND	ND	0.0044	ND	ND	ND	ND
GP-17	GP-17-0.5	0.5	9/22/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	0.014	0.014	0.046	0.038	ND	ND	ND
	GP-17-2	2	9/22/2010	NM	NA	NA	NA	NA	0.064	ND	ND	ND	ND	ND	ND	ND	0.0070	0.0092	0.0270	0.0360	ND	ND	ND
GP-18	GP-18-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.014	ND	ND	ND	ND	ND
	GP-18-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.0019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Dup-4	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-18-5	5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.00022	ND	ND	ND	ND	ND	ND	0.00065	ND	ND	ND	ND
GP-19	GP-19-0.5	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	0.00091	0.0093	0.00099	0.0028	ND	ND	0.0019	0.0057	0.07	0.0081	ND	0.0003	ND
	Dup-5		9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.016	ND	ND	ND	0.0048	0.0032	0.0093	0.16	0.013	ND	ND	ND
	GP-19-2	2	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-20	GP-20-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	GP-20-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-21	GP-21-0.5	0.5	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND
	GP-21-2	2	9/23/2010	NM	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SS-1	0.5	9/23/2010	NM	8500	3600	26000	9200	ND	ND	ND	0.0078	ND	ND	ND	ND	ND	0.0062	0.02	0.0011	ND	ND	ND
NA	Dup-2	0.5	9/23/2010	NM	3400	0.41	96	1400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SS-2	0.5	9/23/2010	NM	3500	0.44	140	1600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SS-3	0.5	9/22/2010	NM	1600	0.4	390	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0019	0.0030	ND	ND	ND	ND
NA	SS-4	0.5	9/22/2010	NM	2200	0.38	200	800	ND	ND	ND	ND	ND	0.00071	ND	ND	ND	0.0071	0.0077	0.0027	ND	ND	ND
NA	SS-5	0.5	9/23/2010	NM	3200	4500	6200	4600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0083	ND	ND	ND
NA	SS-6	0.5	9/23/2010	NM	3000	5400	9700	2300	ND	ND	ND	0.002	ND	ND	ND	ND	ND	0.00082	ND	ND	ND	ND	ND
NA	SS-7	0.5	9/23/2010	NM	3000	0.79	210	510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	SC-1-A,B,C,D,E	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.0039	ND	0.0033	ND	ND	ND	0.0026	0.039	0.011	ND	ND	ND
NA	SC-2A	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-2-B,C,D,E	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.0054	ND	ND	ND	ND	0.00051	0.00083	0.022	0.0046	ND	ND	ND
NA	Dup-6-A,B,C,D,E	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	0.0037	ND	0.0056	ND	0.00065	ND	ND	0.0015	0.0015	0.028	0.0061	ND	ND	ND
NA	SC-3-A,B,C,D,E	0.5	9/21/2010	NM	NA	NA	NA	NA	ND	ND	ND	0.0026	ND	0.00085	ND	ND	ND	ND	0.0086	0.00098	ND	ND	ND
NA	SC-4A	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-4-B,C,D,E	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	ND	0.0045	ND	ND	ND	ND	0.00055	ND	0.017	0.0025	ND	ND	ND
NA	SC-5-A,B,C,D,E	0.5	9/21/2010	NM	NA	NA	NA	NA	NA	NA	ND	0.004	ND	0.0027	ND	ND	0.0014	0.0017	0.024	0.0078	ND	ND	ND
NA	SC-6A	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-6-B,C,D,E	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	ND	0.0029	ND	ND	ND	ND	ND	ND	0.0088	0.0016	ND	ND	ND
NA	SC-7A	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-7-B,C,D,E	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	ND	0.0048	ND	0.0013	ND	ND	0.0027	0.002	0.05	0.012	ND	ND	ND

**Table 4**  
**Summary of Detected Analytes**  
**pH, Potassium, Anions, OPPs, and OCPs in Soil**  
**Hydrogen Energy California Site**  
**Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	pH	Potassium	Anions			OPPs 8141		OCPs 8081												
						Nitrate	Sulfate	Phosphate	Tokuthion	Chlorpyrifos	Beta BHC	Delta BHC	Gamma BHC (Lindane)	Dieldrin	Endo-sulfan I	Endo-sulfan II	Endrin	4,4'-DDD	4,4'-DDE	4,4'-DDT	Meth-oxychlor	Hepta-chlor	
NA	SC-8A	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-8-B,C,D,E	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	ND	<b>0.0037</b>	ND	ND	ND	ND	ND	ND	<b>0.01</b>	<b>0.0014</b>	ND	ND	
NA	SC-9A	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-9-B,C,D,E	0.5	9/22/2010	NM	NA	NA	NA	NA	NA	NA	ND	<b>0.0049</b>	ND	<b>0.0036</b>	ND	ND	<b>0.0022</b>	<b>0.001</b>	<b>0.044</b>	<b>0.0071</b>	ND	ND	
Regulatory/Guidance Values																							
California Human Health Screening Levels				NS	NS	NS	NS	NS	NS	NS	NS	NS	2	0.13	NS	NS	230	9	6.3	6.3	3800	0.52	
US EPA Region 9 Regional Screening Levels				NS	NS	1,600,000	NS	NS	NS	1,800	NS	NS	NS	0.11	26000	26000	180	7.2	5.1	7	3100	0.38	
SFBRWQCB ESLs				NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0023	0.0046	0.0046	0.00065	9	4	4	19	0.014		

**Notes**

Detected analytes are displayed in **bold**  
 ND = Not detected above the laboratory detection limit.  
 NA = Not analyzed.  
 NM = Not measured.  
 NS = No standard established.  
**Highlight =** Analyte detected in exceedence of screening level.

**Table 5  
Summary of Detected Analytes  
Metals in Soil  
Proposed Hydrogen Energy California Site  
Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	Metals 6010																
				Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Th	V	Zn
GP-1	GP-1-5	5	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-1-10	10	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	0.88	NA	NA	NA	NA	NA	NA	NA	NA
	GP-1-15	15	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	0.69	NA	NA	NA	NA	NA	NA	NA	NA
GP-2	GP-2-5	5	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-2-10	10	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	2.9	NA	NA	NA	NA	NA	NA	NA	NA
	GP-2-15	15	9/23/2010	NA	NA	NA	NA	NA	NA	NA	NA	1.3	NA	NA	NA	NA	NA	NA	NA	NA
GP-3	GP-3-5	5	9/22/2010	ND	5.1	170	0.56	0.097	12	6.7	16	15	ND	1.2	10	ND	0.13	ND	42	45
	GP-3-10	10	9/22/2010	ND	4	79	0.57	0.094	12	6.1	12	3.8	ND	2.2	7.1	ND	ND	ND	49	46
	GP-3-15	15	9/22/2010	ND	2.9	33	0.3	ND	4.3	2.3	2.9	0.77	ND	1	1.8	ND	ND	ND	45	23
GP-4	GP-4-5	5	9/22/2010	ND	12	120	0.64	0.098	35	7.8	21	32	0.014	5.2	16	0.85	ND	ND	49	51
	GP-4-10	10	9/22/2010	ND	2.3	48	0.22	ND	5.4	3.4	5.3	1.8	ND	1.1	3	ND	ND	ND	26	35
	GP-4-15	15	9/22/2010	ND	5.1	28	0.29	ND	4.8	1.9	2.8	1.1	ND	1.7	1.5	ND	ND	ND	35	21
GP-5	GP-5-5	5	9/23/2010	ND	29	140	0.58	ND	11	6.6	10	3.1	0.021	3	7.7	ND	ND	ND	45	41
	GP-5-10	10	9/23/2010	ND	7	140	0.55	0.077	13	5.8	13	4.2	0.013	0.87	9.3	0.55	ND	ND	40	43
	GP-5-15	15	9/23/2010	ND	1.6	21	0.19	ND	4.5	2	2.8	1.3	ND	0.32	1.6	ND	ND	ND	22	17
GP-6	GP-6-5	5	9/22/2010	ND	3	89	0.74	0.13	19	6.6	15	5.3	ND	3.5	12	ND	ND	ND	40	62
	GP-6-10	10	9/22/2010	ND	9.6	270	0.38	0.05	8.3	5.1	8.7	2.5	0.012	3.1	4.7	0.71	ND	ND	30	35
	GP-6-15	15	9/22/2010	0.85	4.4	57	0.15	0.051	4.8	2.7	3.4	1	ND	1.2	2.6	0.71	ND	ND	15	24
GP-7	GP-7-5	5	9/22/2010	ND	8.6	150	1	0.47	23	7.6	25	7.4	0.02	1.4	18	ND	0.1	ND	76	67
	Dup-1	5	9/22/2010	ND	22	100	0.52	0.31	10	5.3	12	3.2	ND	1.6	7.2	ND	0.16	ND	50	49
	GP-7-10	10	9/22/2010	ND	13	120	0.67	0.11	15	7.2	16	4	ND	0.86	9.5	ND	ND	ND	47	59
	GP-7-15	15	9/22/2010	ND	25	230	0.64	0.14	16	7.8	15	5	0.012	2.9	9.1	0.55	ND	ND	40	51
GP-8	GP-8-4	4	9/22/2010	ND	6.5	100	0.55	2.6	24	4.8	27	7.9	0.013	2.5	15	ND	ND	ND	50	250
GP-9	GP-9-4	4	9/22/2010	ND	4.9	58	0.38	3	49	2.9	22	5.3	0.032	3.6	21	0.58	0.17	ND	45	150
GP-10	GP-10-5	5	9/22/2010	ND	4.3	110	0.44	0.16	12	5.5	11	3.1	ND	4.1	7.8	0.57	ND	ND	33	44
	GP-10-10	10	9/22/2010	ND	15	53	0.19	0.092	7.1	3.1	5.5	1.4	0.016	16	4.6	ND	ND	ND	18	28
	GP-10-15	15	9/22/2010	ND	8.2	25	0.06	ND	2.4	0.84	2.1	0.75	ND	4.6	1.3	ND	ND	ND	7.7	9.1
GP-11	GP-11-0.5	0.5	9/21/2010	ND	16	130	0.75	0.69	19	6	26	14	0.064	13	14	1.1	ND	ND	54	97
	Dup-3	0.5	9/21/2010	ND	8	140	0.66	1.1	18	5.9	32	26	0.058	2.5	13	0.65	ND	ND	44	330
	GP-11-2	2	9/21/2010	ND	19	140	0.83	0.38	18	6	22	6.5	0.094	31	16	ND	ND	ND	65	59
GP-12	GP-12-0.5	0.5	9/21/2010	ND	6.7	140	0.64	1.5	18	5.6	39	23	0.056	2.5	14	0.53	ND	ND	45	480
	GP-12-2	2	9/21/2010	ND	6.4	130	0.62	0.25	15	5.2	13	4.8	0.037	2.5	10	0.72	ND	ND	38	65
GP-13	GP-13-0.5	0.5	9/21/2010	0.82	11	150	0.77	0.57	18	6.4	20	7.6	0.031	11	17	0.79	ND	ND	49	61
	GP-13-2	2	9/21/2010	ND	6.30	150	0.77	0.42	18	6.8	19	6.60	0.02	6.10	16	1.30	ND	ND	42	62
GP-14	GP-14-0.5	0.5	9/23/2010	ND	7.3	170	0.92	0.33	19	7.5	20	8.1	0.03	4.4	14	ND	ND	ND	47	67
	GP-14-2	2	9/23/2010	ND	5.4	210	0.99	0.39	23	8.7	25	8.7	0.028	2	18	0.69	ND	0.73	60	73
GP-15	GP-15-0.5	0.5	9/23/2010	ND	35	190	0.92	0.25	22	8	26	11	0.28	9.8	13	ND	ND	ND	71	78
	GP-15-2	2	9/23/2010	ND	21	69	0.45	0.19	14	3.9	14	3.6	0.028	18	8	ND	ND	ND	44	46
GP-16	GP-16-0.5	0.5	9/23/2010	ND	7.7	150	0.77	0.55	21	7.2	19	9.1	0.032	1.5	18	ND	ND	ND	45	76
	GP-16-2	2	9/23/2010	ND	7.9	140	0.88	0.55	25	7.9	22	10	0.037	1.6	21	0.86	ND	ND	50	71
GP-17	GP-17-0.5	0.5	9/22/2010	ND	27	140	0.72	1.10	18	6.3	26	27	0.038	3.7	14.0	0.7	ND	ND	50	160
	GP-17-2	2	9/22/2010	ND	8.2	140	0.74	0.29	16	6.5	20	7.1	ND	2.7	14	0.64	ND	ND	51	67
GP-18	GP-18-0.5	0.5	9/23/2010	1.30	7.5	120	0.4	1.3	18	5.3	63	17	0.028	12	15	ND	0.079	ND	36	290
	GP-18-2	2	9/23/2010	ND	5.5	110	0.51	0.63	21	5.3	27	12	0.018	1.7	12	ND	ND	ND	34	110
	Dup-4	2	9/23/2010	ND	4.9	150	0.53	0.64	14	5.1	20	13	0.021	1.3	9.9	ND	ND	ND	35	110
	GP-18-5	5	9/23/2010	ND	4.5	150	0.62	0.14	14	6.5	16	4.5	0.022	0.91	12	ND	0.073	ND	42	50
GP-19	GP-19-0.5	0.5	9/21/2010	ND	4.8	95	0.52	1.7	19	4.5	33	8.9	0.039	2.1	13	0.6	ND	ND	41	180
	Dup-5		9/21/2010	ND	4.8	120	0.58	0.58	17	5.5	26	12	0.048	2.2	14	ND	ND	ND	39	140
	GP-19-2	2	9/21/2010	ND	7.2	160	0.91	0.39	19	7.5	24	7.9	0.031	1.5	15	ND	ND	ND	60	77
GP-20	GP-20-0.5	0.5	9/23/2010	ND	16	190	1.1	0.28	23	8.3	25	10	0.022	1.7	18	1	ND	ND	66	70
	GP-20-2	2	9/23/2010	ND	6.7	150	0.94	0.18	22	8	16	6.9	0.023	1.4	15	ND	ND	ND	49	56
GP-21	GP-21-0.5	0.5	9/23/2010	ND	21	160	0.82	0.4	20	7.1	20	9.6	0.056	5.7	15	ND	ND	ND	58	78

**Table 5**  
**Summary of Detected Analytes**  
**Metals in Soil**  
**Proposed Hydrogen Energy California Site**  
**Kern County, California**

Boring Number	Sample Number	Sample Depth (feet bgs)	Sample Date	Metals 6010																
				Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Th	V	Zn
	GP-21-2	2	9/23/2010	ND	19	140	0.71	0.42	20	6.2	20	15	0.059	11	14	ND	ND	ND	60	66
NA	SS-1	0.5	9/23/2010	ND	6.1	63	0.55	7.4	31	3.2	46	9	0.027	2.7	19	ND	ND	ND	56	230
NA	Dup-2	0.5	9/23/2010	1.90	5.1	150	0.45	1.6	17	4.6	51	17	0.049	14	13	ND	ND	ND	33	290
NA	SS-2	0.5	9/23/2010	1.60	5.5	140	0.45	1.7	17	4.9	63	22	0.053	12	14	ND	ND	ND	33	290
NA	SS-3	0.5	9/22/2010	ND	5	120	0.54	9.3	39	3.7	76	5.8	0.018	4.2	21	ND	ND	ND	60	310
NA	SS-4	0.5	9/22/2010	ND	5.9	87	0.5	4.5	22	3.4	37	4.7	0.024	3.2	8.5	ND	ND	ND	43	200
NA	SS-5	0.5	9/23/2010	ND	5.4	76	0.41	1.1	19	3.8	17	5.5	0.024	1.9	13	ND	ND	ND	34	83
NA	SS-6	0.5	9/23/2010	ND	3.3	44	0.27	0.96	11	2.5	8.6	3.6	0.012	1.1	11	ND	ND	ND	22	84
NA	SS-7	0.5	9/23/2010	ND	5.5	86	0.5	0.35	15	4.9	14	5.1	0.019	0.88	13	ND	0.05	ND	30	62
NA	SC-1-A,B,C,D,E	0.5	9/21/2010	NA	7.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-2A	0.5	9/21/2010	NA	5.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-2-B,C,D,E	0.5	9/21/2010	NA	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	Dup-6-A,B,C,D,E	0.5	9/21/2010	NA	4.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-3-A,B,C,D,E	0.5	9/21/2010	NA	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-4A	0.5	9/22/2010	NA	8.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-4-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-5-A,B,C,D,E	0.5	9/21/2010	NA	7.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-6A	0.5	9/22/2010	NA	6.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-6-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-7A	0.5	9/22/2010	NA	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-7-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-8A	0.5	9/22/2010	NA	6.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-8-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-9A	0.5	9/22/2010	NA	7.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	SC-9-B,C,D,E	0.5	9/22/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Regulatory/Guidance Values**

California Human Health Screening Levels	380	0.24	63,000	1,700	7.5	100,000	3,200	38,000	3,500	180	4,800	16,000	4,800	4,800	63	6,700	10,000
US EPA Region 9 Regional Screening Levels	410	1.6	190,000	2,000	800	1,500,000	300	41,000	800	34	5,100	20,000	390	5,100	NS	5,200	310,000
SFBRWQCB ESLs	40	1.6	1,500	8	7.4	58	10	230	750	10	40	150	10	40	16	200	600

**Notes**

Detected analytes are displayed in **bold**  
 ND = Not detected above the laboratory detection limit.  
 NA = Not analyzed.  
 NM = Not measured.  
 NS = No standard established.  
 Highlight = Analyte detected in exceedence of screen level.



## Section E. Mitigation Measures

---

In order to reduce potential impacts to a less than significant level, the following mitigation measures will be implemented:

### **Air Quality**

AQ - 1: The BVWSD will develop a Dust Control Plan as prescribed and approved by the San Joaquin Valley Air Pollution Control Board to minimize and control fugitive dust during construction.

### **Biological**

BIO 1 - An Environmental Awareness Program will be presented to all personnel working in the field on the proposed project site. The program will consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection explain endangered species concerns. The program will include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under the Endangered Species Act(s), and measures being incorporated for the protection of these species and their habitats will also be addressed.

BIO 2 - As close to the beginning of project activities as possible, but not more than 14 days prior, a qualified biologist will conduct a final pre-construction biological survey of proposed construction areas to verify that no special-status species have become established in the project site.

BIO 3 - Project site boundaries will be clearly delineated by stakes and/or flagging. Project activities are restricted to the project site to minimize inadvertent degradation or loss of adjacent habitat or agricultural lands during project operations.

BIO 4 - All areas of habitat and small mammal burrows that may serve as potential for special-status species will be avoided during project activities.

BIO 5 - To prevent entry of special-status small mammals and other wildlife into construction areas, an exclusion barrier (i.e., silt fencing) should be installed along the southern edge of the project boundary.

BIO 6 - A biological monitor is recommended when project activities are being conducted in areas adjacent to potential habitat for special-status species (on the south end of the project site). The biologist will be available to direct exclusion barrier installation, and on an on-call basis thereafter for the duration of the project, to direct project activities and ensure that take of listed and other special-status species is avoided.

BIO 7 - Off-road traffic outside of the designated project site should be prohibited.

BIO 8 - Project-related traffic will observe a 20 mph speed limit in the project site, except on County roads and State and federal highways, to avoid impacts to special-status and common wildlife species.

BIO 9 - When possible, project activities will be scheduled to avoid evening hours to minimize potential impacts to special-status wildlife species that are active during the night.

BIO 10 - Hazardous materials, fuels, lubricants, and solvents that spill accidentally during project-related activities will be cleaned up and removed from the project sites as soon as possible according to applicable federal, State and local regulations.

BIO 11 - To prevent entrapment of animals during construction, all excavated steep-walled holes or trenches in excess of two (2) feet in depth should be covered at the close of each working day by plywood or similar material. For trenches that cannot be closed daily, one or more escape ramps constructed of earth fill or wooden planks should be installed. Ramps should be located at no greater than 1,000-foot intervals (for pipelines) and at no less than 45-degree angles.

BIO 12 - Before such holes or trenches are filled they should be thoroughly inspected for trapped animals. Any animals discovered will be allowed to escape voluntarily, or will be removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

BIO 13 - All pipes, culverts, or similar structures stored at the proposed project sites overnight having a diameter of four (4) inches or greater will be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight will be capped. If during project implementation a wildlife species is discovered inside a pipe, that section of pipe will not be moved or, if necessary, moved only once to remove it from the path of project activity, until the wildlife species has escaped.

BIO 14 - All food-related trash items such as wrappers, cans, bottles or food scraps generated during project activities will be disposed of only in closed containers and regularly removed from the proposed project sites. Food items may attract wildlife species onto the proposed project sites, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife will be allowed.

BIO 15 - To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets will be permitted on the project sites.

BIO 16 - The following measures (a-e) will be implemented by BVWSD to ensure protection and no take of blunt-nosed leopard lizards during project implementation:

- a. A final clearance survey will be conducted to ensure that no blunt-nosed leopard lizards are present in the project site.

- b. If no individual blunt-nosed leopard lizards are observed and no burrows are identified within the project sites and a 50-foot avoidance buffer during the final clearance survey, then project activities may proceed.
- c. Alternatively, if suitable burrows that may serve as potential refugia for blunt-nosed leopard lizard are identified that cannot be avoided, and a minimum 50-foot avoidance buffer cannot be maintained, then additional surveys to detect the species will be completed in accordance with CDFW's Approved Survey Methodology For The Blunt-Nosed Leopard Lizard (CDFG 2004).
- d. If a blunt-nosed leopard lizard is observed during project pre-construction or clearance surveys, the USFWS and CDFW will be notified for further guidance.
- e. All vehicle operators will check under vehicles and equipment prior to operation, or if left idle.

BIO 17 - BVWSD will implement the following measures to protect San Joaquin kit fox. These measures have been adapted from the USFWS Standardized Recommendations For Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011):

- a. Pre-construction surveys should be conducted by a qualified biologist no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities.
- b. BIO 18- Construction and other project related activities should avoid den(s) that could be used by San Joaquin kit fox.
- c. If a natal/pupping den is discovered within the project site or within 200 feet of the project boundaries, the USFWS and CDFW should be notified. Natal/pupping dens may not be destroyed while occupied, and a take authorization/permit is required to destroy these dens even after they are vacated.
- d. If dens are identified during pre-construction surveys that may be used by San Joaquin kit fox, protective exclusion zones will be established prior to project activities.
- e. To ensure protection of known dens, exclusion zones should be established 100 feet from the den entrance(s) with fencing that does not prevent access to the den by kit foxes. Acceptable fencing includes untreated wood particle-board, silt fencing, or orange construction fencing, as long as it has opening for kit fox ingress/egress and keeps humans and equipment out.
- f. For potential and/or atypical dens, placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.
- g. Exclusion zones around kit fox dens will be maintained until all construction related

disturbances have been completed. At that time all fencing will be removed to avoid attracting subsequent attention to the dens.

- h. Only essential vehicle operation on existing roads and foot traffic should be permitted in exclusion zones. Otherwise, all construction, vehicle operation, material storage, or any type of surface-disturbing activity should be prohibited or greatly restricted within the exclusion zones.
- i. If den avoidance is not feasible or if buffer zones cannot be maintained, known dens and potential dens should be monitored prior to construction activities.
- j. Known dens and potential dens occurring within the footprint of the project must be monitored for three (3) consecutive days with tracking medium or an infra-red camera beam to determine the current use. If no kit fox activity is observed during this period, the den(s) should be destroyed immediately to preclude subsequent use.
- k. If kit fox activity is observed at the den(s) during this period, the den(s) should be monitored for at least five (5) consecutive nights from the time of the observation to allow any resident animal to move to another den during its normal activity. Only when the den(s) are determined unoccupied may the den(s) be excavated.
- l. Destruction of the den(s) should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den(s) should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter to use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity will cease immediately and monitoring the den as described above should resume. Destruction of the den may be completed when, in the judgment of the biologist, the animal has escaped without further disturbance, from the partially destroyed den.
- m. If any kit fox den is considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities will cease and the USFWS and CDFW will be notified immediately.
- n. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW.

BIO 18 - BVWSD should designate a project representative as the contact for any employee or contractor who finds a dead, injured, or entrapped special-status wildlife species.

BIO 19 - If ground disturbing activities are planned to occur during the breeding season of migratory bird or raptor species (February through mid-September), surveys for active nests will be conducted by a qualified biologist no more than 14 days prior to the start of project activities. Pre-construction surveys will be conducted for nesting migratory birds and raptor species in the project sites and areas that support potential nesting habitat.

BIO 20 - If no active nest(s) are found, then project activities may proceed and no further mitigation measures will be required.

BIO 21 -If active nest(s) are found, then exclusion zones will be established a minimum of 250-feet around a nest. Project activities will avoid disturbance within the exclusion zone during the nesting season.

BIO 22 - To meet the minimum level of protection for Swainson’s hawk, surveys to identify birds and active nest sites should be completed by a qualified biologist for a ½ mile radius around all project activities. Surveys should be completed in accordance with the Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley (Swainson’s Hawk Technical Advisory Committee 2000).

BIO 23 - If project activities are scheduled to occur outside the breeding or nesting season (August through December), then no additional surveys for Swainson’s hawk are required.

BIO 24 - If ground disturbing activities are planned to occur during the breeding or nesting season of Swainson’s hawk (late March through late July) additional surveys to detect adults birds and nest(s) are recommended. The survey periods, times, and number of survey days are as follows:

<b>Survey Dates</b>	<b>Search Image</b>	<b>Survey Time</b>	<b>Number of Surveys</b>
January – March 20	Potential Nest Locations	All day	1 (optional)
March 21 – April 5	Arrival	Sunrise to 1000 1600 to Sunset	3
April 6-April 20	Breeding	Sunrise to 1200 1630 to Sunset	3
April 21-June 10	Nesting (egg-laying & incubation)	Monitor known nest sites only	Initiating surveys is not recommended
June 11 – July 30	Nest sites (post-fledging)	Sunrise to 1200 1600 to Sunset	3

BIO 25 - If surveys locate a nest site within 0.5 mile, a Swainson’s hawk Monitoring and Mitigation Plan will be prepared by a qualified biologist in consultation with the CDFW.

BIO 26 - During the breeding and nesting season (late March through late July), ensure no disturbance or other project related activities that may cause nest abandonment or forced fledging to occur within 0.5 miles of an active Swainson’s hawk nest. Buffer zones may be adjusted in consultation with the CDFW.

BIO 27 - The following measures included in the CDFW’s Staff Report on Burrowing Owl Mitigation (CDFG 2012) will be implemented by BVWSD for the proposed project:

- a. Pre-construction (take avoidance) surveys will be completed by a qualified biologist no less than 14 days prior to ground disturbing activities to detect the presence of burrowing owls in the project site.

- b. If no burrowing owls are detected during pre-construction (take avoidance) surveys, then project activities may proceed.
- c. If burrowing owl presence is detected during pre-construction surveys the owls will be monitored to determine use in the project site.
- d. Avoid impacting burrows occupied during the non-breeding season (by migratory or non-migratory resident burrowing owls).
- e. Avoid disturbing occupied burrows during the burrowing owl nesting season (February 1 through August 31).
- f. Recommended setback distances and restricted activity dates for burrowing owl nesting sites based on the level of disturbance are as follows:

Time of Year	Level of Disturbance		
	Low	Medium	High
April 1 – Aug 15	200 meters	500 meters	500 meters
Aug 16 – Oct 15	200 meters	200 meters	500 meters
Oct 16 – Mar 31	50 meters	100 meters	500 meters

**Groundwater**

GW 1 - Groundwater monitoring wells will be constructed on site before recharge operations begin. Groundwater samples will be collected from each of these wells before recharge operations begin. The purpose of this monitoring is to verify that shallow and deep groundwater beneath the site is free of priority pollutions before initiating recharge activities.

GW 2 - During construction of the recharge basins, approximately 5 feet of fine ground soils (silts and clays) will be excavated from each recharge basin to expose the underlying fine to medium grained sand in the base of each recharge basin. During soil excavation and removal the contractor and inspecting engineer will monitor for evidence of soil contamination (color, odor, buried tanks, pipelines). If contaminated soils are encountered during excavation, these soils will be analyzed to identify the type and extent (vertically and horizontally) of contamination present. Contaminated soils will either be treated on site or disposed of at a hazardous waste landfill.

GW 3 - If contaminated soils are encountered during construction, additional groundwater monitoring wells may be installed to verify that groundwater has not been impacted. As an added measure of protection, BVWSD will cease the construction of recharge basins in and adjacent to contaminated soils. During the operational phase of the Palms project, BVWSD will conduct annual monitoring to verify that groundwater quality is not being adversely impacted by the recharge operation.

## **Cultural Resources**

CULT 1 - Preservation in Place of Archaeological Site RABV-1. The project will be designed to avoid any ground disturbing activities in the area of site RABV-1.

CULT 2 - Consultation with Professional Archaeologist. In the event that archaeological resources are discovered during construction of the project, BVWSD will consult with a professional archaeologist on appropriate measures to preserve and protect the resource.



## Section F. List of Preparers

---

Ginger Gillin – Principal Environmental Scientist, Project Manager. GEI Consultants, Inc.

Stephanie Breeden – Environmental Scientist and Initial Study Author. GEI Consultants, Inc.

Robert Booher, R.E.A. – Robert A. Booher and Associates. Biological Assessment.

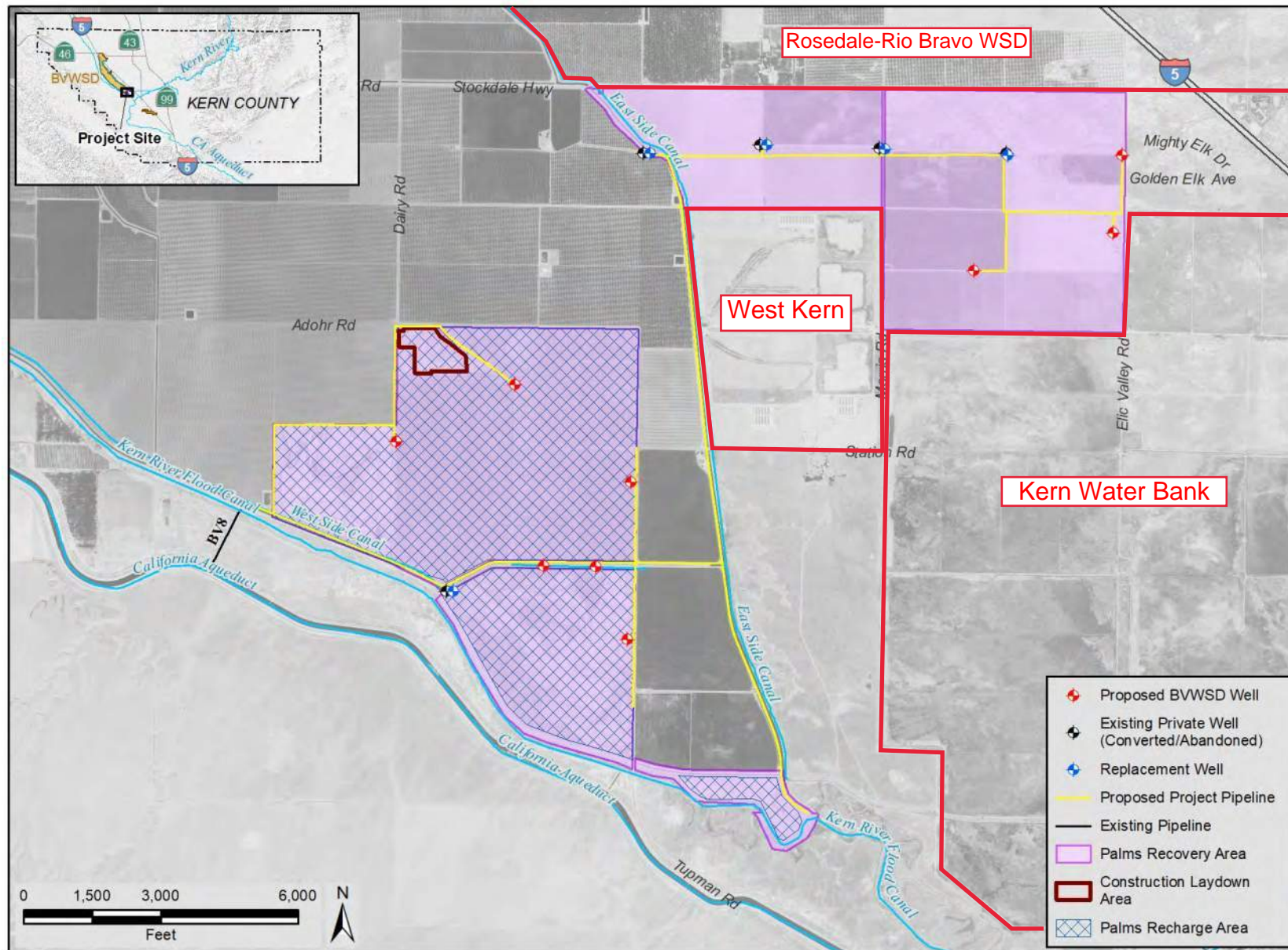
David Fairman – Staff Geologist. Professional Geologist, CA No. 9025. GEI Consultants, Inc. – Groundwater Resources Report

Peter A. Carey, M.A., R.P.A. – Associate Archaeologist. ASM Affiliates – Cultural Resource Survey and Report

David S. Whitley, Ph.D., R.P.A. – Principal Investigator. ASM Affiliates – Cultural Resources Cultural Resource Survey and Report

Chris Petersen – Hydrogeologist, Professional Geologist, CA No. 6189; Certified Hydrogeologist, CA No. 463. GEI Consultants, Inc.

**Annotated Figure 2-2. Recovery Project Location**





January 11, 2021

Jonathan Parker  
Kern Water Bank Authority  
1620 Mill Rock Way, Suite 500  
Bakersfield, California 93311

**RE: Comments on the Draft Environmental Impact Report for the Palms Groundwater Recovery Project - SCH# 2020060315**

Dear Mr. Parker:

South Valley Biology has reviewed the subject Draft Environmental Impact Report (DEIR). Please see the following observations/comments.

### Section 3.2. Biological Resources:

Table 3-1:

- 1) Horn's milkvetch (*Astragalus hornii* var. *hornii*) on or adjacent to the project site should include the Outlet Canal and other periodically flooded areas. This species is known from occurrences in the Outlet Canal just south of the project site and also from some of the recharge basins and water conveyances on the KWB.
- 2) Lesser saltscale (*Atriplex minuscula*) is known to occur in the bush seepweed habitat adjacent to the northeast portion of the project site.

Table 3-2:

- 1) The table indicates that there is no habitat for coast horned lizard (*Phrynosoma blainvillii*) on or adjacent to the project site; however, the bush seepweed habitat adjacent to the northeast portion of the project site provides suitable habitat for this species.
- 2) The table indicates that Tulare grasshopper mouse (*Onychomys torridus* ssp. *tularensis*) is not known to occur at the KWB. This is incorrect. This species has been identified in several areas at KWB, including trapping grids, the Cheng Property, and the saltbush scrub habitat portion of the Nikkel Property.

3-21 Special-status Birds: In paragraph 3, the DEIR correctly indicates that Swainson's hawks (*Buteo swainsoni*) are known to nest at the nearby Tule Elk Reserve; however, this species also regularly nests at the KWB as well.

3-22 Special-status Birds: In paragraph 4, the DEIR states that "...No suitable nesting habitat for tricolored blackbird (*Agelaius tricolor*) is currently present on or adjacent to the project site...". However, this species has nested on occasion at the Tule Elk Reserve and frequently nests at the KWB.

The DEIR concludes the same for yellow-headed blackbird (*Xanthocephalus xanthocephalus*). This species also is known to nest at the KWB.

3-23 Special-status Mammals: In paragraph 2, the DEIR states that the Tulare grasshopper mouse nearest known occurrence is approximately 10 miles away from the project site. This species is known to occur in several areas at KWB, including trapping grids, the Cheng Property, and the saltbush scrub habitat portion of the Nikkel Property.

3-24 Special-status Mammals: In paragraph 1 on that page, the DEIR states "...No evidence of kit fox presence in the Biological Study Area was observed during focused field surveys...". Although I do not doubt this statement in any way, kit foxes are nevertheless known to occur in the surrounding area and the individuals can be wide ranging in their foraging habits. Therefore, it should be expected that this species is likely present at least time to time within the Biological Study Area.

3-31 Impact BIO-1: Horn's milkvetch should also be included in the Special-status Plants that are listed here, as it is also known to occur nearby within the Outlet Canal, similar to slough thistle.

3-32 Mitigation Measure BIO -1: Our experience has been that unless blunt-nosed leopard lizard surveys consistent with the 2019 CDFW protocols or some other CDFW-approved methodology are conducted, it is unlikely that fencing will be allowed to be installed. CDFW typically requires a very detailed fencing plan be prepared and approved prior to installing any exclusionary/barrier fencing. Additionally, CDFW does not normally approve fence installation within 50 feet of burrows that could be used by species such as Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) or San Joaquin antelope squirrel (*Ammospermophilus nelsoni*) unless it can be demonstrated through an approved investigative trapping effort or other agreed upon method that these species are not present.

3-32 and 3-33 Special-status Birds: While I do not necessarily disagree with most of the statements and conclusions in these paragraphs, based on comments by CDFW in regard to Swainson's hawks they stated that ..."The trees within the Project represent some of the only remaining suitable nesting habitat in the local vicinity". Hence, it seems that CDFW may view impacting a total of 10 acres of foraging habitat for this species as a significant impact. Swainson's hawks are definitely known to nest in the area nearby the project site and likely forage in some portions of the project site from time to time.

3-34 Mitigation Measure BIO 2b: The DEIR is proposing that a nest survey for potential Swainson's hawk nesting trees be conducted within 0.25 mile of the project site. From my experience, CDFW will typically require a nest tree survey for a minimum of 0.5 mile surrounding the project.

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,



James W. Jones, Jr.  
President and Senior Biologist III