Appendix N

Water Resources

Appendix N-1

Water Resources Information

AGREEMENT FOR WATER ACQUISITION BY HYDROGEN ENERGY INTERNATIONAL LLC FROM BUENA VISTA BRACKISH GROUNDWATER REMEDIATION PROJECT

THIS AGREEMENT ("Agreement") is made and entered into as of the Effective Date by and between HYDROGEN ENERGY CALIFORNIA LLC ("HYDROGEN ENERGY"), successor-in-interest to the August 15, 2008 Summary of Proposed Water Transfer Terms and a direct subsidiary of Hydrogen Energy International LLC, and the BUENA VISTA WATER STORAGE DISTRICT ("BV"). BV and HYDROGEN ENERGY are sometimes referred to individually as a "Party" and collectively as the "Parties."

INTRODUCTION

BV will operate a program for the recovery and delivery of brackish groundwater (the "BV Brackish Groundwater Remediation Project" as defined below). This Agreement sets forth the terms and conditions for HYDROGEN ENERGY to acquire water produced from the BV Brackish Groundwater Remediation Project. A map showing the proposed location of BV Brackish Groundwater Remediation Project facilities is set forth on Exhibit "A", Facility Map, and a description of the program for the BV Brackish Groundwater Remediation Project is set forth in more detail in Exhibit "B", Brackish Groundwater Remediation Project Description, both of which Exhibits "A" and "B" are attached hereto and by reference made a part hereof.

DEFINITIONS

1. **AF, AFY:** Acre-feet, or acre-feet of water per year.

2. **BV Brackish Groundwater Remediation Project:** A stand alone water management program or a component of BV's Water Management Program (the "BV Water Management Program") under which BV intends to sell, distribute, or otherwise dispose of water, the Brackish Groundwater Remediation Project being specifically described in Exhibit B.

3. **BV Sale Water:** Water recovered or withdrawn and purchased by HYDROGEN ENERGY (or made available for purchase under this Agreement) pursuant to the BV Brackish Groundwater Remediation Project and this Agreement.

4. **CEQA:** California Environmental Quality Act, as presently existing and any amendments thereto.

5. **HYDROGEN ENERGY Project:** HYDROGEN ENERGY's proposed development, construction, and operation of certain facilities to gasify petroleum coke or a petroleum coke blend to produce hydrogen-rich, substantially carbon-free fuel gas and carbon dioxide gas as a result of, among other aspects, long-term carbon sequestration, and

to use such fuel gas in the generation of baseload electric power in the State of California at a facility located in Kern County, within or reasonably near Section 16, T30S, R24E.

6. **Escalator:** An annual adjustment of the price per AFY of water pursuant to the formula as set forth in Section 4.F. of this Agreement.

7. **Point of Delivery:** The Point of Delivery of BV Sale Water delivered to HYDROGEN ENERGY via direct delivery of brackish water extracted from the groundwater basin, shall be within Kern County and within or reasonably near Section 16, T30S, R24E. (*See* Exhibit "A".) The exact location and type of Point of Delivery facilities shall be subject to the mutual agreement of the Parties.

8. **Project Parameters:** Project Parameters mean the facilities, management, and operations necessary to implement and carry out the provisions of the BV Brackish Groundwater Remediation Project as more particularly described in Exhibit B.

RECITALS

1. BV is a public agency organized in accordance with California Water Storage District Law (Division 14, commencing with Section 39000, of the California Water Code) for the purpose of acquiring, storing, distributing, and replenishing water supplies in Kern County, California.

2. HYDROGEN ENERGY is a Delaware limited liability company.

3. HYDROGEN ENERGY desires to purchase up to 7,500 AFY of BV Sale Water.

4. BV is authorized to sell, distribute, and otherwise dispose of water not necessary for the uses and purposes of the District (Water Code Section 43001).

5. BV is the owner of the BV Sale Water and has the right to extract, divert, transport, and sell such waters to HYDROGEN ENERGY pursuant to the terms as set forth in this Agreement.

6. BV desires HYDROGEN ENERGY to participate in the BV Brackish Groundwater Remediation Project as described in the terms and conditions set forth herein.

7. HYDROGEN ENERGY is not able to take immediate delivery of the BV Sale Water, but shall, pursuant to the terms hereof, make payments to BV for the right to obtain up to 7500 AFY of BV Sale Water in the future from the BV Brackish Groundwater Remediation Project (the "Reservation Fee Payment") as provided in Section 4.D herein.

NOW, THEREFORE, IN CONSIDERATION of the payment of money and the mutual promises of the Parties as set forth herein, it is agreed as follows:

AGREEMENT

1. **Description of Project.**

A. **BV Brackish Groundwater Remediation Project.** The BV Brackish Groundwater Remediation Project states that, within the Project Parameters as described in Exhibit B, approximately 12,000 AFY of brackish groundwater generally underlying the BV boundaries in Kern County, California may be recovered or withdrawn from the groundwater basin and put to beneficial use.

B. **HYDROGEN ENERGY Project.** The HYDROGEN ENERGY Project desires the right to purchase up to 7,500 AFY of BV Sale Water in accordance with and pursuant to this Agreement, the Project Parameters, and the following:

i. **Extraction, Delivery and Measurement.** Extraction/transportation facilities will be constructed which meet reasonable design and construction standards acceptable to BV, have prior approval of HYDROGEN ENERGY, which approval shall not be unreasonably withheld, and which will have the capacity to deliver BV Sale Water purchased by HYDROGEN ENERGY to the HYDROGEN ENERGY Project. BV shall use best efforts to make deliveries of BV Sale Water as scheduled by HYDROGEN ENERGY in accordance with Section 1.B.iii. Title to and custody of all BV Sale Water delivered hereunder shall pass to HYDROGEN ENERGY at the Point of Delivery. As between the Parties, BV shall be deemed to be in exclusive control and possession of the BV Sale Water until the same shall have been delivered to HYDROGEN ENERGY at the Point of Delivery, and HYDROGEN ENERGY shall be deemed to be in exclusive control and possession thereof after receipt of same at the Point of Delivery. The risk of loss for all BV Sale Water delivered hereunder shall be and remain with the Party having control and possession of the BV Sale Water as provided herein.

ii. **Inspection**. BV shall provide and be responsible for the operation, maintenance, testing, and calibration of all equipment, including the water meter (the "Water Meter"), up to and at the Point of Delivery. HYDROGEN ENERGY shall provide and be responsible for the operation, maintenance, testing, and calibration of all equipment after the Point of Delivery. The Water Meter shall be deemed the official metering station with regard to delivery hereunder. HYDROGEN ENERGY shall have the right, at its own expense, upon reasonable notice, which is generally deemed to be ten (10) days after written notice to BV, to inspect the equipment, including the Water Meter, associated with the Point of

Delivery. If for any reason the Water Meter or related equipment is out of service, out of repair, or is registering inaccurately to a substantial degree, the Party having control and possession of the equipment in question shall service or repair the out of service, out of repair, or inaccurate equipment as soon as reasonably practicable and the Parties, based on the best available data, shall determine the quantity of BV Sale Water until such time as the equipment or Water Meter is serviced, repaired, or made accurate. Neither Party shall interfere with or operate the facilities or equipment described in this Agreement that are known by the other Party to be owned, operated, or controlled by the other Party.

iii. **Purchase and Schedule.** Except as otherwise expressly provided herein, BV will annually make available to HYDROGEN ENERGY, and HYDROGEN ENERGY will annually purchase from BV, or pay BV for, the greater of (a) the minimum amount of the BV Sale Water as provided in the Minimum Purchase AFY on the table below ("Table") or (b) the actual BV Sale Water delivered at the Point of Delivery up to a maximum of 7,500 AFY from and after January 1, 2015, during the Term (as defined in this Agreement) or any such extension of the Term, in accordance with the following Table.

From	To	Minimum Purchase AFY	Maximum Purchase AFY
Jan. 1, 2009	Dec 31, 2014	0	7500
Jan. 1, 2015	Dec 31, 2015	1875	7500
Jan 1, 2016	Dec 31, 2016	3000	7500
Jan 1, 2017	Dec 31, 2017	4125	7500
Jan 1, 2018	Dec 31, 2018	5250	7500
Jan 1, 2019	Dec 31, 2039	7500	7500

HYDROGEN ENERGY has no obligation to schedule or receive any BV Sale Water, but nothing in this sentence relieves HYDROGEN ENERGY of its obligation to make payment for the minimum amount of the BV Sale Water as provided in the Minimum Purchase AFY column as set forth in the Table, provided BV would be able to provide the Minimum Purchase quantities if HYDROGEN ENERGY were to schedule them. HYDROGEN ENERGY shall schedule deliveries with BV in a timely manner to enable BV to deliver such BV Sale Water. HYDROGEN ENERGY will provide BV an indicative annual delivery schedule on or before November 1 of each calendar year for the next succeeding calendar year, and such schedule will include the desired monthly delivery schedules, but HYDROGEN ENERGY may, upon reasonable notice to BV, revise the schedule during the calendar year. No monthly scheduled amount shall exceed 14% of the total annual Maximum Purchase AFY.

If HYDROGEN ENERGY fails to take delivery at the Point of Delivery of any BV Sale Water made available by BV at the Point of Delivery and required to be purchased by HYDROGEN ENERGY pursuant to the above Table and consistent with the annual delivery schedule as described above, such BV Sale Water shall revert to BV without payment by BV and without setoff or other compensation to HYDROGEN ENERGY.

C. **Water Quality.** BV shall use its best efforts to provide BV Sale Water which shall have a total dissolved solids ("TDS") averaging approximately 2,000 mg/L with an acceptable range of from approximately 1000 mg/L to approximately 4000 mg/L, or as may otherwise be necessary to supply the quantity of water to be delivered pursuant to this Agreement.

D. **Point of Delivery.** BV will deliver the BV Sale Water at the Point of Delivery and consistent with the terms of this Agreement. Both Parties agree that deliveries may from time to time be delayed or interrupted as a result of pipeline, facility, and/or project maintenance requirements, and that the Parties will endeavor to coordinate such occurrences with one another, keep such occurrences to a minimum to the extent reasonably practicable, and that such normal occurrences shall not be deemed a breach of an obligation of either of the Parties hereto.

E. **Redundant Supply.** The Parties will cooperate in the development of a short-term alternative water supply to minimize or eliminate possible delivery interruptions.

F. **Waiver of Other Water and Pricing**. During the term of this Agreement, HYDROGEN ENERGY knowingly and voluntarily waives any and all water rights, or rights to water service, from or through BV with respect to Kern River Water, State Project Water or any other water supply available to BV on the area of land on which the HYDROGEN ENERGY Project facility will be situated (the "Facility Footprint") except as provided under this Agreement. Any such rights that may have in the past been used on or for the benefit of the Facility Footprint may be used by BV in any manner in its sole discretion without cost, offset or other compensation to HYDROGEN ENERGY. HYDROGEN ENERGY may, however, use its land other than the Facility Footprint for agricultural and other purposes for which BV shall provide water service upon the same terms and conditions as other similarly situated lands within BV, and in accordance with then existing BV policies. In addition, HYDROGEN ENERGY knowingly and voluntarily waives any and all right(s) to be charged a price for the BV Sale Water other than in accordance with and as is specifically set forth in this Agreement. In addition, HYDROGEN ENERGY knowingly and voluntarily waives any rights to, and covenants that it shall not, use groundwater underlying its property for Project operational

purposes on the Facility Footprint, except for the limited purpose set forth in 1 E in cooperation with BV.

2. Insurance, Representations, Warranties, Reliance, and Covenants.

A. **Insurance.**

i. BV has insurance coverage for their facilities and operations, including those facilities and operations involved in the BV Brackish Groundwater Remediation Project. BV shall, on execution of this Agreement, provide HYDROGEN ENERGY with a copy of such policies and instruct the insurance companies to send HYDROGEN ENERGY any material notices from the insurance company including notices of non-payment of premium or non-renewal of the policies.

ii. HYDROGEN ENERGY has insurance coverage for their facilities and operations, including those facilities and operations involved in the BV Brackish Groundwater Remediation Project. HYDROGEN ENERGY shall, on execution of this Agreement, provide BV with a copy of such policies and instruct the insurance companies to send BV any material notices from the insurance company including notices of non-payment of premium or non-renewal of the policies.

B. **Representations, Warranties, Covenants, and Reliance.**

i. **BV represents and warrants as follows:**

(1) BV shall, prior to commencement of the BV Brackish Groundwater Remediation Project and delivery of BV Sale Water pursuant thereto, complete an environmental review under CEQA. In completing this review, BV retains all of its rights and powers under CEQA, including without limitations the authority to: (i) conduct a full evaluation of the environmental impacts of the proposed project, feasible alternatives to the proposed project, and feasible mitigation measures; (ii) adopt feasible mitigation measures and/or alternatives in order to avoid or lessen significant environmental impacts resulting from the proposed project; (iii) determine that any significant environmental impacts of the proposed project that cannot be mitigated are acceptable due to overriding considerations; and/or (iv) decide to deny its approval of the proposed project and terminate this Agreement due to any significant, unmitigated environmental impacts resulting from the proposed project.

(2) The BV Brackish Groundwater Remediation Project includes the ability to extract and deliver to HYDROGEN ENERGY under this

Agreement at least 7,500 AFY of water meeting the standards set forth in this Agreement.

(3) BV has legally enforceable rights to water, including water from the Kern River and its tributaries, to divert, transport, spread, recharge, bank extract and deliver water to HYDROGEN ENERGY as set forth in the BV Brackish Groundwater Remediation Project and to carry out its performance under the terms of this Agreement.

(4) Water recovered or withdrawn under the BV Brackish Groundwater Remediation Project may be delivered inside Kern County to HYDROGEN ENERGY.

(5) BV represents and warrants that its entry into this Agreement does not create or result in the breach of any other agreement to which BV is a party or to which BV is otherwise subject to or bound.

(6) BV represents and warrants that there is no pending or threatened litigation involving the BV Brackish Groundwater Remediation Project or the ability of BV to sell Program water to HYDROGEN ENERGY.

(7) BV is causing an engineering analysis to be conducted, which is anticipated to conclude that 7,500 AFY can be produced by the BV Brackish Groundwater Remediation Project beginning in the year 2015, and continuing throughout the term of this Agreement.

ii. **HYDROGEN ENERGY represents and warrants as follows**:

(1) HYDROGEN ENERGY represents and warrants that entry into this Agreement does not create or result in the breach of any other agreement to which HYDROGEN ENERGY is a party or to which HYDROGEN ENERGY is otherwise subject to or bound.

(2) HYDROGEN ENERGY is currently able and shall make the agreed payments as forth in this Agreement.

(3) HYDROGEN ENERGY represents and warrants that, to its knowledge at the time HYDROGEN ENERGY executed this Agreement, there is no pending or threatened litigation involving HYDROGEN ENERGY or HYDROGEN ENERGY'S Project.

iii. **Reliance.** The Parties have relied on the forgoing representations, warranties, and covenants as a material inducement to execute this Agreement, and should any material representation not be correct or true, it shall constitute a material breach of this Agreement.

3. **Term and Termination.**

A. The initial term of this Agreement shall commence November, _____ 2009 ("Effective Date") and shall continue to and including December 31, 2039 (the "Term").

B. HYDROGEN ENERGY may terminate this Agreement at any time during the period commencing on the Effective Date and ending on December 31, 2014 upon ninety (90) days written notice to BV of HYDROGEN ENERGY's intent to terminate (the "Early Termination Period"); *provided, however*, termination by HYDROGEN ENERGY during the Early Termination Period shall not relieve HYDROGEN ENERGY of any payment obligations that would otherwise become due prior to the end of such ninety- (90) day period. In the event HYDROGEN ENERGY fails to commence or permanently ceases operation of the HYDROGEN ENERGY Project for reasons set forth in Section 19 below, HYDROGEN ENERGY may terminate this Agreement at any time after the Early Termination Period upon one hundred eighty (180) days prior written notice to BV, and shall pay when due, all obligations that would have typically accrued during the next two succeeding calendar years. From and after the effective date of any termination as provided herein, neither Party shall have any obligation of any kind to the other Party under this Agreement, except on account of breaches of any representation, warranty, or covenant of the Party in this Agreement occurring prior to the effective date of the termination.

C. BV may terminate this Agreement if the environmental review under CEQA referenced in Section 2.B.i(1) reveals any significant, unmitigated environmental impacts, and if BV does not find that these significant, unmitigated environmental impacts are acceptable due to overriding considerations, or in the event BV permanently ceases operations of its Brackish Groundwater Remediation Project for reasons set forth in Section 19 below.

D. Either Party may terminate this Agreement if the other Party breaches any material obligation under this Agreement and such breach continues for a period of ninety (90) days, or such other period as may be reasonable under the circumstances, after the date on which written notice is issued by the non-breaching Party. The non-breaching Party shall be entitled to seek any and all legal or equitable damages and/or remedies as a result of the breaching Party's breach.

4. **Payment and Charges.**

A. **Facility Construction.** BV shall, in good faith and after consultation with HYDROGEN ENERGY estimate, and, as a reservation right as provided in section 4.D below, HYDROGEN ENERGY agrees to pay an amount equal to, all of the costs of, including the acquisition of additional easements if BV's existing property rights are insufficient for purposes of establishing necessary rights of way, design, construction, and inspection of, the necessary improvements for water extraction, monitoring, and conveyance facilities (the

"Facilities") reasonably required for BV to extract, monitor, and convey BV Sale Water to HYDROGEN ENERGY pursuant to this Agreement. BV shall, in cooperation with HYDROGEN ENERGY, provide a proposed schedule for construction of the Facilities. BV shall, at its sole expense, (i) use its best efforts to construct the Facilities according to the schedule and using the same reasonable design and construction specifications as are approved by HYDROGEN ENERGY.and (ii) provide HYDROGEN ENERGY with corresponding cost estimates related to the improvements before BV commences such construction, which cost estimates will be calculated and paid as a component of the Reservation Fee Payment as provided in section 4.D below.

B. **Water Rate.** The water rate (the "Water Rate") shall be the initial Water Rate of BV Sale Water which on June 1, 2008, is $450.00 per AF as may be adjusted as provided in Section 4.F.

C. **Facility OMP&R Rate.** Annually on or before November 1 of each calendar year during the Term, BV shall provide HYDROGEN ENERGY with an estimate of proposed facility operation, maintenance, power and replacement costs associated with the BV Sale Water and necessary related facilities. Upon cost substantiation, HYRDOGEN ENERGY shall reimburse BV for actual, reasonable facility operation, maintenance, power, incremental administration, and replacement costs associated with and directly attributable to the extraction, monitoring, and conveyance of the BV Sale Water and all facilities required to meet the obligations of BV hereunder in order to supply the BV Sale Water as provided herein (the "Facility OMP&R Rate").

D. **Reservation Fee Payment.** For the period until December 31, 2014, HYDROGEN ENERGY shall pay to BV an annual non-refundable payment (the "Reservation Fee Payment") as provided herein to reserve the availability of Sale Water. The Reservation Fee Payment shall be an amount equal to the aggregate of (i) the annual cost estimate for that year provided by BV under section 4 A., plus (ii) 7,500 AF times ("x") the then applicable Water Rate x 15%, payable in quarterly installments as set forth in Section 4.G. below, which will increase to 7,500 AF x Water Rate x 20% when the California Energy Commission has given the HYDROGEN ENERGY Project a favorable preliminary staff assessment, but no later than January 1, 2010. If the aggregate of the cost estimates provided by BV under section 4 A. (ii) above for the Facilities are less than the actual costs incurred by BV for construction of the Facilities as shown by an interim or by a final accounting for construction of the Facilities, then the Reservation Fee Payment will increase in an amount equal to the difference, which will be payable within thirty (30) days of invoice by BV accompanied by the interim or final accounting. Alternatively, if such cost estimates are more than the actual costs incurred by BV for construction of the Facilities, then HYDROGEN ENERGY will receive a credit against its next

due quarterly installment of the Reservation Fee Payment following completion of the Facilities equal to the difference.

E. **Minimum Annual Payment.** The Minimum Annual Payment for each year to and including 2014 is the Reservation Fee Payment for that particular year. The Minimum Annual Payment for each year after 2014 is (i) the sum of the Water Rate multiplied by the Minimum Purchase Quantity for the year as set forth in the Table under section 1 B. (iii) above, plus (ii) the Facility OMP&R Rate, plus (iii) any amounts scheduled pursuant to Section 4 A. The Minimum Annual Payment for each year shall be paid in installments as set forth in Section 4.G. below; *provided, however*, HYDROGEN ENERGY shall not be obligated to make the Minimum Annual Payment for any year after 2014 to the extent BV is not able to provide the Minimum Purchase quantity during that year if HYDROGEN ENERGY were to schedule it, unless the inability of BV to deliver is caused by HYDROGEN ENERGY's failure to pay for the facilities referenced in Section 4 A. above.

F. **Escalator.** The initial Water Rate shall be adjusted annually beginning January 1, 2009, during the term of this Agreement using the average of i) the percentage change in the Consumer Price Index on a calendar year basis (All Urban Consumers – All Items – Southern California Area – starting June 2008 with a base index of 229.033) and ii) the percentage change in the State Water Project ("SWP") unit costs of BV, as adjusted for long term reliability, which shall be determined by dividing BV's total initial annual financial obligation for BV's full SWP Table A Amount by BV's SWP Table A Amount times the most current long-term average delivery estimate of SWP Table A deliveries from the Delta ("Average Delivery Estimate"), as set forth in the latest available Department of Water Resources State Water Project Delivery Reliability Report ("Report") . If the Average Delivery Estimate to be used is less than 20%, then the Average Delivery Estimate will be deemed to be 20% for purposes of this section. Currently, the Average Delivery estimate is calculated at 63%, as set forth in Table 6.4 of the 2007 report published August 2008. In the event the Report is no longer published, or the average delivery estimate is no longer calculated, the Parties shall develop a similar escalator factor to be used.

G. **Payment of Charges and Credit.** The Reservation Fee Payment for the year 2009, in the amount of $515,531.25, and the payment to BV for additional expenses in the amount of $50,824.40, shall be paid to BV within ten (10) days of Hydrogen Energy's execution of this Agreement. The Minimum Annual Payment, as well as any other amounts to be paid pursuant to this Agreement, shall be made in advance of water deliveries, and in four (4) installments, to wit: 25% on March 31st , 25% June 30th , 25% September 31st, and 25% December 31st of each year of the term. The payments shall be made on the last business day preceding the above installment dates by wire transfer to BV as described in Section 10 below. There will be a five (5) year potential credit

period with respect to charges paid by HYDROGEN ENERGY to BV under this section 4 G. If any person, entity or organization within a period of five (5) years from the date of this Agreement seeks to obtain water service through or from BV, similar to the water service provided to HYDROGEN ENERGY, and if such water service requires the use of any part of the Facilities, then BV shall charge that person, entity or organization a proportionate share of the total construction costs of the Facilities and shall apply that amount when received by BV as a credit against the amounts payable by HYDROGEN ENERGY under this section 4 G. BV's determination of the proportionate share to be paid will take into consideration the amount of third party use, total Facility capacity, and the Facilities' expected useful life, and will be subject to consultation with HYDROGEN ENERGY. No such third party use will interfere with sale and delivery of BV Sale Water to HYDROGEN ENERGY consistent with the intent and terms of this Agreement. All rights to a credit will terminate at the end of the five (5) year period.

H. **Fees and Expenses.** HYDROGEN ENERGY shall be responsible for any and all regulatory and permitting fees and costs associated with the water transfer and transportation of BV Sale Water.

I. **CEQA and CEC Compliance.** HYDROGEN ENERGY and BV shall cooperate with one another with respect to CEQA and California Energy Commission ("CEC") compliance pertaining to the proposed sale of the BV Sale Water. HYDROGEN ENERGY shall be solely responsible for all fees, costs, and expenses associated with CEQA compliance to construct and operate the Facilities under this Agreement (including reasonable litigation costs), CEC, and any other regulatory agency compliance, whether incurred by BV or HYDROGEN ENERGY.

J. **Suspension of Payment.** Should BV fail to deliver the BV Sale Water as provided in this Agreement for any reason, HYDROGEN ENERGY shall be excused from payment for the amount of BV Sale Water that BV is not able to deliver unless caused by HYDROGEN ENERGY's failure to construct or pay for the facilities as provided in Section 4 A. above. If HYDROGEN ENERGY and BV cannot agree on the duration of the excused payment, the term of the excused payment and the commencement of future payments shall be determined by mediation as set forth in Section 7.A. of this Agreement, and during the pendency of such dispute resolution, the Parties will not otherwise suspend performance under this Agreement. Should HYDROGEN ENERGY fail to make payments when due for BV Sale Water delivered to the Point of Delivery, or made available at such location pursuant to the terms of this Agreement, after notice and opportunity to cure as provided in this Agreement, BV may suspend its delivery obligations during any such failure.

K. **BV Operations.** BV will maintain and operate its assets in a manner that permits BV to perform its obligations under this Agreement.

L. **BV Cooperation.** In the event that HYDROGEN ENERGY requires for operation of the HYDROGEN ENERGY Project during any period any quantity of water beyond that which BV is committed to supply under this Agreement, BV will negotiate in good faith with HYDROGEN ENERGY for an additional supply. If BV is for any reason unable to supply all or any portion of the BV Sale Water set forth in the Table, then BV will reasonably cooperate with HYDROGEN ENERGY as requested by HYDROGEN ENERGY to enable HYDROGEN ENERGY to acquire and receive, from sources within or without BV, the water that BV is committed to, but cannot, supply. Such cooperative efforts shall include without limitation: (i) providing capacity in the facilities described in Section 4.A up to the full capacity of those facilities; (ii) to the extent the facilities are non-operable or cannot convey the maximum amount of water set forth in the Table, by providing unused capacity in other facilities of BV so long as such other waters do not materially affect water quality; (iii) cooperating in exchange transactions; and (iv) assisting HYDROGEN ENERGY or its designee(s) in acquiring easements for pipelines and other facilities necessary for the delivery of such water to HYDROGEN ENERGY. BV shall not be required to cooperate to the extent such cooperative efforts will unreasonably affect BV's primary obligation of delivering/transporting water for irrigation purposes and/or prior historic practices. HYDROGEN ENERGY shall reimburse BV for its reasonable costs and expenses incurred in any such cooperative efforts; provided, nothing in this sentence shall limit any of HYDROGEN ENERGY's rights against BV on account of any breach of any representation, warranty or covenant of BV in this Agreement.

5. Conditions Precedent/Subsequent.

A. **HYDROGEN ENERGY Conditions Precedent.** HYDROGEN ENERGY's obligation to purchase BV Sale Water hereunder is subject to satisfaction or express written waiver by HYDROGEN ENERGY of each of the following conditions precedent. Failure of any of the following conditions to be met to the satisfaction of, or waived by, HYDROGEN ENERGY shall entitle HYDROGEN ENERGY to terminate this Agreement, except for the obligations to make Reservation Fee Payments already incurred as provided herein. HYDROGEN ENERGY shall timely communicate such failure to BV in writing.

i. There are no material, adverse changes to the representations and warranties made by BV in Section 2.B.

ii. Delivery by BV of an opinion of its legal counsel addressed to HYDROGEN ENERGY that this Agreement has been duly authorized,

executed, and delivered by BV and constitutes the valid and binding obligation of BV and each of them enforceable against BV in accordance with its terms, subject to the effect of any bankruptcy, insolvency, reorganization, moratorium or other laws or judicial decisions affecting the enforcement of creditors' right generally, including, but not limited to, the effect of statutory and other laws or judicial decisions regarding fraudulent conveyances or transfers and preferential transfers; and except as set forth in Section 2.B.i.(6) that presently there is no litigation in which BV is a party which in any way affects BV's ability to perform this Agreement.

iii. HYDROGEN ENERGY's reasonable satisfaction that all CEQA and other environmental obligations, if any, are complete, including the passage without any challenge of the applicable statute of limitations under CEQA for challenging the implementation of this Agreement.

B. **BV Conditions Precedent.** BV's obligation to sell the BV Sale Water hereunder is subject to satisfaction or express written waiver by BV of each of the following conditions precedent. Failure of any of the following conditions to be met to the satisfaction of or waived by BV shall entitle BV to terminate this Agreement. BV shall timely communicate such failure to HYDROGEN ENERGY in writing.

i. There are no material, adverse changes to the representations and warranties made by HYDROGEN ENERGY in Section 2.B.

ii. Delivery by HYDROGEN ENERGY of an opinion of its legal counsel addressed to BV and BV, jointly and severally, that this Agreement has been duly authorized, executed, and delivered by HYDROGEN ENERGY and constitutes the valid and binding obligation of HYDROGEN ENERGY enforceable against HYDROGEN ENERGY in accordance with its terms, subject to the effect of any bankruptcy, insolvency, reorganization, moratorium or other laws or judicial decisions affecting the enforcement of creditors' right generally, including, but not limited to, the effect of statutory and other laws or judicial decisions regarding fraudulent conveyances or transfers and preferential transfers; and except as set forth in Section 2.B.ii.(3) that presently there is no litigation in which HYDROGEN ENERGY is a party which in any way affects HYDROGEN ENERGY's ability to perform this Agreement.

iii. BV's reasonable satisfaction that all CEQA and other environmental and permitting obligations, if any, are complete.

6. **Material Default.** In the event that either HYDROGEN ENERGY or BV is in material default of this Agreement, the non-defaulting Party shall provide written

notice to the defaulting Party, identifying with reasonable specificity the nature of the claimed default. A material default includes HYDROGEN ENERGY failing to pay any charge or amount when due under this agreement, or BV failing to deliver water to HYDROGEN ENERGY. If the defaulting Party has not cured the event(s) of material default which is (are) identified in the notice required by this Article within 10 business days after receipt of written notification, or such other period as is reasonable under the circumstances, the non-defaulting Party shall be entitled to any and all remedies which may be available to it at law or in equity. This provision is not intended to provide a separate termination right, which is set forth in Section 3 C. above.

Each Party acknowledges that money damages may not be an adequate remedy for violations of this Agreement and that a non-defaulting Party may, in its sole discretion, seek and obtain from a court of competent jurisdiction specific performance or injunctive or such other relief as such court may deem just and proper to enforce this Agreement or to prevent any violation hereof. Each defaulting Party hereby waives any objection to specific performance or injunctive relief. The rights granted herein are cumulative.

7. **Dispute Resolution**. For matters involving other than a material default of this Agreement, the following provisions shall apply:

   A. **Mediation**. The Parties agree that any and all disputes, claims or controversies arising under this Agreement, whether for breach, enforcement, or interpretation thereof, shall be submitted to mediation in a mutually agreeable venue and if the matter is not resolved through mediation, then it may be submitted for non-binding arbitration as provided in Section 8.B. below. Any affected Party(ies) may commence mediation by providing the other affected Party(ies) a written request for mediation, setting forth the subject of the dispute and the relief requested. The affected Parties shall cooperate with one another in selecting a mediator and in scheduling the mediation proceedings. The affected Parties covenant that they shall participate in the mediation in good faith, and that they shall share equally in costs charged by the mediator. All offers, promises, conduct and statements, whether oral or written, made in the course of the mediation by any of the Parties, their agents, employees, experts and attorneys, and by the mediator or any of the mediator's employees, are confidential, privileged and inadmissible for any purpose, including impeachment, in any arbitration or other proceeding involving the Parties, provided that evidence that is otherwise admissible or discoverable shall not be rendered inadmissible or non-discoverable as a result of its use in the mediation. Any affected Party may request arbitration with respect to the matters submitted to mediation by filing a written request for arbitration at any time following the initial mediation session or 45 days after the date of filing the written request for mediation, whichever occurs first. The mediation may continue after the commencement of arbitration if the affected Parties so desire. Unless otherwise agreed by the affected Parties, the mediator shall be disqualified from serving as arbitrator in the case. The provisions of this

Section may be enforced by any Court of competent jurisdiction, and the Party seeking such enforcement shall be entitled to an award of all costs, fees and expenses, including attorneys' fees, to be paid by the Party against whom such enforcement is ordered.

B. **Arbitration**. Any dispute, claim or controversy arising under this Agreement, whether for breach, enforcement, or interpretation thereof, including the determination of the scope or applicability of this Agreement to arbitrate, which could not be resolved through the mediation process set forth above, may be submitted to non-binding arbitration and, with the agreement of both Parties, shall be determined by binding arbitration, before a sole arbitrator, in accordance with the laws of the State of California for agreements made in and to be performed in that State. Judgment on the binding arbitration award, if any, may be entered in any court having jurisdiction. The arbitrator may allocate all of the costs of the arbitration, including the fees of the arbitrator and the reasonable attorneys' fees of the prevailing Party, against the Party who did not prevail.

C. **Selection of Mediator/Arbitrator**. The Parties shall first attempt to mutually agree to a mediator or arbitrator. If the Parties fail to agree on the mediator or arbitrator, the Parties shall each nominate and exchange with each other the names of three persons to resolve the dispute. From this group of nominated mediators or arbitrators, the Parties shall select the Mediator or Arbitrator. If each of the Parties selects the same Mediator or Arbitrator, that person shall be the Mediator or Arbitrator. In the event two or more same persons are selected by the Parties, the person whose name precedes the other alphabetically shall be the Mediator or Arbitrator. If the Parties do not select the same person as the other Party, then each Party shall eliminate two of the other's selection and the remaining names shall be randomly drawn in order by either Party. The first drawn shall be the Mediator or Arbitrator unless there is a conflict of interest or the mediator or arbitrator cannot serve because of scheduling conflicts. In that case, the second name drawn shall be the Mediator or Arbitrator. No Mediator or Arbitrator shall be nominated or selected if they have any actual or perceived conflict of interest. If necessary, this process can be repeated to nominate or select a mediator or arbitrator if the final two selected Mediators or Arbitrators have any actual or perceived conflict of interest.

8. **Liability Regarding Distribution of BV Sale Water.**

A. HYDROGEN ENERGY and its officers, agents, or employees shall not be liable for the control, carriage, handling, use, disposal, or distribution of BV Sale Water upstream of any Point of Delivery, nor for any claim of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal or distribution of such water, unless such damages or claims are a result of intentional or reckless misconduct on the part of HYDROGEN ENERGY. BV shall indemnify and hold harmless HYDROGEN ENERGY, its

officers, agents, and employees from any such damages or claims of damages as set out in Section 9 of this Agreement.

B. BV and its officers, agents, and employees shall not be liable for the control, carriage, handling, use, disposal, or distribution of BV Sale Water downstream of any Point of Delivery; nor for any claim of damage of any nature whatsoever, including, but not limited to, property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water, unless such damages or claims are a result of intentional or reckless misconduct on the part of BV. HYDROGEN ENERGY shall indemnify and hold harmless BV its officers, agents, and employees from any such damages or claims of damages as set out in Section 9 of this Agreement.

9. **Indemnity and Hold Harmless.**

A. **BV Indemnity.** BV shall at all times indemnify, defend and save HYDROGEN ENERGY, its Board of Directors, officers, representatives, consultants, contractors, agents and employees free and harmless from, and pay in full, any and all claims, demands, losses, damages or expenses, including reasonable attorney fees and costs that HYDROGEN ENERGY, its Board of Directors, officers, representatives, consultants, contractors, agents and/or employees may sustain or incur in any manner relating to, arising out of or connected with BV's non-performance of the terms of this Agreement, excepting any loss, damage or expense and claims for loss, damage or expense resulting in any manner from the negligent or unlawful act or acts of HYDROGEN ENERGY, its Board of Directors, officers, representatives, consultants, contractors, agents or employees.

B. **HYDROGEN ENERGY Indemnity.** HYDROGEN ENERGY shall at all times indemnify, defend and save BV, its Board of Directors, officers, representatives, consultants, contractors, agents and employees free and harmless from, and pay in full, any and all claims, demands, losses, damages, or expenses, including reasonable attorneys' fees and costs that BV, its Board of Directors, officers, representatives, consultants, contractors, agents and/or employees may sustain or incur in any manner relating to, arising out of or connected with HYDROGEN non-performance of the terms of this Agreement, excepting any loss, damage or expense and claims for loss, damage or expense resulting in any manner from the negligent or unlawful act or acts of BV, its Board of Directors, officers, representatives, consultants, contractors, agents, or employees. It is specifically understood that BV will use its best efforts to meet CEQA requirements regarding the BV Brackish Groundwater Remediation Project and the sale of BV Sale Water to HYDROGEN ENERGY and that HYDROGEN ENERGY shall pay all costs (including BV's reasonable CEQA related litigation costs, if any) associated with such process.

10. **Notices and Wire Transfers.** All written notices required to be given pursuant to the

terms hereof shall be either (i) personally delivered, (ii) deposited in the United States express mail or first class mail, registered or certified, return receipt requested, postage prepaid, (iii) delivered by overnight courier service, or (iv) delivered by facsimile transmission, provided that the original of such notice is sent by certified United States mail, postage prepaid, no later than one (1) business day following such facsimile transmission. All such notices shall be deemed delivered upon actual receipt (or upon first attempt at delivery pursuant to the methods specified in clauses (i), (ii) or (iii) above if the intended recipient refuses to accept delivery). Wire transfers shall be effective on proper transmission by HYDROGEN ENERGY's transmitting agent. All such notices and wire transfers shall be delivered or wired to the following addresses or to such other address as the receiving Party may from time to time specify by written notice to the other Party:

To HYDROGEN ENERGY:	To BV:
Hydrogen Energy LLC One World Trade Center Suite 1600 Long Beach, CA 90831 - 1601 Attn: Jonathon Briggs, Regional Director Telephone: 562-276-1543 Facsimile: 562-276-1571 Email: jonathan.briggs@hydrogenenergy.com	Wire Transfers: Payment shall consist of a wire transfer to BV at Wells Fargo Bank, with specific account information to be provided. Buena Vista Water Storage District P. O. Box 756 Buttonwillow, CA 93206 Attn: Dan W. Bartel, Engineer Manager Telephone: 661-324-1101 Facsimile: 661-764-5053 Email: dbartel@bvh2o.com

11. **Counterparts**. This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which, taken together, shall constitute one and the same instrument. Signatures sent by facsimile shall be deemed originals and treated in all respects as originals. As may be necessary for any alternative dispute resolution required or permitted under this Agreement, a copy of this Agreement shall be deemed to be an original for the purposes of satisfying the California and/or Federal Rules of Evidence.

12. **Authority**. In signing below, each of the Parties represents and warrants to each of the other Parties that each is a duly organized or constituted entity, with all requisite power to carry out its obligations under this Agreement, and that the execution, delivery and performance of this Agreement have been duly authorized by all necessary action of the board of directors or other governing body of such Party, and shall not result in a violation of such Party's organizational documents.

13. **Governing Law**. This Agreement shall be construed and enforced in accordance with the laws of the State of California.

14. **Agreement**. No amendment of this Agreement shall be binding upon the Parties unless it is in writing and executed by all of the Parties.

15. **Further Action**. The Parties agree to and shall take such further action and execute and deliver such additional documents as may be reasonably required to effectuate the terms and conditions of this Agreement and to the extent consistent with the terms hereof.

16. **Assignment**. Except as provided below, neither Party shall assign, delegate, or otherwise transfer any of its rights or obligations under this Agreement without the prior written consent of the other Party, which consent shall not be unreasonably conditioned, withheld, or delayed.

A. HYDROGEN ENERGY may, without the consent of BV, assign this Agreement:

(i) to any person or entity that acquires all or substantially all of the assets of the HYDROGEN ENERGY Project;

(ii) to any entity or entities that directly or indirectly control, or are directly or indirectly controlled by or under common control with, HYDROGEN ENERGY; or

(iii) in connection with a merger of HYDROGEN ENERGY with another entity or any other transaction resulting in a change of control of the HYDROGEN ENERGY;

provided that the assignee, delegate or transferee or the entity surviving such merger, as applicable, agrees in a writing reasonably acceptable to BV, to be bound by the terms of this Agreement, and in BV's reasonable opinion is capable of abiding by all of the terms and condition contained within this Agreement;

B. HYDROGEN ENERGY, without the consent of BV, may grant a security interest in its interest under this Agreement to any of its lenders (an "HE Lender") as security for any loan or other obligation made for the purpose of financing or refinancing the construction and/or operation of the HYDROGEN ENERGY Project. Promptly after granting such security interest, HYDROGEN ENERGY shall notify BV in writing of the name, address, and telephone and facsimile numbers of each HE Lender to which HYDROGEN ENERGY's interest under this Agreement has been encumbered.

C. If HYDROGEN ENERGY encumbers its interest under this Agreement as permitted by this the preceding clause B. the following provisions shall apply:

(i) The HE Lender shall have the right, but not the obligation, to perform any act required to be performed by HYDROGEN ENERGY under this Agreement to prevent or cure a default by HYDROGEN ENERGY, and such act performed by the HE Lender shall be as effective to prevent or cure a default as if done by HYDROGEN ENERGY.

(ii) Upon the receipt of a written request from HYDROGEN ENERGY or any HE Lender, BV shall execute or arrange for the delivery of such certificates, consents, opinions, and other documents as may be reasonably necessary for HYDROGEN ENERGY to consummate any financing or refinancing of the HYDROGEN ENERGY Project or any part thereof and will enter into reasonable agreements with such HE Lender that provide that BV will recognize the rights of such HE Lender upon foreclosure of HE Lender's security interest and such other provisions as may be reasonably requested by any such HE Lender, so long as any such certificates, consents, opinion, and other documents do not in materially modify the terms of the Agreement between HYDROGEN ENERGY and BV.

(iii) BV acknowledges that upon an event of default by HYDROGEN ENERGY under any financing documents relating to the HYDROGEN ENERGY Project, any HE Lender may (but shall not be obligated to) assume, or cause its designee or a new lessee or purchaser of the HYDROGEN ENERGY Project to assume, all of the interests, rights, and obligations of HYDROGEN ENERGY thereafter arising under this Agreement. Notwithstanding any such assumption, HYDROGEN ENERGY shall not be released and discharged from and shall remain liable for any and all obligations to BV arising or accruing hereunder.

The provisions of this Section 16.C are for the benefit of any and all HE Lenders as well as the parties to this Agreement and shall be enforceable by any HE Lender as an express third-party beneficiary hereof. BV agrees that no HE Lender shall be obligated to perform any obligation or be deemed to incur any liability or obligation provided in this Agreement on the part of HYDROGEN ENERGY or shall have any obligation or liability to BV with respect to this Agreement except to the extent any HE Lender has assumed the obligations of HYDROGEN ENERGY hereunder pursuant to this Section 16.C.

D. Notwithstanding any of the foregoing provisions contained in this Section 16, BV shall not be obligated to acknowledge or assent to any assignment, delegation, or transfer to any third party in the event BV reasonably determines that such third party does not, or will not, or does not have the financial capability to, perform all of HYDROGEN ENERGY's obligations under this Agreement.

17. **Water Acquisition by Hydrogen Energy**. HYDROGEN ENERGY shall primarily use water acquired from BV at the HYDROGEN ENERGY Project, except in the event of an occurrence of an insufficient supply as considered in Section 4 L, above, or in Section 19 below. HYDROGEN ENERGY and BV may also enter into a separate agreement regarding water usage on other property owned or controlled by HYDROGEN ENERGY.

18. **Excess Treated Water**. In the event HYDROGEN ENERGY purchases and treats more water than is necessary for use at the HYDROGEN ENERGY Project and elects to sell or transfer such excess to a third party, no such sale or transfer shall take place until the Parties enter into and successfully complete negotiations for a separate agreement for such sale or transfer, pursuant to which BV may be entitled to an agreed upon payment proportionately related to the profits from any such sale or transfer; provided, however, that BV may not unreasonably withhold its approval of such sale or transfer.

19. **Force Majeure; Change in Law**. The respective obligations of each Party hereto shall be suspended while it is prevented from complying by acts of God; war; riots; civil insurrection; acts of civil or military authority; fires; floods; earthquakes; labor accidents or incidents; rules and regulations of any federal, state, or other governmental agency; changes in law, rules, or regulations of any federal, state or other governmental agency; or other cause of the same or other character any of which are beyond the reasonable control of such Party (collectively, "Force Majeure"). In the event of a suspension due to the foregoing, the Party whose obligations are suspended shall promptly notify the other Party in writing of such suspension and the cause and estimated duration of such suspension.

    The Party providing such notice shall be excused from fulfilling its obligations under this Agreement until such time as the Force Majeure has ceased to prevent performance or other remedial action is taken, at which time the Party shall promptly notify the other Party of the resumption of its obligations under this Agreement. Any Party rendered unable to fulfill any of its obligations by reason of a Force Majeure shall exercise due diligence to remove such inability with reasonable dispatch within a reasonable time period and mitigate the effects of the Force Majeure. The relief from performance shall be of no greater scope and of no longer duration than is required by the Force Majeure.

20. **Joint Drafting and Negotiation**. This Agreement has been jointly negotiated and drafted. The language of this Agreement shall be construed as a whole according to its fair meaning and without regard to or aid of Civil Code Section 1654 or similar judicial rules of construction. Each Party acknowledges that it has had the opportunity to seek the advice of experts and legal counsel prior to executing this Agreement and that it is fully aware of and understands all of its terms and the legal consequences thereof.

21. **Headings**. Headings used in this Agreement are for reference only and shall not affect the construction of this Agreement.

22. **No Third Party Beneficiaries**. Except as provided in Section 16, no third party shall be entitled to claim or enforce any rights under this Agreement.

23. **Severability**. In the event that any provision of this Agreement is determined by a court to be invalid, the court shall reform the provision in a manner that is both

consistent with the terms of this Agreement taken as a whole and legally valid. The remainder of this Agreement shall not be affected thereby.

24. **Successors and Permitted Assigns**. All covenants and agreements contained in this Agreement by or on behalf of any of the Parties shall bind and inure to the benefit of their respective successors and permitted assigns under Article 16, whether so expressed or not.

IN WITNESS WHEREOF, each Party has executed this Agreement on the date set forth below, said Agreement to be effective on the Effective Date stated above.

Date: 11/20/09

HYDROGEN ENERGY CALIFORNIA LLC

By: _____

Title: PRESIDENT

Date: _____

By: BUENA VISTA WATER STORAGE DISTRICT

By: _____

Title: Board President

APPROVED AS TO FORM.

McMURTREY, HARTSOCK and WORTH

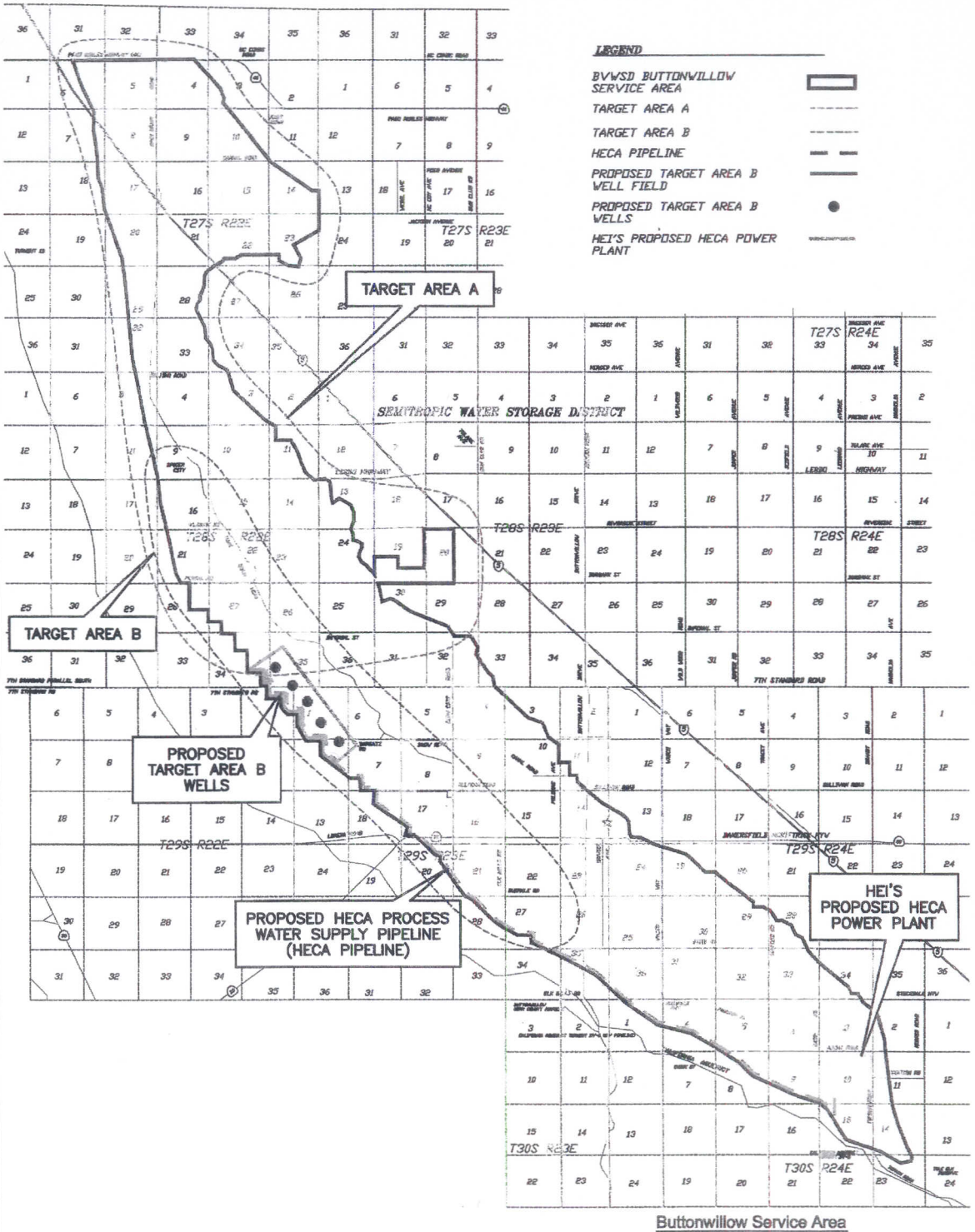
By: _____
ROBERT W. HARTSOCK
Attorneys for Buena Vista Water Storage District

APPROVED
LEGAL
MW

EXHIBIT "A"

FACILTY MAP

Exhibit "A"



Buttonwillow Service Area

NOTE:
BASE MAP PROVIDED BY BUENA VISTA WATER STORAGE DISTRICT.

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

578-8F10.DWG

KRIEGER & STEWART INCORPORATED
3602 University Ave. • Riverside, CA. 92501 • 951-684-6900

BUENA VISTA WATER STORAGE DISTRICT

BUENA VISTA WATER MANAGEMENT PROGRAM

BRACKISH GROUNDWATER REMEDIATION PROJECT

FIGURE 10 OF 10

SCALE: 1"=10,000' DATE: 09/25/09 DRAWN BY: JGS CHECKED BY: VEM W.O.: 578-8.2

EXHIBIT "B"

BRACKISH GROUNDWATER REMEDIATION PROJECT DESCRIPTION

Component 4: Brackish Groundwater Remediation Project (BGRP)

Certain areas in the northern portion of the Buttonwillow Service Area overlie aquifers characterized by TDS concentrations exceeding the California Department of Public Health (CDPH) secondary maximum contaminant level (MCL) of 1,000 mg/l. TDS concentrations in these northern areas (generally north of 7th Standard Road) typically range from 1,000 to 4,000 mg/l. The southern portion of the Buttonwillow Service Area has lower TDS concentrations ranging from 300 to 1,000 mg/l, as shown in Figure 6. A shallow perched groundwater zone within the northern area contains TDS concentrations typically ranging from 1,000 to 5,000 mg/l, as shown in Figure 7.

The BGRP is designed to remediate brackish groundwater conditions and shallow, perched groundwater conditions within the Buttonwillow Service Area by recovering brackish groundwater and shallow brackish perched groundwater from strategic locations within the aquifer. As described in II(B)(4) herein, shallow perched groundwater conditions and elevated TDS concentrations have adversely impacted plant growth and crop yields in affected areas of the District.

While some crops are more salt-tolerant than others, all crops suffer and yields decline as groundwater TDS concentrations increase. Growers on lands overlying higher-TDS groundwater have fewer choices of viable crops, and achieve lower yields on those crops, than growers on lands overlying lower-TDS groundwater (Crewdson 2009).

The BGRP consists of constructing and operating strategically-located shallow- and medium-depth brackish groundwater recovery wells and collection and conveyance pipelines that will recover and transport brackish groundwater to participants at receiving facilities located either inside or outside District boundaries.

The District has identified two types of brackish groundwater problems and has designated two corresponding target areas for remediation, termed Target Area A and Target Area B, which are depicted in Figure 10 and are described in additional detail below. The BGRP includes extraction of up to 12,000 AF/yr of brackish groundwater from Target Area A, Target Area B, or a combination of these areas.

Placing the brackish water back into the ground nearby would not result in a benefit. The initial extent of the BGRP depends upon the rate and volume of brackish water that the District can continually dispose of by delivery to one or more brackish water users. Therefore, implementation of the BGRP in Target Area

A and in Target Area B will each include extraction of brackish groundwater, which the District will transport and deliver to one or more brackish water users who are ready, willing, and able to participate in the BGRP. Potential environmental impacts associated with the construction and operation of participating users' receiving facilities are beyond the scope of this document and will be addressed by the user receiving such brackish water, or by the lead agency for the user's CEQA process.

Potential BGRP participating users have not yet been identified, with the exception of Hydrogen Energy International LLC (HEI), which is contemplating participating in the BGRP as a user to receive brackish groundwater at a future power plant. Potential facilities that would be constructed and operated to serve HEI, should it become a participating user, are described in additional detail in *Target Area B* below.

Target Area A

Target Area A is located throughout the northern portion of the Buttonwillow Service Area generally north of 7th Standard Road, as depicted in Figure 10. A shallow brackish perched groundwater aquifer exists throughout most of this area, typically standing at depths of two to ten feet below ground surface (see Figure 5) and having TDS concentrations ranging from 1,000 to 5,000 mg/l (see Figure 7).

The intent of the BGRP in Target Area A is to improve these lands for agricultural use by physically lowering the level of the shallow brackish perched groundwater aquifer by aquifer dewatering. An additional benefit of this is the possible improvement in groundwater quality in Target Area A.

Implementation of the BGRP in Target Area A includes construction and operation of up to 40 very shallow, low-flow brackish groundwater extraction wells (Target Area A wells) in a grid-array orientation designed to uniformly lower the widespread shallow, perched groundwater. The District has previously experimented with drainage systems to lower the perched groundwater, and with positive results; therefore, the District is aware that a physical lowering of the shallow perched groundwater level is sufficient for improving the growing conditions in the type of problem area typical of Target Area A (Crewdson 2009). Proposed Target Area A wells will additionally include associated transmission and conveyance pipelines, appurtenances, and access features. At this time, potential participants in the BGRP for Target Area A have not yet been identified.

Target Area B

Exhibit "B"

Target Area B is located in lands within the Buttonwillow Service Area that overlie deeper aquifer zones that contain brackish groundwater that occurs in the general depth interval from 200 to 700 feet or more below ground surface. Depth to groundwater in Target Area B, the location of which is depicted in Figure 10, ranges from approximately 20 to 80 feet below ground surface (Crewdson 2009).

Groundwater TDS concentrations in this area broadly range from 700 to 4,000 mg/l, but localized areas and zones containing elevated TDS concentrations in the range of 2,000 to 4,000 mg/l occur along the western District boundary. Target Area B lands overlie part of the larger aquifer system which receives lateral (horizontal) recharge waters from two different sources. Lower-TDS water recharges the aquifer from the east, higher-TDS water recharges the aquifer from the west, and different areas within the Buttonwillow Service Area overlie different types of water (Crewdson 2009).

After decades of irrigation pumping, the District has determined that it is not possible to remove the higher-TDS water from the aquifer simply by extraction in Target Area B, because lateral recharge from the west brings in the brackish groundwater faster than it can be removed. Additionally, existing wells within the District are not specifically situated so as to achieve any such deliberate, permanent extraction. Therefore, the brackish groundwater must be extracted from strategic locations to reduce lateral recharge from the west (Crewdson 2009).

To remediate brackish groundwater conditions in Target Area B, the District intends to construct and operate up to ten brackish groundwater extraction wells in Target Area B. The initial phase of the BGRP includes five proposed Target Area B wells that are preliminarily situated in a linear formation along the approximate center of the western boundary of the Buttonwillow Service Area, in Sections 34 and 35, Township 28 South, Range 22 East and Sections 1, 2, and 12, Township 29 South, Range 22 East MDM.

These five wells, as shown in Figure 10, have been preliminarily sited in such a manner to intercept the inflow of brackish groundwater from the west, creating a "salt-shadow" to the east of the wells. The conceptual design includes a northwesterly trending line of five wells (three operational and two redundant), each spaced at intervals of approximately one-quarter mile and drilled to depths of approximately 300 to 400 feet below ground surface. This configuration is intended to result in a zone of blending to the east of these five Target Area B wells in which the lower-TDS water from the east will have a greater impact on the overall TDS concentration within that zone than the higher-TDS water from the west (Crewdson 2009). The final locations, spacing, and depths of said wells will be determined during well field design, installation, and testing.

The initial zone of benefit for Target Area B is projected to be located directly east of the five proposed initial Target Area B wells (preliminary locations of which are shown on Figure 10), and its beneficial impact will grow slowly over time. The rate of increase and ultimate size of the zone of benefit will depend on the long-term extraction rate, aquifer properties, and locations of additional Target Area B wells (Crewdson 2009).

The BGRP in Target Area B includes constructing and operating the following facilities:

- Ten Target Area B wells, five of which are preliminarily located as shown on Figure 10, with the remaining five wells to be constructed as needed to obtain the full capacity of the BGRP;
- Brackish groundwater conveyance pipeline(s), and
- Associated structures, appurtenances, and access features.

The scope of the initial phase of the BGRP will be determined by the rate and volume of brackish water that the District can continually dispose of by delivery to an initial, long-term consumer of the brackish water. The ultimate number (up to ten) of Target Area B wells will depend upon the following three factors:

1. The locations, depths, and flow rates that would create the greatest benefit to the aquifer TDS concentrations;

2. The volume of recovered water that the District can dispose of by conveyance to brackish water consumers; and

3. The cost of constructing and operating BGRP facilities in Target Area B.

The District estimates that three to eight wells will be sufficient for optimizing the BGRP in Target Area B. The locations and extent of the brackish groundwater conveyance pipeline(s) depend upon the locations of the receiving facilities.

One potential participant in the BGRP for Target Area B is Hydrogen Energy International LLC (HEI), who is considering participating in the BGRP as a brackish water user. If HEI participates, it may receive up to 7,500 AF/yr of brackish groundwater from the District for use as process water at its proposed Hydrogen Energy California power plant facility (HECA power plant), as set forth in its Revised Application for Certification for Hydrogen Energy California, Kern County, California (Volumes I and II), prepared by URS and submitted to the California Energy Commission (CEC) on May 28, 2009. This document is hereinafter referred to as the HECA AFC, and is available to the public on the CEC website at www.energy.ca.gov/sitingcases/hydrogen_energy/ index.html.

The HECA power plant is currently in the planning stages and is preliminarily located in Section 10, Township 30 South, Range 24 East, MDM, in the southerly portion of the Buttonwillow Service Area as shown on Figure 10. The HECA power plant project is subject to separate environmental review and approval by the California Energy Commission (CEC). CEC is lead agency pursuant to CEQA for the HECA power plant project and will prepare and adopt appropriate CEQA-equivalent documents for the HECA power plant project. Therefore, Target Area B wells, pipelines, appurtenances, and access features that would serve the HECA power plant, if HEI participates in the BGRP, would be subject to any mitigation measures required by CEC in addition to those set forth in this EIR. Said Target Area B facilities, once constructed by either HEI, BVWSD, or both, would be owned and operated by BVWSD.

In the event that HEI becomes a participant in the Program, the initial five proposed Target Area B wells will serve the HECA power plant, and a brackish water conveyance pipeline (HECA pipeline) will be included in the BGRP in order to convey brackish groundwater from the Target Area B wells to the HECA power plant. The initial five Target Area B wells and the HECA pipeline are shown on Figure 10 herein.

The HECA pipeline is anticipated to consist of a belowground pipeline, approximately twenty inches in diameter and approximately fifteen miles in length, extending from the initial five proposed Target Area B wells to the HECA power plant. The HECA pipeline would be installed predominately within the District's unpaved service road that is located along the eastern bank of the West Side Canal, and would traverse the following sections:

- Sections 27, 28, and 34, Township 28 South, Range 22 East;
- Sections 1, 2, and 12, Township 29 South, Range 22 East;
- Sections 7, 17, 18, 20, 21, 27, 28, 34, 35, and 36, Township 29 South, Range 23 East;
- Section 1, Township 30 South, Range 23 East; and
- Sections 5, 6, 8, 9, 10, and 15, Township 30 South, Range 24 East.

BGRP facilities described herein, with the exception of the HECA pipeline, will be constructed whether or not HEI becomes a participant in the BGRP. Environmental impacts resulting from implementation of the BGRP will be assessed and mitigated as set forth herein. Environmental impacts resulting from construction and operation of facilities intended to serve the HECA power plant will be mitigated as set forth herein and will also be subject to CEC's environmental review process and any additional mitigation measures required by CEC, as lead agency pursuant to CEQA for the HECA power plant.

Annual brackish groundwater recovery anticipated by the BGRP could be up to 12,000 AF/yr, of which approximately 7,500 AF/yr may be conveyed to the HECA power plant in the event that HEI participates in the BGRP. Remaining quantities may be extracted from either Target Area A or Target Area B using wells constructed pursuant to the BGRP, existing District wells, existing landowner wells, tile drainage systems through individual volunteer landowner agreements, or other methods designed to extract, convey, and dispose of brackish groundwater that may be developed during the environmental review and planning process. The District will manage resultant supplies through programs with in-District entities, out-of-District entities, or a combination of these.

February 14, 2012

Hydrogen Energy California LLC
Attn: Mark Lerdal
30 Monument Square, Suite 235
Concord, MA 01742

RE: Water Service to Hydrogen Energy California
Taft Area

Dear Mr. Lerdal:

This letter will confirm that West Kern Water District is in compliance with all Federal and State Drinking Water Standards and has the capacity to provide water service during the construction and operation to your proposed development. Standard District connection fees will be required prior to service and owner may be required to provide transmission/distribution improvements should District facilities prove inadequate.

If you should have any questions or require additional information please do not hesitate to contact me.

Sincerely,

J.D. Bramlet
Director of Operations

JDB:war

Appendix N-2

Groundwater Modeling Documentation

APPENDIX O2
GROUNDWATER MODEL DOCUMENTATION

HECA Project Site

Buena Vista Water Storage District

Kern County, California

Prepared for

Hydrogen Energy International LLC
One World Trade Center
Suite 1600
Long Beach, CA 90831

April 30, 2009

URS

George Muehleck, P.G.
Jim Zhang, Ph.D., P.E.
Liz Elliott, P.G.

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Hydrogen Energy International LLC (HEI or Applicant) is jointly owned by BP Alternative Energy North America Inc. and Rio Tinto Hydrogen Energy LLC. HEI is proposing to build an Integrated Gasification Combined-Cycle power generating facility called Hydrogen Energy California (HECA or the Project) in Kern County, California. The Project will produce low-carbon baseload electricity by capturing carbon dioxide (CO_2) and transporting it for CO_2 enhanced oil recovery (EOR) and sequestration (storage)[1].

The Project will use impaired-quality groundwater provided by the Buena Vista Water Storage District (BVWSD) as the source of process water. A three-dimensional groundwater flow model was constructed to evaluate the effects of pumping groundwater for the proposed Project from a proposed well field within the BVWSD Buttonwillow Service Area in Kern County, California (Figure 1). The groundwater flow model was developed to evaluate the potential net impacts of project-specific pumping on the underlying and adjacent aquifer system. This aquifer system has been locally termed as the Buttonwillow Subbasin (KCWA 1991), which is located within the regional Kern County Subbasin. This model is a "superposition model," in which all non–project-specific hydrologic features were excluded, based on the application of the "principle of superposition" (Reilly, et al. 1987). MODFLOW, a groundwater modeling program developed by the U.S. Geological Survey (USGS), was used for model development and simulations.

The primary objective of this superposition model is to evaluate the net effects of project-specific pumping by:

1. Simulating net changes of groundwater flow conditions and aquifer response to project-specific pumping;

2. Providing sufficiently fine grid spacing to simulate groundwater pumping via extraction wells; and

3. Evaluating the sensitivity of groundwater flow in the aquifer to aquifer property assumptions.

[1] This carbon dioxide will be compressed and transported via pipeline to the custody transfer point at the adjacent Elk Hills Field, where it will be injected. The CO_2 EOR process involves the injection and reinjection of carbon dioxide to reduce the viscosity and enhance other properties of the trapped oil, thus allowing it to flow through the reservoir and improve extraction. During the process, the injected carbon dioxide becomes sequestered in a secure geologic formation. This process is referred to herein as CO_2 EOR and Sequestration.

This section discusses the Project's process water supply and the hydrologic setting of the proposed well field.

2.1 PROPOSED WATER SUPPLY

BVWSD will supply the proposed project with impaired-quality groundwater (average total dissolved solids [TDS] approximately equal to 2,000 milligrams per liter [mg/L]) for hydrogen generation, power-plant cooling, gasification, and other industrial processes. The groundwater will be supplied by a proposed well field to be constructed and operated by BVWSD. The proposed well field will intercept groundwater (i.e., first water [30 feet below ground surface (bgs)] to 300+ feet bgs) on the western side of the BVWSD.

As shown on Figure 1, the proposed Project well field is a northwest-oriented rectangular area located on the western side of the BVWSD Buttonwillow Service Area near Seventh Standard Road and the California Aqueduct. It includes portions of Sections 34 and 35 of Township 28S, Range 22E, and portions of Sections 1, 2, and 12 of Township 29S, Range 22E. The water pumped from the well field will be piped approximately 15 miles southeast to the project site.

BVWSD will provide the Project with up to approximately 7,500 acre-feet of groundwater each year. Although the water supply system is anticipated to provide environmental benefits and will not include use of fresh water, the California Energy Commission (CEC) requires evaluation of the potential environmental impacts associated with development of this water supply. Therefore, this groundwater flow model was constructed to evaluate the net effects of project groundwater pumping, and to support the analysis presented in the Project's Revised Application for Certification (AFC).

2.2 HYDROGEOLOGIC SETTING

The proposed well field is located in the Kern County Subbasin (DWR subbasin no. 5-22.14) of the San Joaquin Valley groundwater basin. The southern San Joaquin Valley, of which the Kern County Subbasin is a part, has been further divided into additional hydrogeologic subbasins that are bounded by distinct structural highs due to folding or faulting (KCWA 1991). These subbasins may contain isolated or partially isolated hydrogeologic systems. BVWSD's Buttonwillow Service Area is located in what is locally known as the Buttonwillow Subbasin, which is separated from the Jerry Slough Subbasin to the west, the Tulare Subbasin to the north, and by structural highs to the west.

Although there are many agricultural pumping wells within the region, not much geologic or hydrogeologic data have been collected in the vicinity of the proposed well field. As such, regional and local geologic and hydrogeologic reports from other studies in Kern County, as well as information provided by the BVWSD and their hydrogeologic consultant, Sierra Scientific Services, were used as a basis to develop this groundwater flow model. The region is underlain by unconsolidated sediments originating from an alluvial depositional setting with discontinuous lacustrine clay lenses. Alluvial deposits, by nature, are heterogeneous assemblages of both coarse- and fine-grained material. Based on available geophysical logs, the stratigraphy is

dominated by interbedded sands and gravels with minor vertically and laterally discontinuous silt and clay layers.

The aquifer system is both unconfined, and most likely, semi-confined in places. Based on a 2008 depth to water map provided by BVWSD, depth to groundwater in the vicinity of the proposed well field is approximately 30 feet bgs.

This section briefly describes model computer codes used to build the model.

3.1 GROUNDWATER MODELING SYSTEM INTERFACE

The computer software program chosen as the graphical interface for the modeling effort was the U.S. Department of Defense Groundwater Modeling System (GMS), version 6.0. GMS is a comprehensive graphical user interface (GUI) for performing groundwater simulations. GMS provides a graphical preprocessor and postprocessor interface to several groundwater modeling codes: MODFLOW, MODPATH, MT3DMS, RT3D, FEMWATER, SEEP2D, NUFT, and UTCHEM. The GMS interface was developed by the Environmental Modeling Research Laboratory of Brigham Young University in partnership with the U.S. Army Engineering Waterways Experiment Station. GMS was used to develop a simplified site conceptual hydrogeological model, and to convert it into a groundwater flow model.

3.2 MODFLOW GROUNDWATER FLOW MODEL

The computer code selected to model groundwater conditions was MODFLOW. MODFLOW is a three-dimensional, cell-centered, finite difference, saturated flow model developed by the USGS (McDonald and Harbaugh 1988). GMS provides an interface to the updated version, MODFLOW 2000 (Hill et al. 2000). Based on the information available, the uncertainty associated with site information, and the modeling objectives of evaluating the potential net effects of project-specific pumping, MODFLOW was considered an appropriate groundwater flow code.

3.3 MODPATH PARTICLE TRACKING MODEL

Particle tracking simulations provide a convenient means of visualizing groundwater flow paths. This is particularly useful for evaluating capture zones around a pumping well. MODPATH was selected as the particle tracking program for this effort. MODPATH is a three-dimensional particle tracking program developed by the USGS (Pollock 1994) that enables reverse and forward tracking from sinks (wells) and sources, respectively. GMS has updated the interface for MODPATH to a seamless module that couples with MODFLOW 2000. MODFLOW results are used as input for MODPATH runs.

The data used to develop the groundwater flow model was primarily provided by BVWSD, on behalf of Sierra Scientific Services, during meetings and in the form of e-mails, published reports (Sierra Scientific Services 2003; Sierra Scientific Services 2004; Sierra Scientific Services 2007a; and Sierra Scientific Services 2007b), and reports in preparation (Sierra Scientific Services 2009a and Sierra Scientific Services 2009b).

4.1 MODEL DOMAIN AND GRID

To eliminate the boundary effects on the simulated groundwater conditions, a model domain of 100 by 100 miles was specified, with the well field at the center of the model domain. This exaggerated domain size was created to ensure that drawdown simulated by well-field pumping was only affected by aquifer properties (e.g., hydraulic conductivity and storativity) and not by water flowing into or out of the boundary.

Because the proposed wells are arranged linearly in a northwest-trending direction, the model domain is rotated 49 degrees from north to west so that the rows and columns of the discretized grid are perpendicular and parallel to the arranged well line. This oriented model domain allows the proposed wells to be in the same column so that the simulation results are more easily processed.

The model domain has three layers extending from ground surface to 2,000 feet bgs. The model layers extend from 0 (ground surface) to 300 feet bgs (shallow zone), 300 to 600 feet bgs (deep zone), and 600 to 2,000 feet bgs (deeper zone).

The model grid contains 243,789 cells, spatially discretized into 247 columns and 329 rows in the plan view, as shown in Figure 2. The model grid is refined in the vicinity of the pumping wells. Lateral cell size of 20 by 20 feet was specified in the vicinity of the pumping wells, and the grid size increases towards the model domain boundaries. The maximum cell size, at the model boundary, is 2,500 by 2,500 feet.

4.2 HYDRAULIC CONDUCTIVITY

The lithology underlying the proposed well field area is characterized by heterogeneous unconsolidated deposits characteristic of an alluvial depositional system. Geophysical logs within and in the vicinity of the well field area indicate that the aquifer system is dominated by coarse-grained sediments with discontinuous interbedded fine-grained sediments. The 3-layer computer model is a simplification of the many-layered aquifer system in the well field area. As such, aquifer properties of the three model layers are assigned so that they will correctly simulate the behavior of the multi-layered aquifer system. Our basis for model parameterization is to make the Transmissivity (T) and storativity (S) values of the three model layers equivalent to the aggregate average T and S values of the same respective thicknesses of the actual aquifer system.

As demonstrated by Sierra Scientific Services, 2004 (p. 53), if the sand fraction (Fsd) in a total thickness interval (H) of the aquifer is at least 20 percent, and if the sand intervals are at least 100 times more permeable than the interbedded silty or clayey strata, then the T of the aquifer

equals T = Ksd*H*Fsd, where K is hydraulic conductivity and Ksd is the K of the sand units, without knowing the K values of the interbedded silts or clays. This condition may be implemented in the computer model by substituting a value of effective conductivity (K*) which is applicable to the entire interval thickness, H, where K* = Ksd*Fsd. This implementation will then yield the correct value of T for aquifer modeling. The same mathematical equivalence is applied to derive a value of equivalent storativity, (S*).

Based on a review of geophysical logs, the range of sand in the aquifer is approximately 60 to 90 percent. It is assumed that the horizontal K value of the sand is 57 feet per day (ft/day); horizontal K assumed to be uniform throughout the model domain. In the baseline simulation it was assumed that 75 percent of the aquifer thickness contained sand at a horizontal K value of 57 ft/day.

In alluvial aquifer systems of this type, vertical hydraulic conductivity is less than the horizontal hydraulic conductivity. The vertical anisotropic ratio, defined as the ratio of horizontal hydraulic conductivity to the vertical hydraulic conductivity, ranges from approximately 10 to 50 ft/day. With the assumption that horizontal conductivity is 57 ft/day, vertical conductivity is estimated to range from 1.1 ft/day to 5.7 ft/day. A mid-range anisotropic ratio value of 30 is used for the baseline simulation, which corresponds to a vertical conductivity value of 1.9 ft/day. The anisotropic ratio is assumed to be uniform throughout the model domain.

4.3 SPECIFIC YIELD AND SPECIFIC STORAGE

Local information provided by the BVWSD and their hydrogeologic consultant, Sierra Scientific Services, was reviewed to develop estimates for specific storage and specific yield. The specific yield of the local aquifer system was estimated to range from approximately 0.15 to 0.20. A mid-range value of 0.18 is used in the model for the baseline simulation.

The specific storage of the local aquifer system was estimated to range from approximately 0.00004 to 0.00007 (1/ft). A mid-range value of 0.0000551/ft is used in model for the baseline simulation.

4.4 PUMPING

The model simulates project-specific pumping from a proposed well field. The well field is assumed to include five wells arranged linearly in a northwest-trending direction and spaced approximately 0.25 mile apart (Figure 3). The model simulates a well field pumping rate of 7,500 acre-feet per year (afy), or 4,650 gallons per minute (gpm), which represents the upper-limit water demand for the proposed Project. Three of the five wells would be pumping at once, while the other two wells would be redundant. Therefore, the total pumping rate is divided evenly among the three pumping wells, resulting in a pumping rate of 1,550 gpm per pumping well. To be conservative, the model assumes that the three pumping wells are adjacent to one another in the center of the well field. The wells are placed in the uppermost model layer to simulate shallow pumping. The pumping rate is steady and continuous throughout the 25-year model simulation.

To evaluate the net effect of project-specific pumping, all other existing pumping wells are excluded from the model.

4.5 RECHARGE

From 1962 to 2000, the BVWSD's operations in its 50,000-acre Buttonwillow Service Area have resulted in a positive groundwater balance of approximately 46,000 afy. BVWSD projects that a positive groundwater balance of approximately 25,000 afy will be maintained in the future (BVWSD – personal communications January through May 2009). Therefore, even though the southern San Joaquin Valley has been classified by the DWR as an overdrafted groundwater basin, the BVWSD has historically been able to achieve a positive groundwater balance. Water levels in the BVWSD Buttonwillow Service Area have and are expected to continue to rise in response to BVWSD's recharge/replenishment operations.

Recharge within BVWSD is primarily attributable to infiltration from over-irrigation, as well as seepage loss from the BVWSD irrigation ditch and canal system. The model simulates recharge of 7,500 afy from BVWSD positive water balance operations that can be attributed to offset Project-specific pumping. The infiltration rate in the vicinity of the well field is approximately 0.4 ft/year. Therefore, recharge is applied to the model within an area around the pumping wells that is approximately 29.3 square miles (i.e., 18,750 acres), in order to yield a total recharge volume of 7,500 afy. According to the BVWSD, seepage loss from the irrigation ditch and canal system occurs for about two-and-a-half months during the irrigations months. Therefore, recharge is simulated 75 days per year.

4.6 INITIAL AND BOUNDARY CONDITIONS

Because the primary model objective is to evaluate the aquifer response to Project-specific pumping, the initial head distribution was specified as a constant head distribution. Based on data collected in 2008 and provided by BVWSD, average depth to water in the vicinity of the proposed well field is approximately 30 feet bgs; therefore, initial heads were specified as 30 feet bgs throughout the model domain.

Because the model domain (100 by 100 miles) far exceeds the area of influence of project pumping, the model boundary will not have an effect on groundwater conditions. Consequently, boundary conditions do not have an effect on the model so long as they are consistent with the initial condition. Therefore, a general head boundary condition with a constant reference head of 30 feet bgs was specified along the edges of the model domain for all three model layers.

4.7 TIMING OF MODEL STRESSES

The model simulated transient flow conditions for 25 years. Stress periods were set to 75 days and 290 days to allow simulation of annual recharge events. Well pumping is constant throughout the simulation.

The model was used to simulate groundwater pumping and response in one base case and eight sensitivity runs. The total pumping volume, number of pumping wells, pumping well locations and depth, recharge rate and area, boundary conditions, initial head, model timing, and stress period setup remained the same for all simulation runs. Sensitivity runs were conducted to test the effect of sand percentage (equivalent horizontal K values), vertical anisotropic ratio, specific yield, and specific storage on resulting simulated drawdown. Model parameters are summarized in Table 1, and simulation results are summarized in Table 2.

5.1 BASE CASE

Mid-range aquifer parameters were simulated under the base case. Based on an assumed total sediment thickness of 75 percent sand, the horizontal hydraulic conductivity was estimated to be 43 ft/day. The anisotropic ratio was defined as 30, resulting in a vertical hydraulic conductivity value of 1.9 ft/day. Specific yield and specific storage were defined as 0.18 and 5.5×10^{-5} 1/ft, respectively. In addition to simulating the net changes of groundwater flow conditions and aquifer response to project-specific pumping, particle tracking using MODPATH (Pollock 1994), a particle-tracking post-processing model for MODFLOW, was conducted to estimate the groundwater movement towards the well field induced by project pumping. Simulation results are presented in a hydrograph for hypothetical observation points (i.e., wells) at various distances from the pumping wells (Figure 4); a hydrograph for hypothetical observation points 0.5 mile to the east, west, north, and south of the pumping wells (Figure 5); contour maps (Figures 6, 7, and 8); groundwater table profiles (Figures 9 and 10); and a groundwater pathline map (Figure 11).

Simulation results show a decline in water level on the order of about 30 feet near the pumping wells during the first 3 years of pumping. Approximately 90 percent of the drawdown occurs during the first 3 years of pumping. After 3 years of pumping, the water-level decline stabilizes until maximum drawdown is reached after approximately 9 years of pumping. The water level remains relatively stable throughout the remainder of the 25-year simulation. The water level response is cyclic in nature due to the application of recharge for 75 days out of every year. Water levels vary between approximately 1 and 2 feet on an annual basis throughout the duration of the simulation.

Results show an asymmetric cone of depression due to the asymmetric application of recharge. The cone of depression extends further west of the pumping wells than it does to the east, north, or south, because the pumping wells are located near the western boundary of the recharge area, which is limited to BVWSD's Buttonwillow Service Area. After 25 years of pumping, the cone of depression extends approximately 1.4 miles from the pumping wells to the north, south, and east of the pumping wells, and approximately 2.5 miles to the west of the pumping wells. Slightly more drawdown is simulated perpendicular (to the east and west) than parallel (to the north and south) to the pumping wells due to the linear alignment of the three pumping wells.

Maximum simulated drawdown of approximately 37 feet occurs at the central pumping well. Drawdown decreases radially outward from the pumping wells such that maximum drawdown 200 feet east, 0.5 mile east, and 1 mile east of the pumping wells is 18.5, 5.2, and 2.0 feet,

respectively. Drawdown is slightly less to the north and south of the pumping wells at these same distances. Beyond 2 miles, drawdown is almost non-existent. Maximum drawdown 0.5 mile from the pumping wells was simulated to be at 5.2 feet to the east, 5.6 feet to the west, 3.9 feet to the north, and 3.9 feet to the south. Groundwater contour maps show that the cone of depression extends from the shallow zone (model layer 1), where the pumping wells are located, to the base of the model (model layer 3).

The hydrograph shows that a slight rise in water level occurs 2 miles north of the pumping wells due to the influence of recharge and lack of pumping well influence. Groundwater table profiles show that water level rises at a distance beyond the influence of the pumping wells to the north, south, and east of the pumping wells due to recharge.

Particle tracking results show that the maximum net movement of the groundwater induced by project pumping is approximately 0.8 mile towards the well field after 25 years of project pumping. Note that these derived groundwater pathlines exclude the effect of the natural groundwater gradient.

5.2 SENSITIVITY SIMULATIONS

Sensitivity simulations were conducted to test the sensitivity of the model results with respect to aquifer parameters for sand percentage, anisotropic ratio, specific yield, and storativity. Only one parameter was modified from the base case in each sensitivity run. Resulting hydrographs at an observation point located at the central pumping well, 200 feet east of the pumping wells, and 0.5 mile east of the pumping wells are presented on Figures 12, 13, and 14, respectively.

5.2.1 Sand Percentage

The model was used to simulate total sediment thickness at 60 and 90 percent sand, which corresponds to equivalent horizontal K values of 34 ft/day and 51 ft/day, respectively.

The drawdown response is similar to the base case in that the water level drop begins to flatten out after approximately 3 years of pumping. As in the base case, a cyclic water level response occurs due to the intermittent annual application of recharge. Maximum drawdown, which occurs at the central pumping well, is 47 feet with 60 percent sand, and 30.5 feet with 90 percent sand. This can be compared with the maximum base case drawdown of 37 feet, as summarized above.

As expected with a lower sand percentage (smaller equivalent horizontal K value), the cone of depression is deeper, yet aerially smaller, than with a higher sand percentage. The difference in drawdown between the lower-end and upper-end sand percentage simulations decreases with distance from the pumping wells. For example, at a distance of 1 mile from the pumping wells, drawdown is greater with a lower sand percentage (i.e., 2.4 feet of drawdown for 60 percent sand versus 1.7 feet of drawdown for 90 percent sand). At a distance of 0.5 mile from the pumping wells, drawdown would be 6.5 feet at 60 percent sand versus 4.4 feet of drawdown for 90 percent sand.

Overall, model results show that drawdown is sensitive to sand percentage.

5.2.2 Anisotropic Ratio

Anisotropic ratios of 10 and 50 were simulated, which correspond to vertical K values of 5.7 ft/day and 1.1 ft/day, respectively.

The behavior of the water level response is similar to the base case. Maximum drawdown at the central pumping well is approximately 32 feet with an anisotropic ratio of 10 and approximately 39 feet with an anisotropic ratio of 50. These results bracket the maximum drawdown in the base case (37 feet).

As the anisotropic ratio increases (the vertical hydraulic conductivity decreases), there is greater drawdown because less water flows from the deeper zones to the shallow zone of the model. For example, at a distance of one-half mile from the pumping wells, the model simulates maximum drawdown of 3.6 feet with an anisotropic ratio of 10, and 6.2 feet with an anisotropic ratio of 50. The cone of depression is larger as the anisotropic ratio increases, but the effect of variable anisotropy becomes increasingly muted at distance from the pumping wells.

Overall, model results show that drawdown is sensitive to the anisotropic ratio.

5.2.3 Specific Yield

A specific yield of 0.15 and 0.20 was simulated.

As with the previous sensitivity simulations, the behavior of the water level response is similar to the base case. The magnitude of the drawdown and the aerial extent of the cone of depression is very similar to the base case. The only difference from the base case is the timing at which the maximum drawdown occurs. When specific yield is lower, maximum drawdown is achieved quicker. As specific yield increases, the time at which maximum drawdown occurs increases because more water is released from storage.

Model results show that drawdown is insensitive to the change in specific yield. This is because the pumped groundwater is mainly from water transmission, due to the high K value, not from the storage change of the aquifer.

5.2.4 Specific Storage

Specific storage values of 4×10^{-5} 1/ft and 7×10^{-5} 1/ft were simulated. Results are very similar to both the base case and specific yield sensitivity simulations. Model results show that drawdown is relatively insensitive to the change in specific storage. This is also because the pumped groundwater is mainly from water transmission, not from the storage change of the aquifer.

Simulation results show that the net effect of project-specific pumping is a cone of depression that extends approximately 1.4 miles to the north, south, and east of the well field and approximately 2.5 miles to the west of the well field. Beyond those distances, drawdown is almost nonexistent, and to the north, south, and east, water levels rise slightly due to BVWSD's positive water balance recharge. Maximum drawdown one-half mile from the pumping wells was simulated to be 5.2 feet to the east, 5.6 feet to the west, 3.9 feet to the north, and 3.9 feet to the south. Accordingly, wells within 0.5 mile of the pumping wells exhibited greater drawdowns, and wells further than 0.5 mile of the pumping wells exhibited lower drawdowns until distances of approximately 1.4 miles to the north, south, and east and 2.5 miles to the west were reached, at which point drawdown would be almost nonexistent. In the base case, using mid-range values of sand percentage and anisotropic ratio, maximum drawdown at the central pumping well is approximately 37 feet, and only approximately 2 feet at a distance of 1 mile from the pumping wells.

Simulation results show that approximately 90 percent of the drawdown occurs during the first 2 to 3 years of pumping. After 2 to 3 years, drawdown gradually continues to increase until maximum drawdown is reached at approximately Year 9. After Year 9, water levels remain relatively stable throughout the remainder of the 25-year simulation. The water level response is cyclic in nature due to the application of recharge for 75 days out of every year. Water levels vary between approximately 1 and 2 feet on an annual basis throughout the duration of the simulation.

Simulation results show that the model is insensitive to the specific yield and specific storage of the aquifer, but sensitive to both horizontal and vertical K, as defined by the sand percentage and anisotropic ratio, respectively.

Particle tracking results show that the net movement of groundwater induced by Project pumping is approximately 0.8 mile towards the well field.

The model was developed to evaluate the potential impacts of pumping on water levels within the aquifer system under and adjacent to the BVWSD Buttonwillow Service Area (i.e., the Buttonwillow Subbasin). Any groundwater model, including this screening-type model, is a simplification of the natural environment and therefore has recognized limitations.

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TABLES

Model Parameter	Model Simulation								
	Base Case	Sensitivity Simulation							
		Sand %		Anisotropy		Specific Yield		Specific Storage	
		Lower End	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	Upper End
Pumping									
Total Rate (AFY)	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
Number of Pumping Wells	3	3	3	3	3	3	3	3	3
Rate per Well (AFY)	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Schedule	constant	constant	constant	constant	constant	constant	constant	constant	constant
Duration (years)	25	25	25	25	25	25	25	25	25
Recharge									
Total Rate (AFY)	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
Area (acre)	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750
Rate (ft/year)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Schedule (days/year)	75	75	75	75	75	75	75	75	75
Duration (years)	25	25	25	25	25	25	25	25	25
Hydraulic Conductivity (K)									
K sand (ft/day)	57	57	57	57	57	57	57	57	57
Sand percentage (%)	75	60	90	75	75	75	75	75	75
Horizontal K (ft/day)	42.8	34.2	51.3	42.8	42.8	42.8	42.8	42.8	42.8
Anisotropic ratio	30	30	30	10	50	30	30	30	30
Vertical K (ft/day)	1.9	1.9	1.9	5.7	1.1	1.9	1.9	1.9	1.9
Storage									
Specific Yield	0.18	0.18	0.18	0.18	0.18	0.15	0.20	0.18	0.18
Specific Storage	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	4.0E-05	7.0E-05
Simulation Time (years)	25	25	25	25	25	25	25	25	25

Notes:
1. Sensitivity simulations were conducted for the lower end and upper end of the estimated aquifer parameter range.
2. One parameter was modified in each sensitivity simulation (see highlighted parameter).

Table 1: Model Parameters

Results	Model Simulation								
	Base Case	Sensitivity Simulation							
		Sand %		Anisotropy		Specific Yield		Specific Storage	
		Lower End	Upper End	Lower End	Upper End	Lower End	Upper End	Lower End	Upper End
Pumping Wells									
maximum drawdown (ft)	36.9	47.0	30.5	32.3	39.2	36.9	36.9	36.9	36.9
time to maximum drawdown (yr)	9	13	12	8	7	6	12	8	10
200 feet east of pumping wells									
maximum drawdown (ft)	18.5	23.2	15.4	14.3	20.6	18.5	18.4	18.5	18.5
time to maximum drawdown (yr)	19	14	12	9	10	9	7	15	23
1/2 mile east of pumping wells									
maximum drawdown (ft)	5.2	6.5	4.4	3.6	6.2	5.2	5.2	5.2	5.2
time to maximum drawdown (yr)	7	21	9	6	7	5	10	7	8
1 mile east of pumping wells									
maximum drawdown (ft)	2.0	2.4	1.7	1.5	2.4	2.0	2.0	2.0	2.0
time to maximum drawdown (yr)	8	7	6	7	10	5	12	7	9

Notes:

1. Results are summarized for observation points east of the pumping wells because this is the direction in which maximum drawdown occurs within BVWSD.

Table 2: Summary of Simulation Results

FIGURES

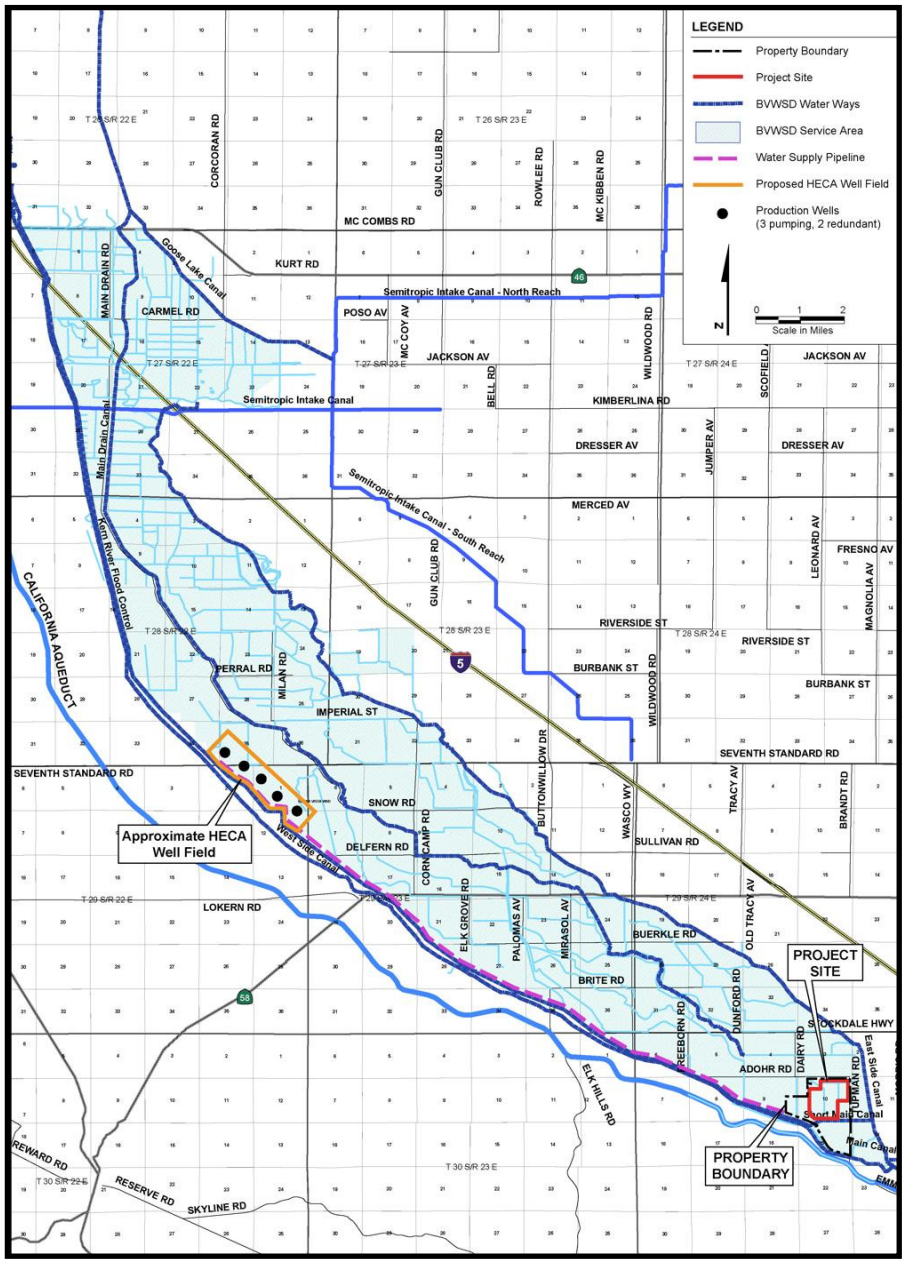


Figure 1: Project Site and Water Supply Well Field Location

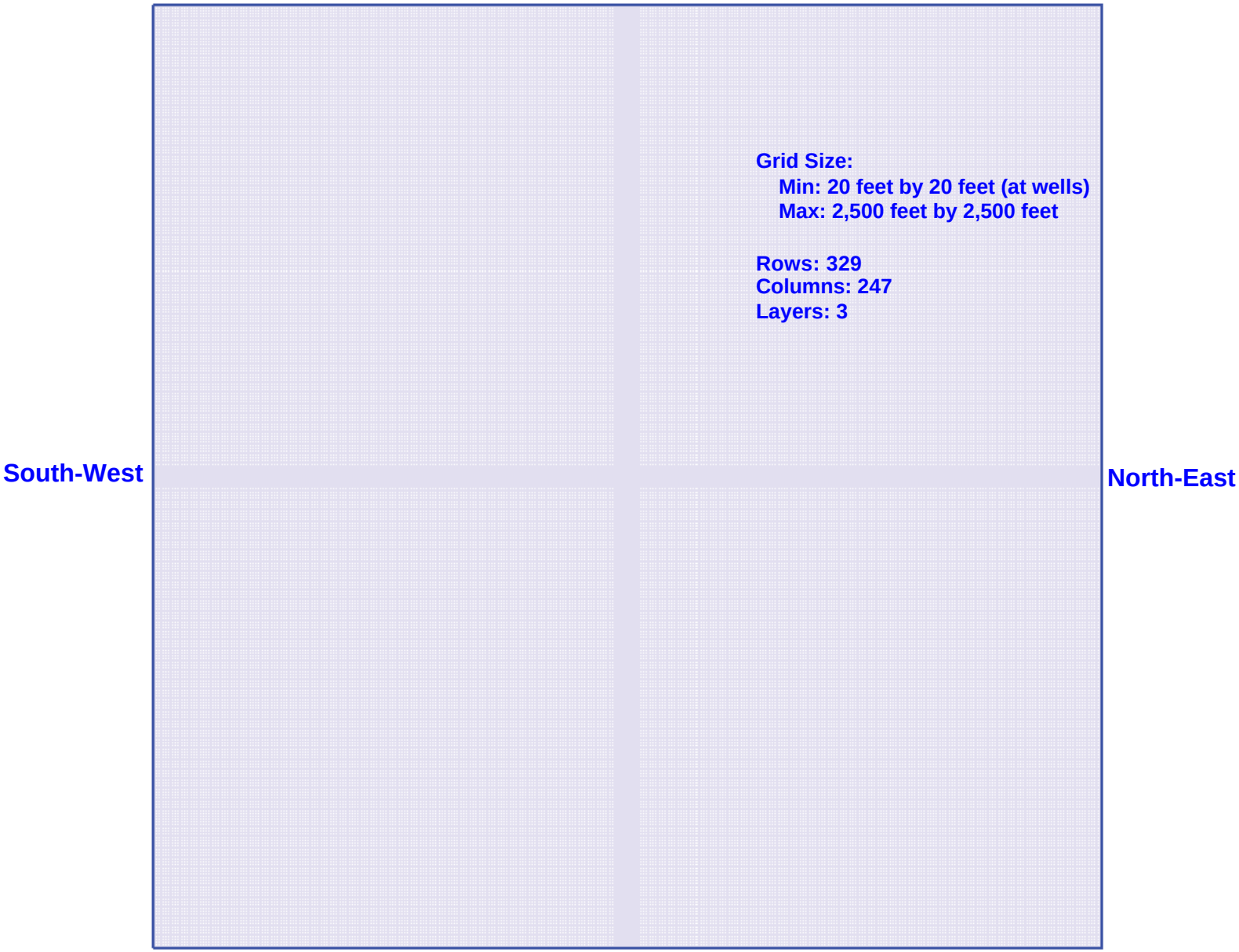


Figure 2: Model Domain and Finite-difference Discretization

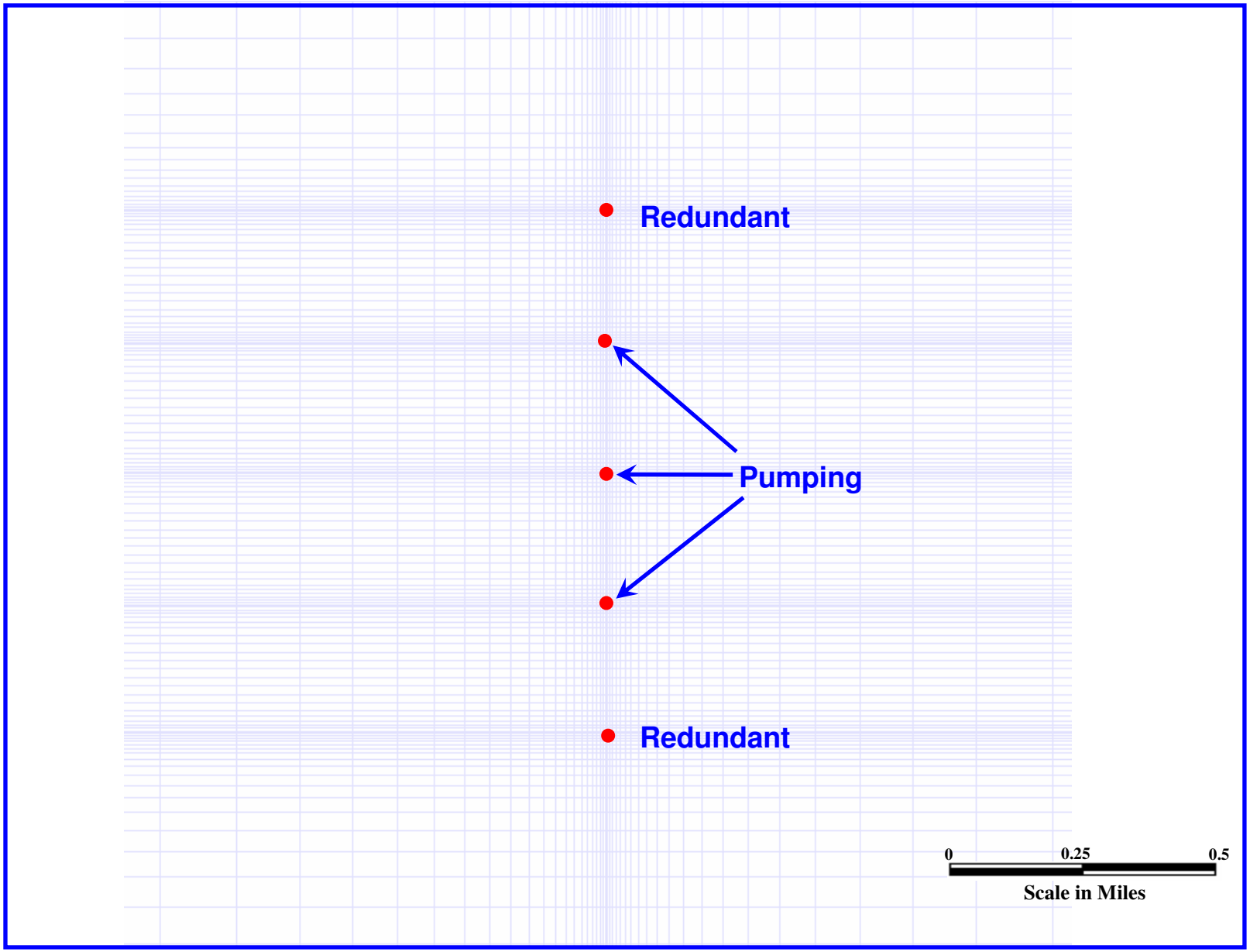


Figure 3: Pumping Well Locations in Model

(Well Spacing = 0.25 mile)

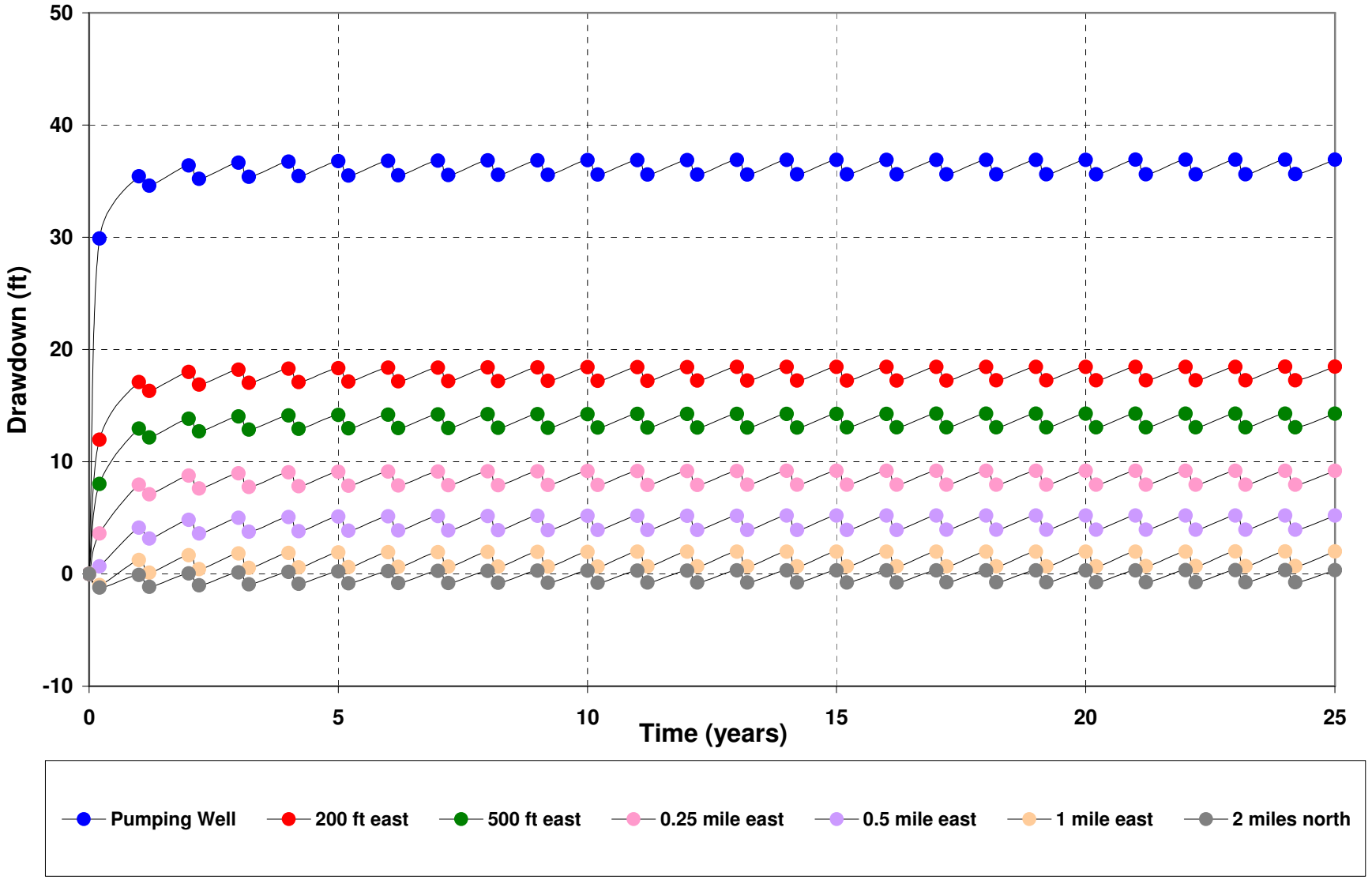


Figure 4: Simulated Drawdown at Select Observation Points

Base Case

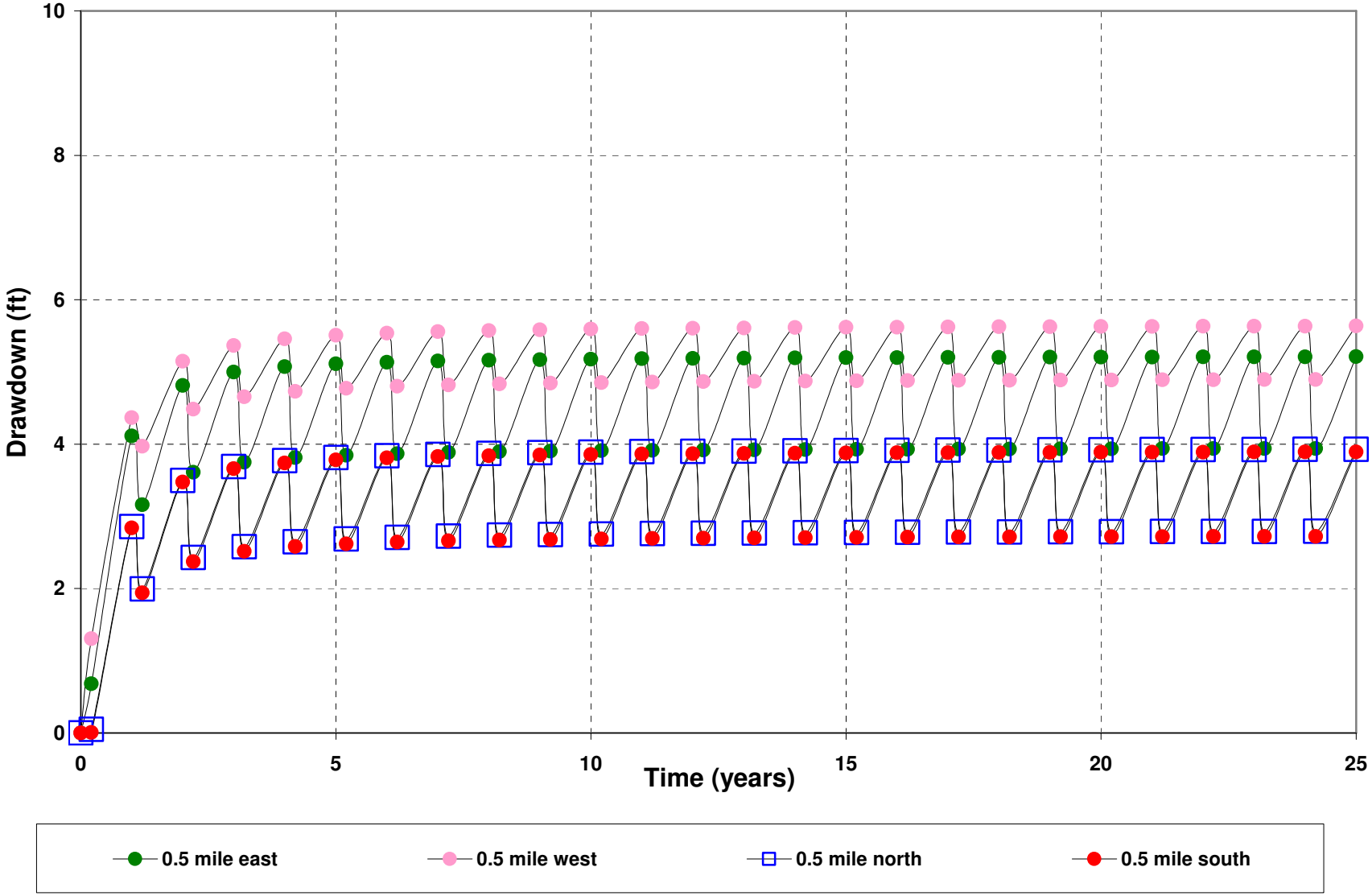


Figure 5: Simulated Drawdown at 0.5 Mile from the Pumping Wells in East, West, North, and South Directions - Base Case

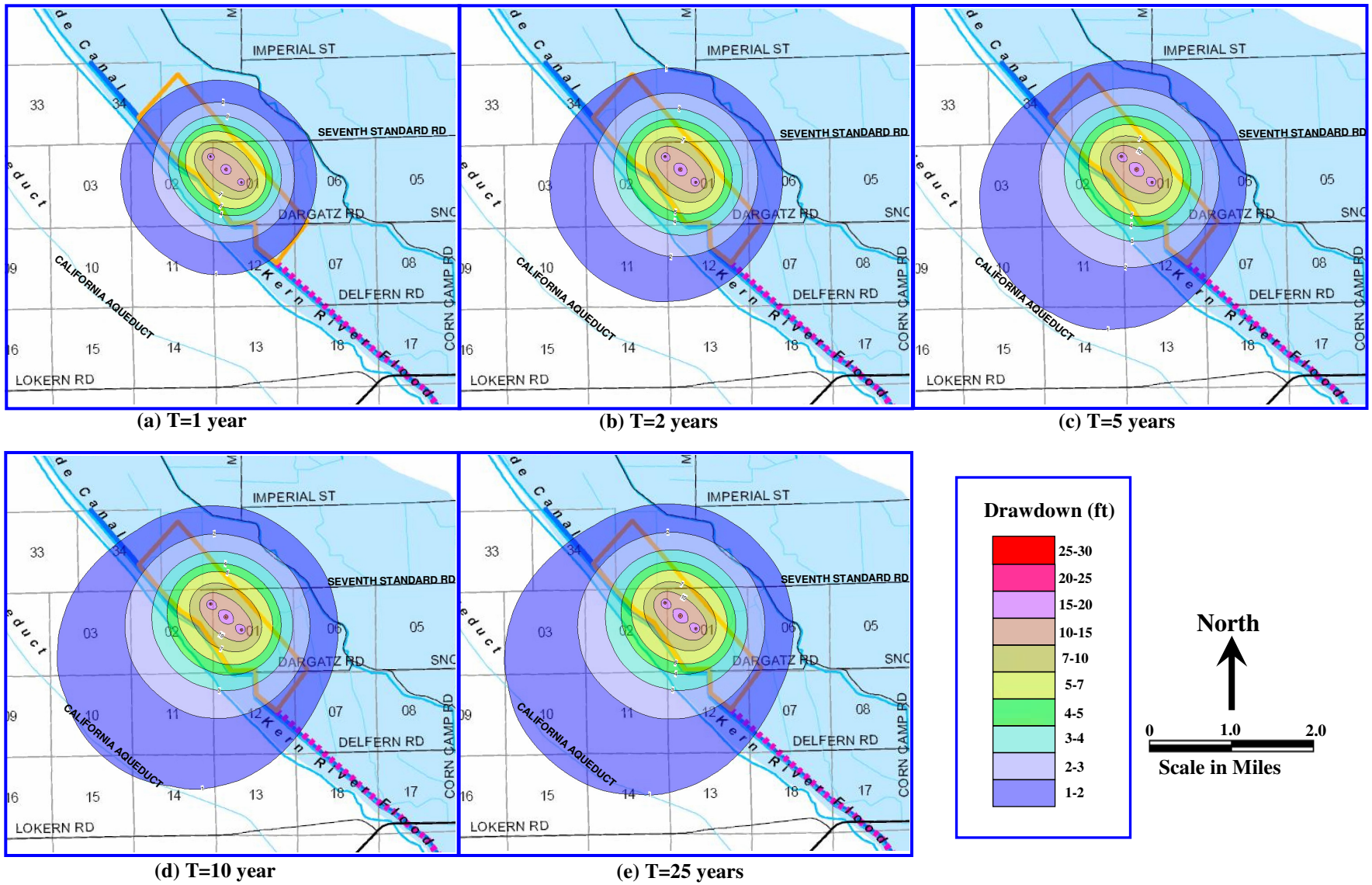


Figure 6: Contour Maps of Simulated Drawdown in Shallow Zone (Model Layer 1) at Various Times – Base Case

(Contour intervals = 1, 2, 3, 4, 5, 7, 10, 15, 20, 25, and 30 ft)

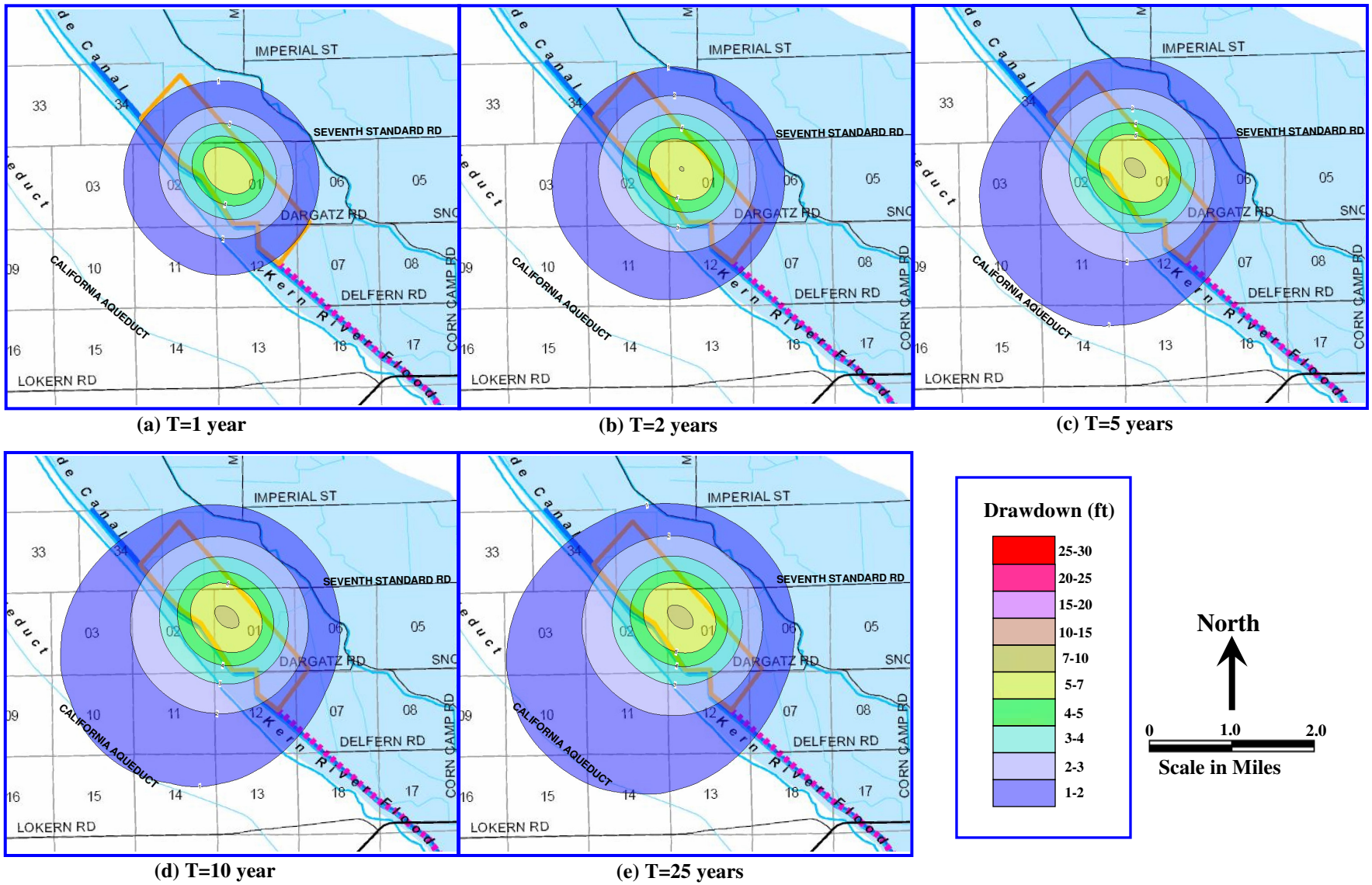
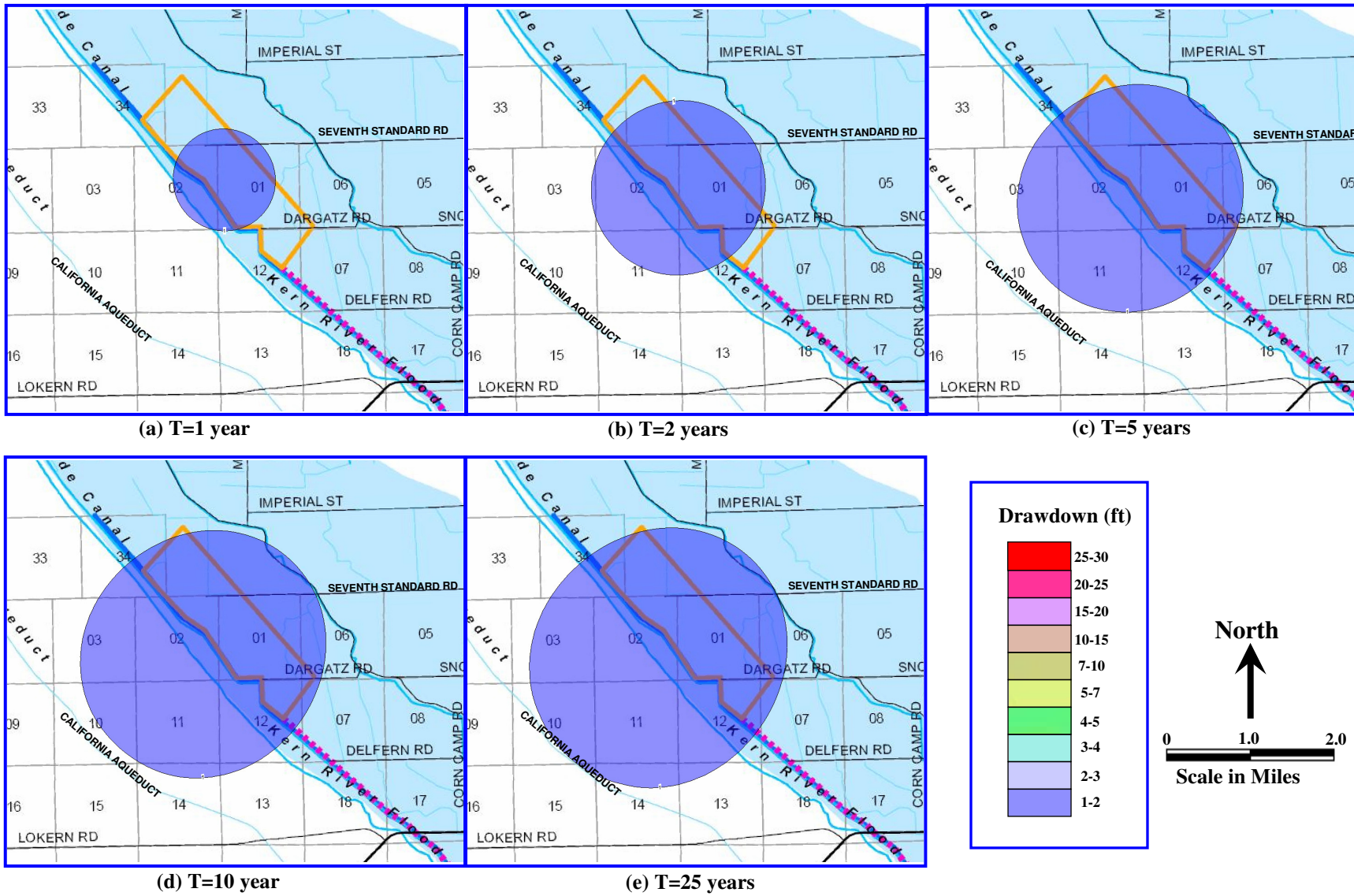


Figure 7: Contour Maps of Simulated Drawdown in Deep Zone (Model Layer 2) at Various Times – Base Case

(Contour intervals = 1, 2, 3, 4, 5, 7, 10, 15, 20, 25, and 30 ft)



(a) T=1 year (b) T=2 years (c) T=5 years

(d) T=10 year (e) T=25 years

Figure 8: Contour Maps of Simulated Drawdown in Deeper Zone (Model Layer 3) at Various Times – Base Case

(Contour intervals = 1, 2, 3, 4, 5, 7, 10, 15, 20, 25, and 30 ft)

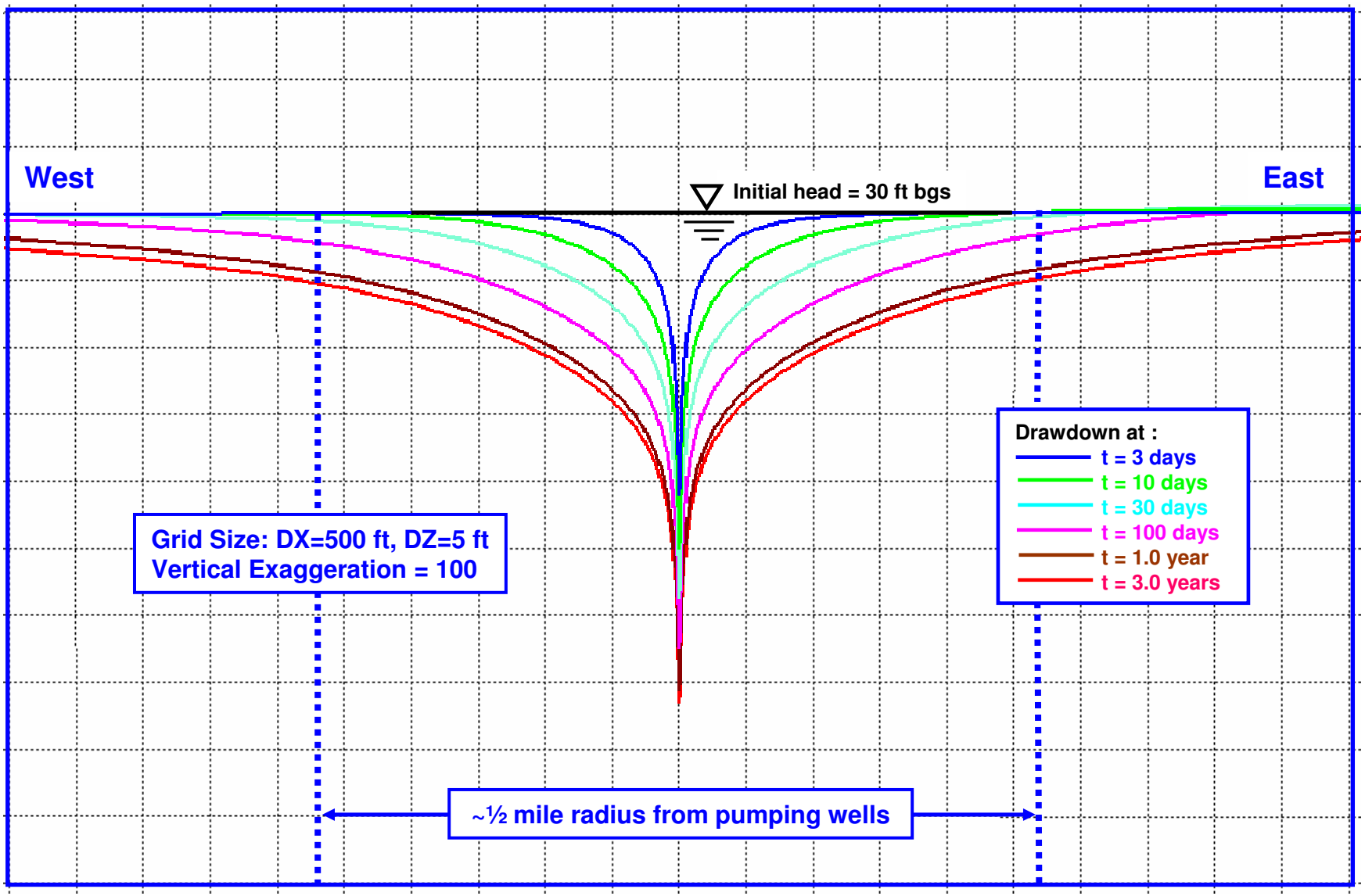


Figure 9: Simulated Groundwater Table Profiles at Various Simulation Times (perpendicular to well line)

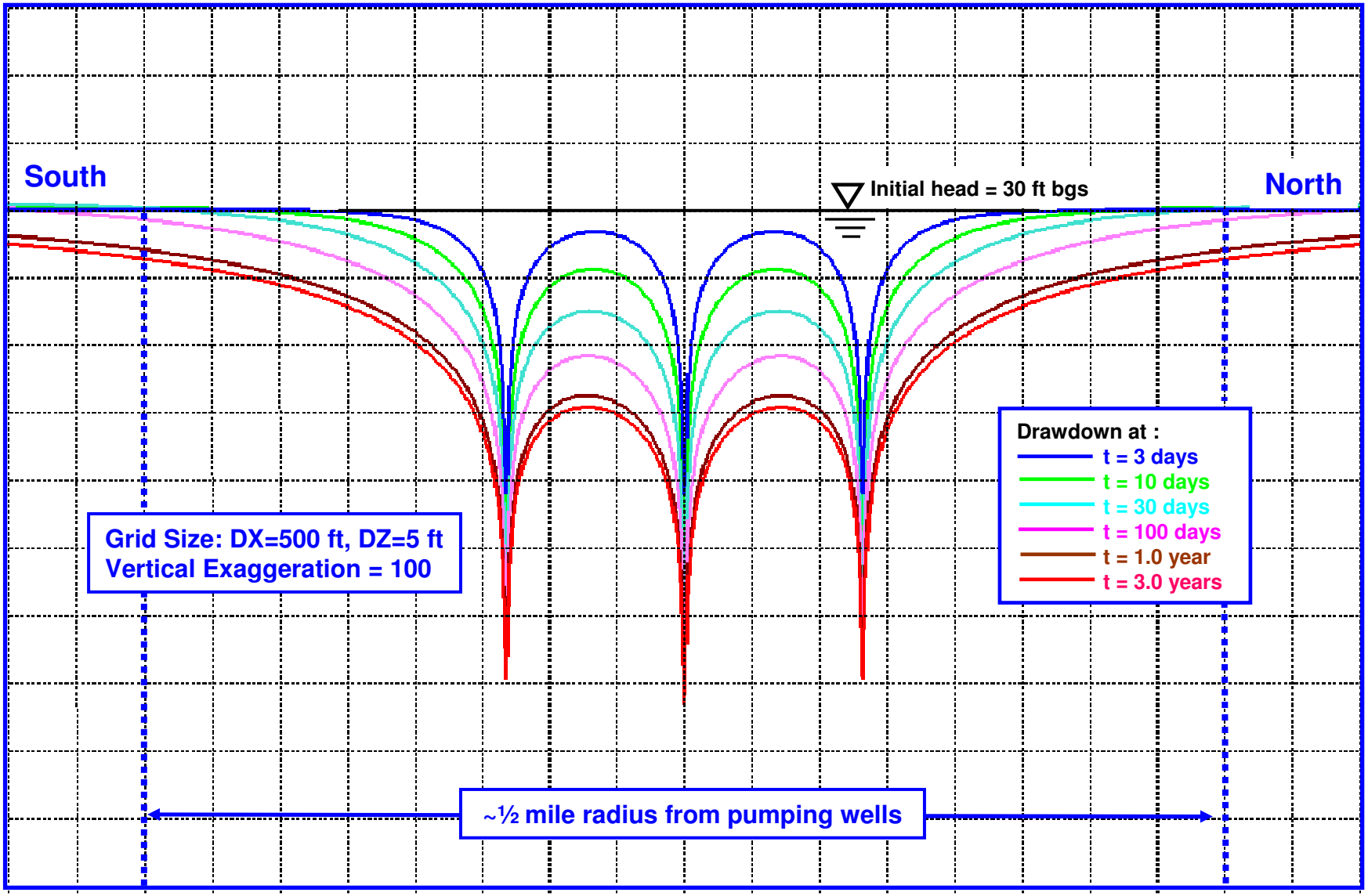


Figure 10: Simulated Groundwater Table Profiles at Various Simulation Times (along well line)

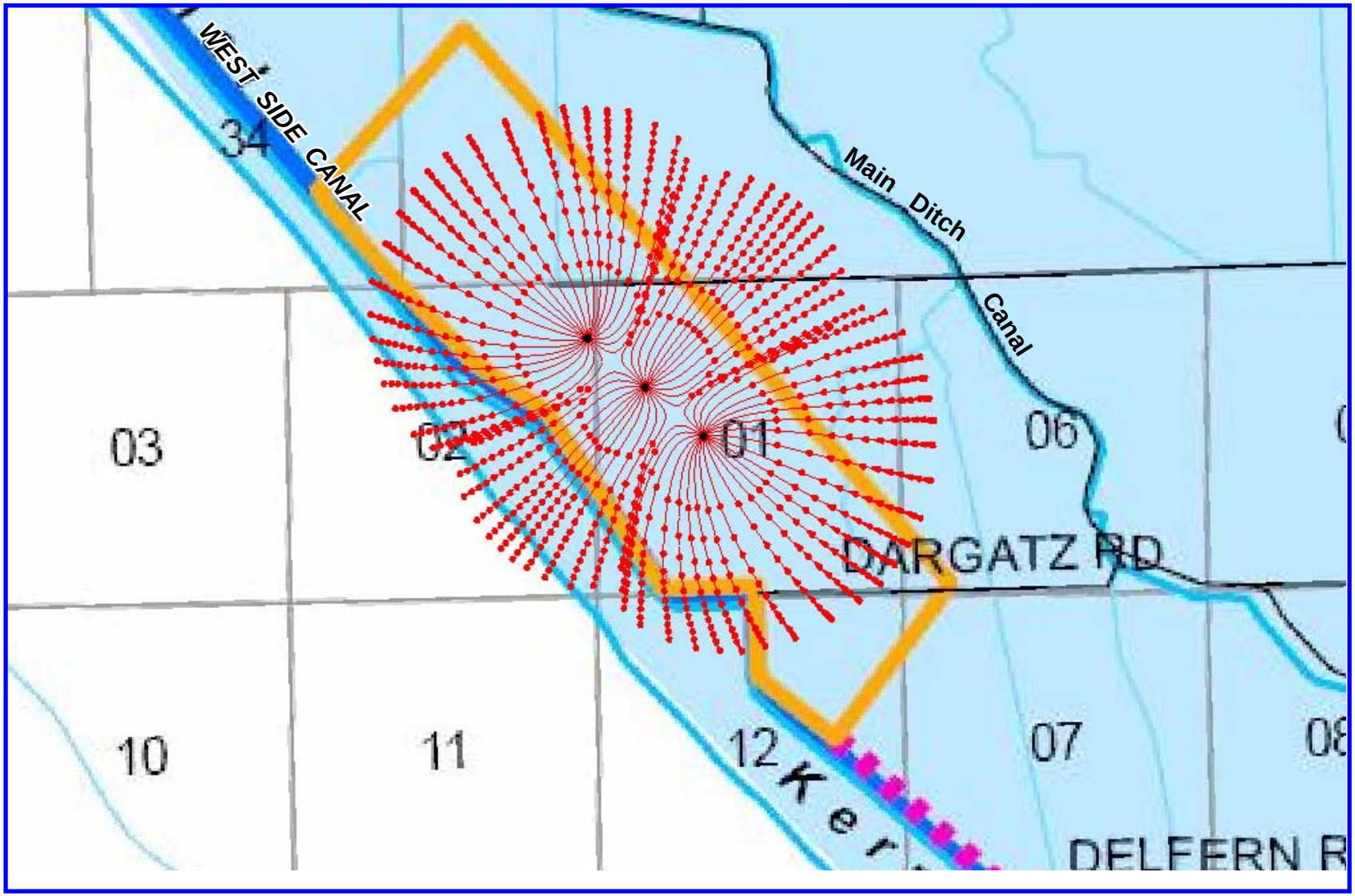


Figure 11: Simulated Groundwater Pathlines Induced by Project Pumping (travel time between arrow intervals = 2.0 years)

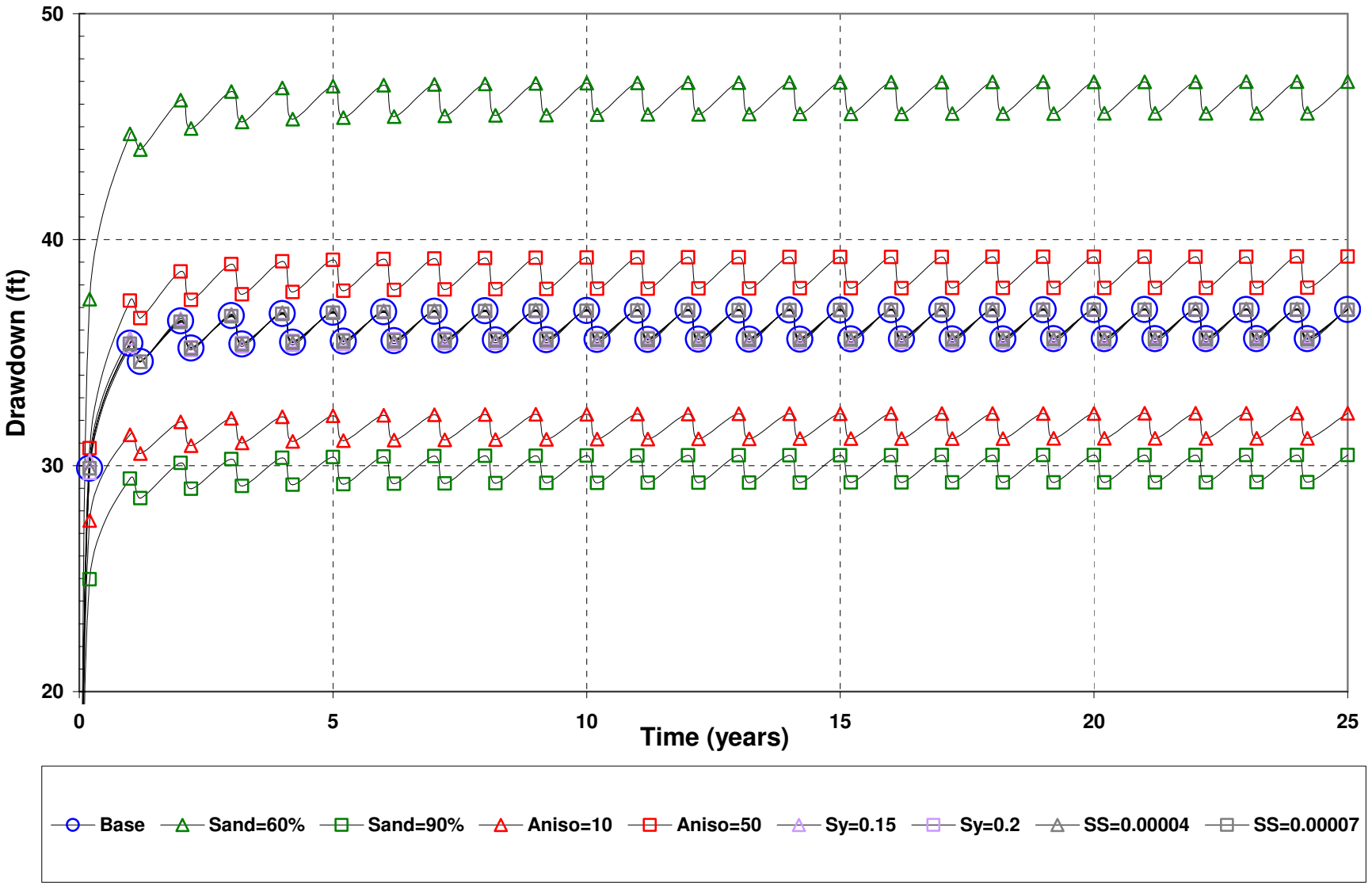


Figure 12: Sensitivity Comparison –

Simulated Drawdown at Pumping Wells

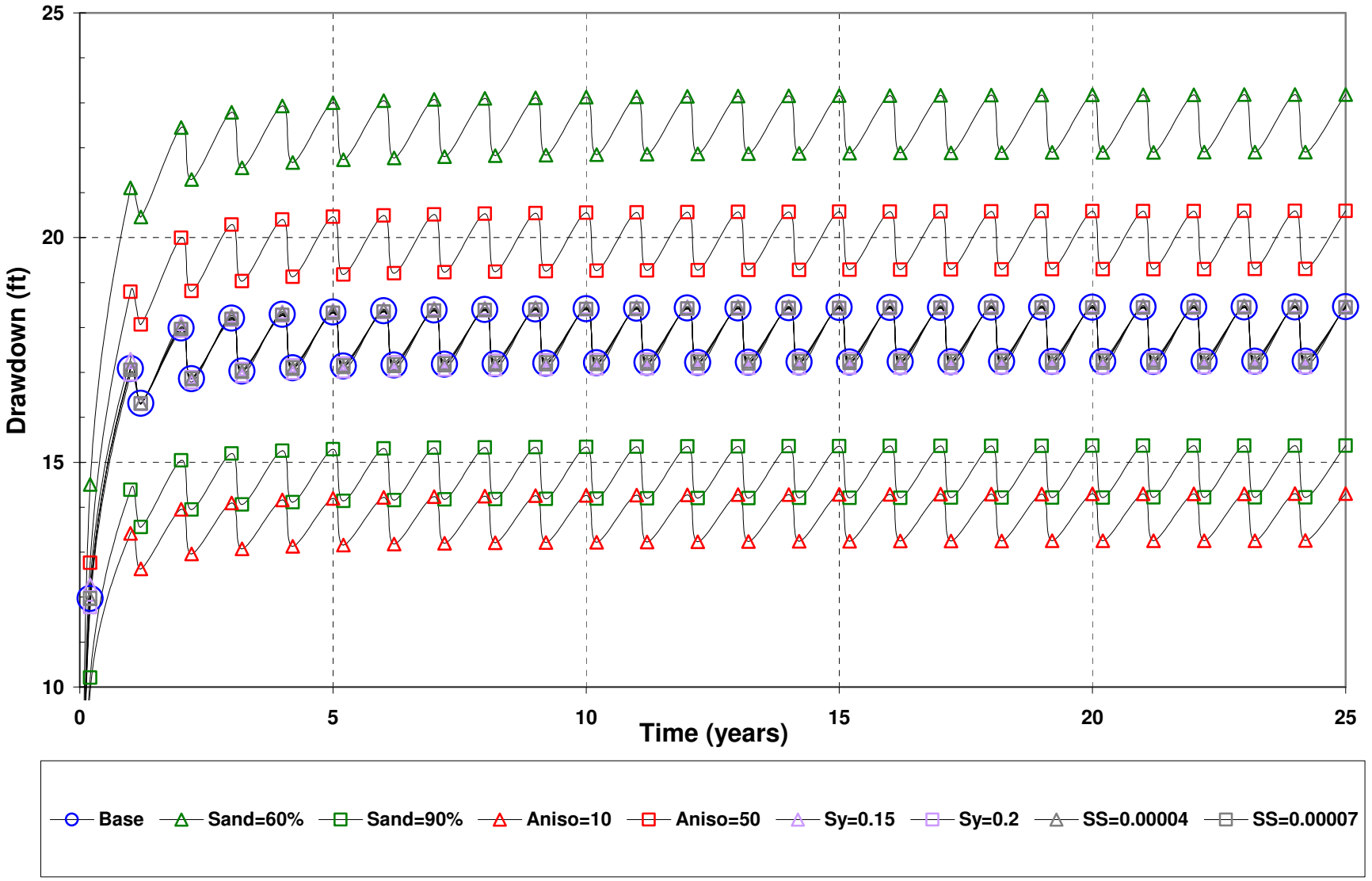


Figure 13: Sensitivity Comparison –

Simulated Drawdown 200 ft East of Pumping Wells

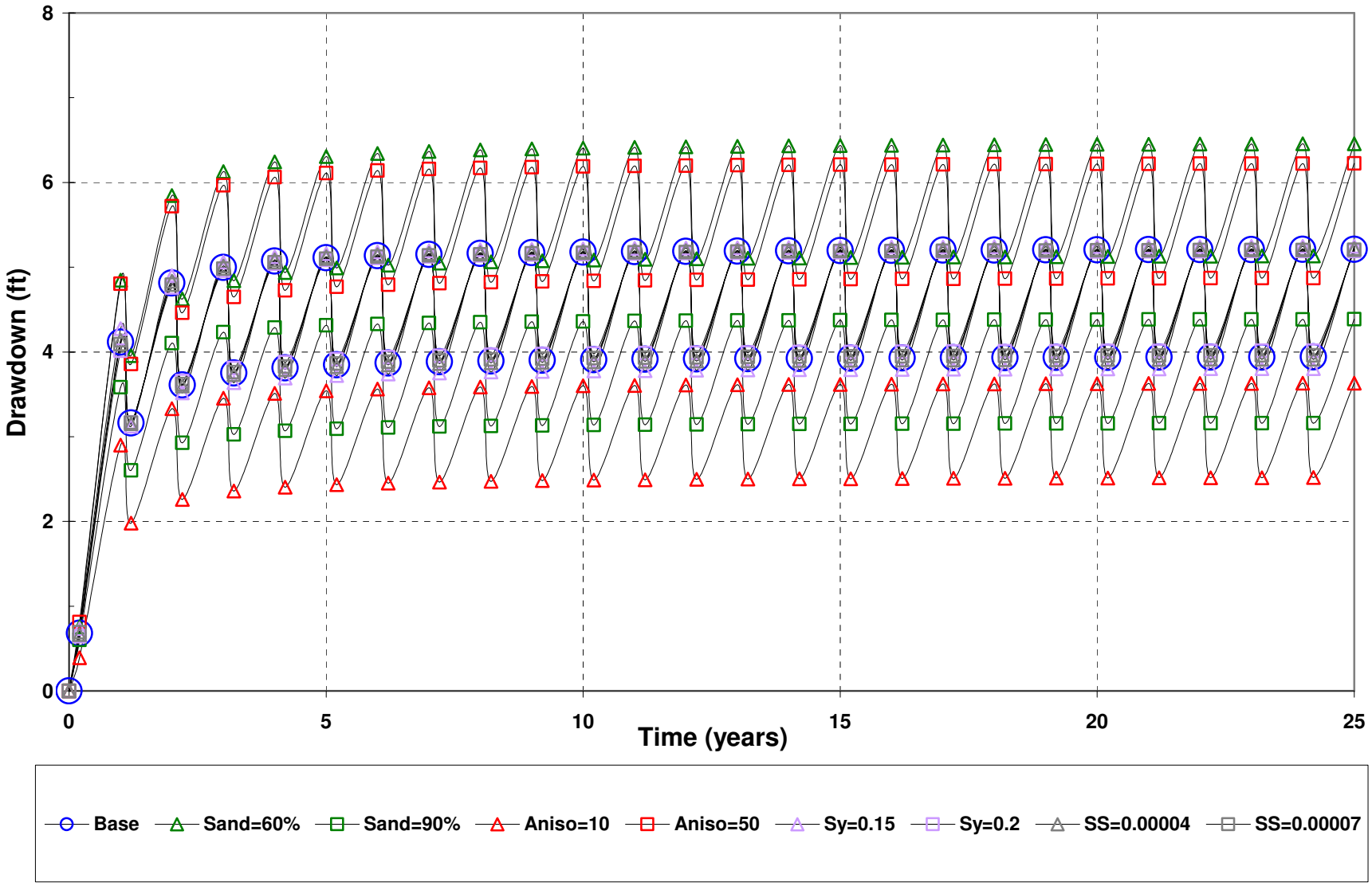


Figure 14: Sensitivity Comparison –

Simulated Drawdown 0.5 Mile East of Pumping Wells

Appendix N-3

BVWSD Groundwater Monitoring Plan

FINAL ENVIRONMENTAL IMPACT REPORT
FOR THE
BUENA VISTA WATER STORAGE DISTRICT
BUENA VISTA WATER MANAGEMENT PROGRAM

Submitted pursuant to the requirements of the
California Environmental Quality Act

by the

BUENA VISTA WATER STORAGE DISTRICT

State Clearinghouse No.
2009011008

The following may be contacted for additional information regarding this document:

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BUENA VISTA WATER STORAGE DISTRICT
FINAL ENVIRONMENTAL IMPACT REPORT
FOR THE
BUENA VISTA WATER MANAGEMENT PROGRAM

DECEMBER 2009

Prepared by

KRIEGER & STEWART, INCORPORATED
ENGINEERING CONSULTANTS
3602 UNIVERSITY AVENUE
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(951) 684-6900

SIGNATURE _____

DATE 12/21/09

578-8.2
(REPORTS/CEQA/578-8.2-DEIR)
VEM/DFS/jcb

APPENDIX B

BVWSD GROUNDWATER MONITORING PLAN

BUENA VISTA WATER STORAGE DISTRICT

GROUNDWATER MONITORING PLAN

The landowners of the District have long realized the importance of their groundwater supply. District staff, as directed by the Board of Directors, began monitoring the groundwater as early as the 1940s. Today the District not only maintains explicit surface water delivery records, but comprehensive groundwater monitoring records as well. Both of these programs have progressed with new technologies as new concerns for our basin's protection materialize. The goal of groundwater monitoring is to identify the causes of and find solutions to increasing pumping depths, perched water tables, and groundwater quality degradation. Of course, pumping costs increase as the depth to groundwater increases. Crop yields suffer due to shallow, saline groundwater continually in the root zone. Crop yields also decrease as groundwater quality degrades. The cause and effect relationship of such groundwater and water quality parameters provides for better management decisions. It is expected the District will continue to cooperate, participate, and contribute to the local water management community which is tasked to improve data collection and understanding of the Kern groundwater basin and how to best and equitably manage it. To that end this plan is always subject to modification and revision.

Production Well Surveys. The District currently measures the depth to groundwater in 57 of more than 200 irrigation wells quarterly. Water quality samples are also taken from about 25 wells and analyzed for standard irrigation constituents and other constituents of concern annually or when possible due to pumping cycles. Every five years, a full well survey monitors and classifies all irrigation wells within the District. Recorded data includes well location, state of use, depth to water, and any available pumping equipment physical characteristics.

Monitoring Wells. Currently there are 19 designated monitoring wells throughout the District (shown on attached map, "Monitored Pumping Zone Wells"). The District most recently completed three new monitoring wells in early 1994 (DMW-6, DMW-7, and DMW-8). They were located within the central part of the Buttonwillow service area to better cover the North-South alignment of the existing monitoring well grid. In 1992, in cooperation with the Kern Water Bank, the Department of Water Resources (DWR) installed three double completion monitor wells in the southern portion of the Buttonwillow service area to coordinate monitoring with the Kern Water Bank activities. All of the monitor wells are measured for depth to water quarterly and samples are taken and analyzed for standard irrigation constituents and other constituents of concern annually (summer).

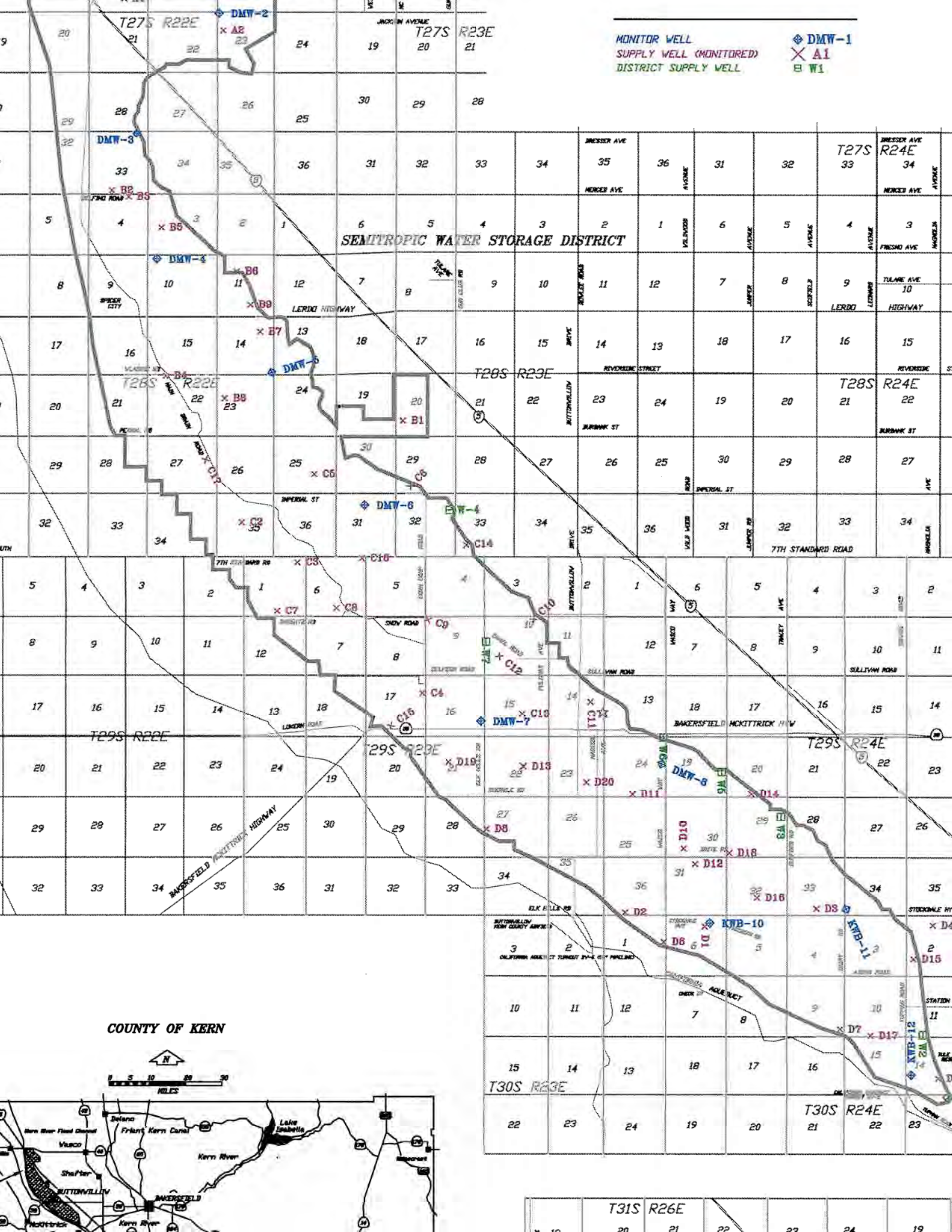
Shallow Piezometers. The District, in conjunction with the Department of Water Resources (DWR), has also installed 94 shallow piezometers, designed to assist in monitoring the shallow groundwater table within the northern portion of the District. These 20 foot deep wells measure the groundwater found in the upper zone of the soil profile. They are measured for depth to water quarterly and for salinity levels annually (spring). This data provides the information needed to plot shallow groundwater level contours to denote annual fluctuations as well as changes over time for both water levels and groundwater quality.

Crop Surveys. Annual Crop surveys provide data so that water demands can be better quantified. For that reason District staff annually produces crop survey maps and these maps are compiled in numerical spreadsheets so that total specific crop acreage can be calculated and summarized.

Surface Delivery Records. In part, surface delivery records are kept so that actual field delivery use can be determined. The District's Hydrography Department maintains detailed surface delivery records that show where, when, and how each acre-foot of

District water is utilized. Uses include such areas as: irrigation, canal losses, intentional recharge, reservoir losses, and conjunctive use programs.

Groundwater Balance Studies. An annual groundwater balance, reflecting groundwater recharge and recovery over time, has been continually updated for the District's operations since 1970. This is done so that the District can evaluate water put into basin storage for future use in the basin for a variety of purposes as deemed appropriate by the District.


MONITOR WELL
SUPPLY WELL (MONITORED)
DISTRICT SUPPLY WELL
DMW-1
A1
W1
SEMITROPIC WATER STORAGE DISTRICT
T27S R22E
T27S R23E
T27S R24E
T28S R22E
T28S R23E
T28S R24E
T29S R22E
T29S R23E
T29S R24E
T30S R23E
T30S R24E
T31S R26E
LERDO HIGHWAY
7TH STANDARD ROAD
BAKERSFIELD MCKITTRICK HWY
BAKERSFIELD MCKITTRICK HIGHWAY
COUNTY OF KERN
N
MILES
Delano
Friant Kern Canal
Vasco
Lake Isabella
Kern River
Shafter
BUTTONWILLOW
BAKERSFIELD
McKittrick

APPENDIX C

MEMORANDUM OF UNDERSTANDING REGARDING OPERATION AND MONITORING OF THE BVWSD GROUNDWATER BANKING PROGRAM

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 Mulkay)
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: Gen. Mgr.

HENRY MILLER WATER DISTRICT

By: _____

By: Joe Hatje

KERN COUNTY WATER AGENCY

By: Adrienne J. Mathews

By: _____

KERN DELTA WATER DISTRICT

By: _____

By: L. Mark Mulkay

KERN WATER BANK AUTHORITY

By: _____

By: William Phillimore

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

BY: _____

BY: Hal Crossley

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**

banking MOU.wpd

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:_____

EXHIBIT A

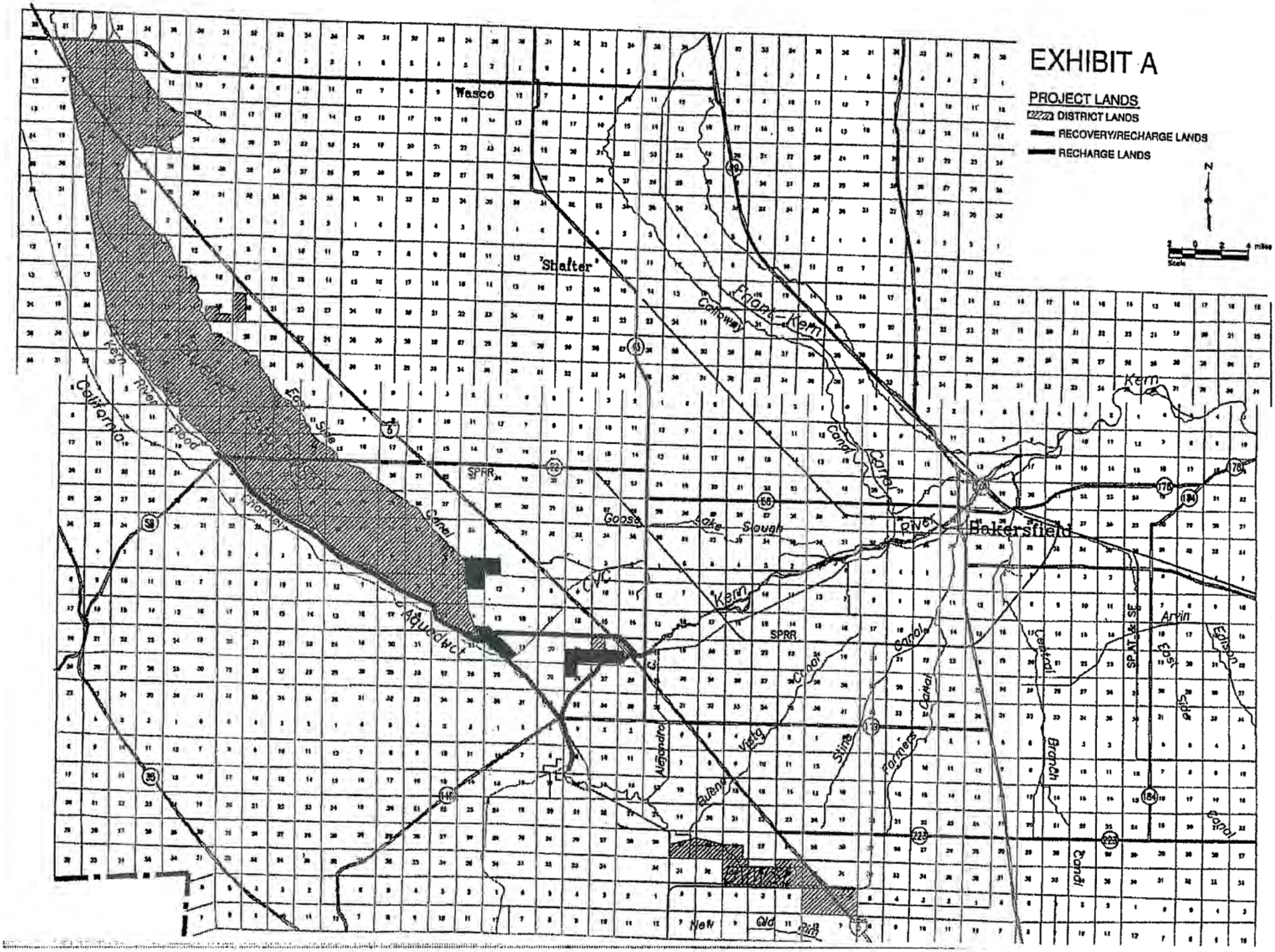

PROJECT LANDS
DISTRICT LANDS
RECOVERY/RECHARGE LANDS
RECHARGE LANDS
N
Scale
4 miles
Wasco
Shafter
Bakersfield
Arvin
Calloway
Frank-Kern
Kern
Canal
Goose Lake Slough
River
SPRR
CVC
Aqueduct
California
Kern River Flood
East Side
Central Branch
Edison
SPAT & SF
Stine
Farmers
Buena Vista
Alejandro
New
Old River

EXHIBIT B

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.

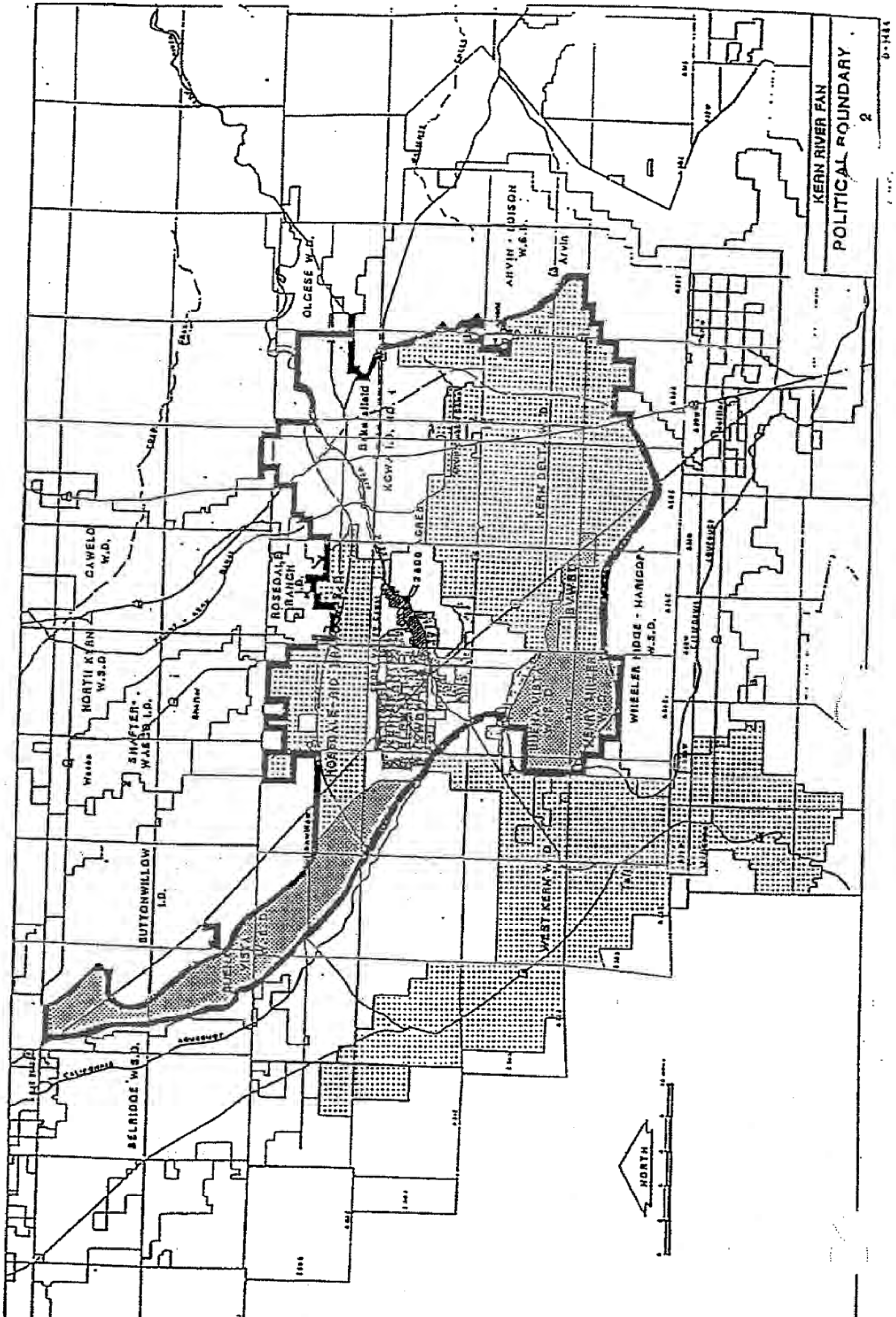

KERN RIVER FAN
POLITICAL BOUNDARY
2
OLCESE W.D.
ARVIN - EDISON W.S.D.
Arvin
Bakersfield
KERN DELTA W.D.
CAWELO W.D.
ROSEDALE RANCH I.D.
2800 ACRES
NORTH KERN W.S.D
SHAFTER-WASCO I.D.
WHEELER RIDGE - MARICOPA W.S.D.
BUTTONWILLOW I.D.
WEST KERN W.D.
BELRIDGE W.S.D.
NORTH

EXHIBIT C