State Water Resources Control Board

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Agency Secretary

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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.

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

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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.

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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., [illegible]l, May 12, 2005, Kern Water Bank A[illegible]ority 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: Result s 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).

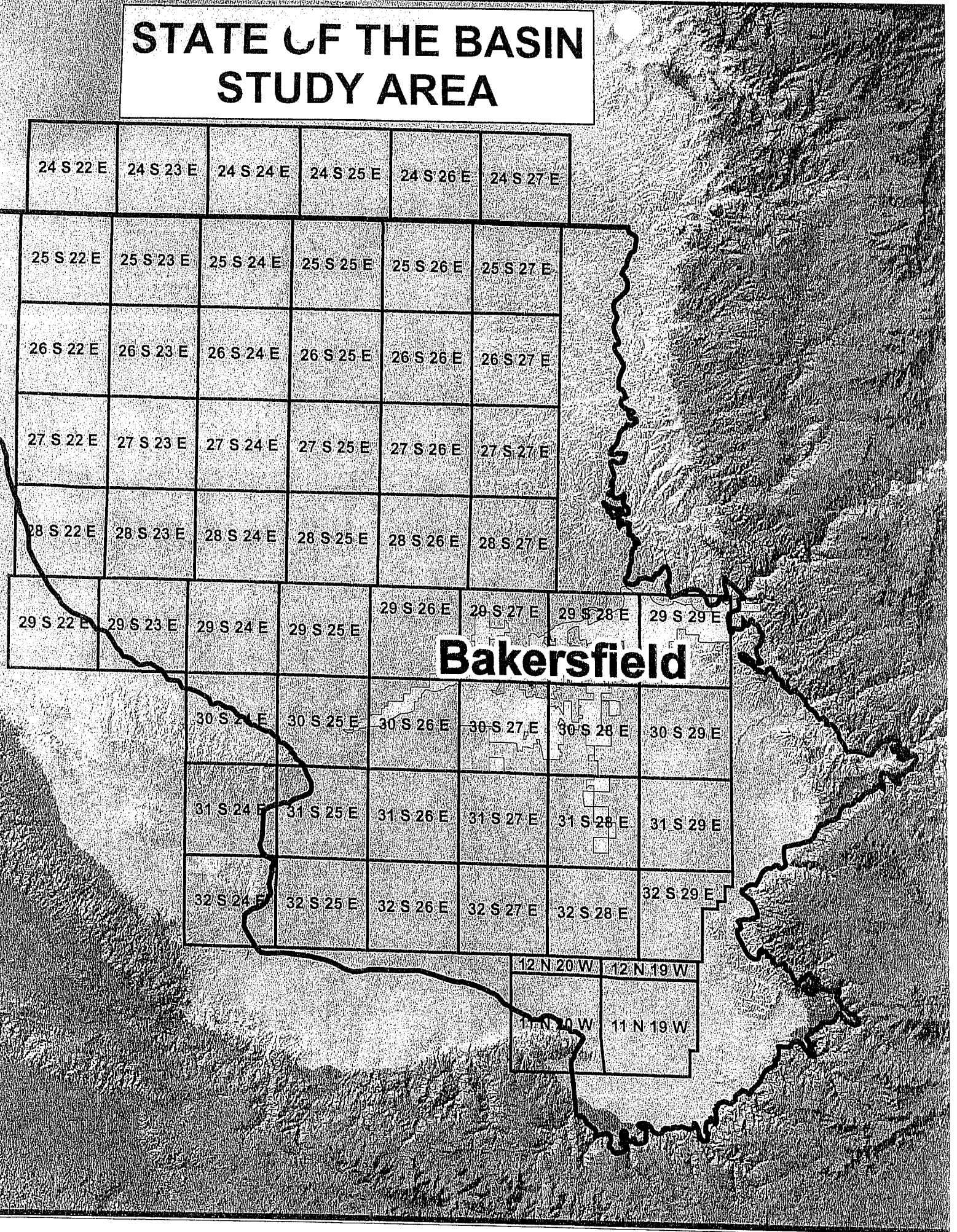
Swartz, R.J., 1995, A study of the occurrence of arsenic on the Kern Fan element of the Kern Water Bank, southern San Joaquin Valley, Ca., MSC thesis, CSUB, 138p.

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 2nd Point diverting and recording all rights downstream of 2nd Point.


STATE OF THE BASIN STUDY AREA
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Bakersfield
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31 S 28 E
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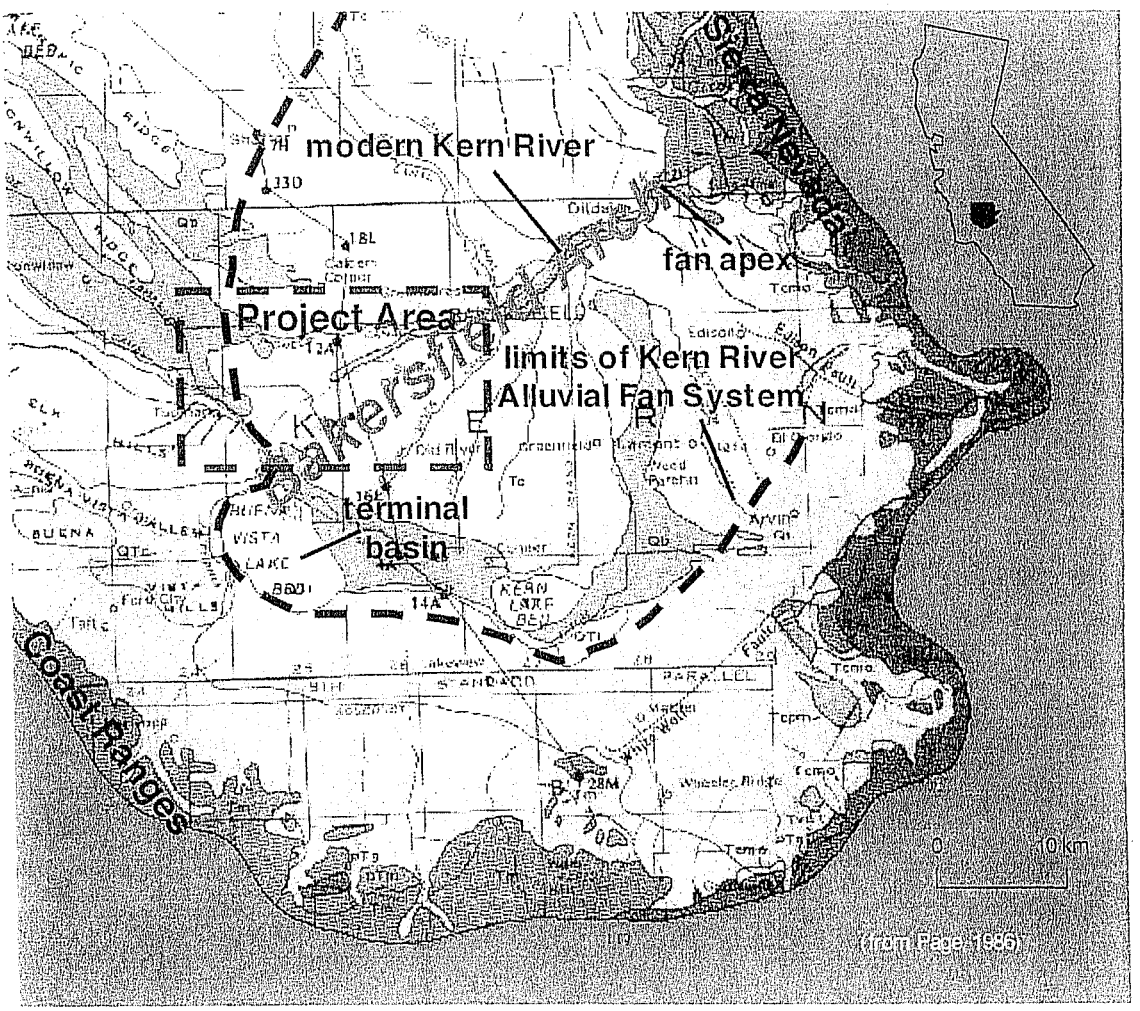
12 N 20 W
12 N 19 W
11 N 20 W
11 N 19 W

Map 4



Q_{Tc} Quaternary alluvium

Q_{lc} Quaternary lacustrine clays

Q_f Quaternary fluvial (stream) deposits

T_m 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 TertiaryPeriod (past 60-70 Myr).

Map 5