

**MEMORANDUM OF AGREEMENT BETWEEN THE STATE OF CALIFORNIA  
DEPARTMENT OF FISH & GAME, DEPARTMENT OF WATER RESOURCES, AND  
DEER CREEK IRRIGATION DISTRICT FOR CONSTRUCTION, OPERATION,  
MAINTENANCE AND MONITORING OF A FLOW ENHANCEMENT PROGRAM ON  
DEER CREEK IN TEHAMA COUNTY**

This Memorandum of Agreement (“Agreement”), made this \_\_\_\_ day of \_\_\_\_\_, 2007, is between the Department of Fish and Game (DFG) and the Department of Water Resources (DWR)(collectively “the State”), and the Deer Creek Irrigation District (DCID).

**R E C I T A L S**

The State and DCID (collectively “the Parties”) recognize the need for a long-term solution to fish transportation issues in Deer Creek. In furtherance of that mutual goal, the proposed Deer Creek Flow Enhancement Program (“Program”) is intended to augment fish transportation flows in Deer Creek and meet the groundwater protection requirements of Tehama County’s AB 3030 Groundwater Management Plan. Therefore, the State enters into this Agreement to provide funding for the feasibility, planning and California Environmental Quality Act (“CEQA”) documentation for the proposed Program. Upon completion of CEQA process, the Parties shall decide whether to proceed with the proposed Program, which will be subject to modification based upon the results of the process.

DCID is a political subdivision of the State of California, duly organized and existing under Division 11 of the California Water Code and providing water service for the irrigation of lands and crops within the county of Tehama.

Deer Creek provides many important surface water beneficial uses, including agriculture, recreation, wildlife habitat, freshwater habitat, and anadromous fish habitat, particularly for spring-run Chinook salmon (*Oncorhynchus tshawytscha*) listed as threatened under the Federal and State Endangered Species Acts and steelhead trout (*Oncorhynchus mykiss*) listed as threatened under the Federal Act. Due in part to naturally occurring low flows, agricultural diversions, channel morphology and excessive temperatures, the upstream migration of adults

and/or downstream migration of juvenile salmon and steelhead may be impeded or blocked in some years.

DCID has adjudicated rights to divert Deer Creek surface water for irrigation.

Historically, DCID has cooperated with DFG by temporarily bypassing some of DCID's surface water to provide a short term pulse flow for fish transportation in Deer Creek.

## AGREEMENT

### I. General Terms

A. Under the proposed Program, Program Wells (as defined in § I.1) will be installed and operated to provide DCID with a supplemental agricultural water supply in an amount equal to the quantity of surface water diversions which DCID may forego in order to provide fish transportation flows.

B. This Agreement may be amended to include additional water supplies from efficiency improvements to DCID's distribution system or new water management techniques if it can be demonstrated that such improvements or techniques will allow DCID to forego additional surface water diversions in order to provide increased fish transportation flows under the proposed Program.

C. The Parties recognize that the timing of fish transportation flows is dependent on many variables and can change significantly based on annual climatic conditions, water temperature, agricultural diversions, channel morphology, etc. Although existing Deer Creek data is insufficient to predict the timing of salmon immigration and emigration with certainty, preliminary data indicates that increasing the transportation flow during late spring (April, May and June) and early fall (October and November) may be beneficial to Chinook Salmon and Steelhead populations. Therefore, initial operation of the proposed Program will be tied to real-time fisheries monitoring and limited to the months of April, May, June, October and November.

During these periods, flow-related impediments to migration may be alleviated, in part, by DCID bypassing surface water that it could otherwise divert for irrigation purposes.

D. The Parties also recognize that the exact amount of flow necessary to provide for immigrating of adult salmon and steelhead and emigrating juvenile salmon and steelhead in Deer Creek is unknown but also dependent upon annual climatic conditions, water temperature, agricultural diversions, channel morphology, etc. However, a preliminary adult upstream fish transportation flow objective of 50 cubic feet per second (cfs) was developed for the proposed Program based on an examination of comparable east-side streams in the Northern Sacramento Valley. A preliminary estimate of flow to move downstream migrating juvenile salmon and steelhead is defined as a contiguous flow from the lowermost diversion to the Sacramento River.

E. In accordance with the initial cost planning and permitting estimates (set out in Appendix A, attached), the proposed Program will operate from April 1 through June 30 and October 15 through November 15 when the Deer Creek flow, as measured below the Stanford Vina Diversion Dam, is equal to or less than 50 cfs, or upon mutual consent of DCID, DFG, and DWR. Program operations carried out pursuant to this Agreement will change from year to year, but will be within the projected range of initial planning and permitting estimates. Program operations will be implemented in flow capacity intervals which are practical for monitoring and approximately equal to the increased capacity associated with individual Program Well capacity and/or capacity intervals associated with water savings due to application of AgWUE measures. As such, Base Flow contribution by DCID may result in Deer Creek flow greater than 50 cfs, as measured below the Stanford Vina Diversion Dam.

F. An adaptive management methodology linked to a comprehensive Deer Creek Annual Monitoring Program (DCAMP) will be incorporated into the proposed Program in order to operate the proposed Program effectively and adequately evaluate its potential benefits and impacts. The DCAMP will include baseline surface water monitoring, (both instream and in-district), temperature monitoring, identification of critical channel morphology impediments, groundwater monitoring, and fisheries monitoring for the proposed Program. The DCAMP will

be implemented regardless of whether DCID water is bypassed or not to the extent necessary to provide the proposed Program with baseline data needs for assessment of fish movement timing, documentation of annual surface water diversions, and fulfillment of the requirements set forth by the Tehama County Groundwater Extraction and Off-Parcel Use Permit.

- G. The proposed Program will be implemented in two phases:
- (1) Phase one will fund installation and operation of up to two additional new agricultural water supply wells, and/or the retrofitting and leasing of up to two existing agricultural wells to create a capacity of 10 cfs of groundwater to be used in exchange for surface water bypassed by DCID. As further defined in this Agreement, phase one will also include Program-related operations, maintenance, permitting, and monitoring, as well as annual baseline monitoring associated with DCAMP.
  - (2) Phase two will be initiated after completion of the work being funded under Section A of DCID's 2004 Agricultural Water Use Efficiency (Ag WUE) Grant. In Phase two, the Parties will determine what amount of additional transportation flow can be made available to the Program through implementation of the agricultural water use efficiency measures and water management improvements described in DCID's 2004 AgWUE Grant application (attached as Appendix B).

Upon completion of both phases, DCID may have the additional capacity to provide approximately 15 to 18 cfs of instream transportation flow while meeting agricultural water demand requirements in the District. As noted above, the portion of this flow to be achieved through water use efficiency improvements would be subject to field monitoring and assessment. The timing, quantity of, and payment for operation, maintenance or other costs associated with additional flows shall be determined by mutual agreement of the Parties.

- H. The Parties agree that any water pumped by Program Wells to replace foregone surface water diversions that is left in-stream to provide fish transportation flows under the Program will not be transferred for export outside of the Deer Creek watershed. The

Parties agree that any water that is left in-stream under this Proposed Program will be solely for the purpose of preserving or enhancing fish and wildlife resources.

I. Definitions for the Agreement are as follows:

- (1) Program Wells. Those production wells designed, constructed, retrofitted or leased to provide groundwater in exchange for bypassed surface water.
- (2) Ag WUE. DCID Agricultural Water Use Efficiency Grant work.
- (3) DCAMP. Deer Creek Annual Monitoring Program.
- (4) Base Flow. The amount of surface water, bypassed by DCID, equal to the available replacement capacity from Program Wells (approximately 10 cfs), plus the additional capacity realized through implementation of Phase two Ag WUE measures (approximately 5 to 8 cfs). The Base Flow capacity will not exceed the total capacity available to DCID through the use of Program Wells and/or implementation of Ag WUE measures. The amount of capacity realized through implementation of Ag WUE measures shall be determined by mutual agreement of the Parties.
- (5) Pulse Flow. The amount of surface water, bypassed by DCID, that exceeds the Base Flow replacement capacity of Program Wells and Ag WUE measures. Pulse Flow will only be made available upon mutual consent of DCID, DFG, and DWR.
- (6) Bypassed Flow. The Deer Creek surface water that is bypassed by DCID, in association with this Program, which would have otherwise been diverted by DCID for agricultural use.
- (7) State Funding. Funds which are provided by any governmental agency or person to mitigate for, or conserve and manage, species impacted by water-related operations, including but not limited to funds to offset direct losses of fish caused by the State Water Project.
- (8) Extraction Permit. Tehama County Groundwater Extraction and Off-Parcel Use Permit required by Tehama County Ordinance 1617.

(9) Phase One. Includes DCID bypass of Deer Creek surface water at Base Flow capacity or, upon mutual consent, at pulse flow capacity, and in accordance with monitoring outlined in paragraph I.G(1) of this Agreement.

(10) Phase Two. In accordance with paragraph I.G(2), this includes DCID bypass of Deer Creek surface water at Base Flow equal to Program Wells capacity plus the capacity attributed to Ag WUE improvements or, upon mutual consent, at pulse flow capacity.

(11) Exchange Water. The groundwater made available to DCID by the Program Wells, and equal to the amount of surface water bypassed.

(12) Key Monitoring Well. Are groundwater level monitoring wells used to monitor compliance with the predetermined range of acceptable groundwater level fluctuations, as defined in Appendix C.

## **II. Specific Provisions**

### **1.0. Well Design, Construction, Operations and Maintenance**

1.1 DWR, as administrator of this Agreement, will pay all reasonable costs associated with the construction and operation, and maintenance Program Wells in accordance with both the budget as set forth in Appendix A and the terms set forth in Section 9.0 on payment. DWR will not be obligated to pay for operation and maintenance related to any non-Program use of the wells by DCID. The total capacity of Program Wells, including the previously constructed Pilot Well, will be at least 10 cfs.

1.2 DWR will provide technical assistance for the design, construction, development and testing of the Program Wells. DCID will consult with DWR in determining the location of the Program Wells.

1.3 DWR, with DFG concurrence, will pay to obtain access easements for installation and operation of Program Wells and related facilities, including any necessary leases of wells.

1.4 DCID will maintain and repair the Program Wells as needed, according to the manufacturer's recommended methods. DCID will operate all project related equipment in a

manner both safe and consistent with the proposed Program and keep accurate records of daily project well operations and annual flow volume.

1.5 DWR will pay DCID's approved costs associated with Program-related operation and maintenance of the Program Wells and expenses to administer the program in accordance with both the budget set forth in Appendix A and the terms set forth in Section 9.0 of this Agreement.

## 2.0 Ownership of Wells.

DCID shall hold all right, title and interest to any new wells, well housing, monitoring equipment, electrical and other appurtenances associated with the wells if such wells are constructed for the proposed Program utilizing State funding provided through this Agreement. DCID will be the Lessee for any existing wells to be leased as part of this program. However, DCID shall not enter into any Lease as part of this proposed Program without the prior written consent of DWR and DFG as to the terms of such Lease.

2.1 In the event that DCID withdraws from this Agreement within the Initial Program Term of the Agreement, or fails to comply with the terms of this agreement during the Initial Program Term resulting in the termination of the Agreement, DCID shall convey to the State all right, title and interest in the Program Wells, as well as all well-related leases or easements.

2.2 In the event the proposed Program is suspended or terminated through no fault of DCID, and DCID has fulfilled its obligations under this Agreement, then the ownership and use of the wells will be retained by DCID.

## 3.0 Groundwater Monitoring.

DCID will be responsible for obtaining groundwater extraction permits required by Tehama County. DWR shall perform groundwater monitoring and reporting and assist with obtaining any required groundwater extraction permits.

3.1 DWR will pay for the installation and operation of Program-related groundwater monitoring equipment for the Program Wells and the surrounding Key Monitoring Wells. The monitoring equipment will include flow meters on project production wells, continuous groundwater level recording instrumentation in project production wells, dedicated monitoring

wells, and key third-party monitoring wells. Flow meters in the project production wells will have the capability to record instantaneous discharge rate and total volumetric production.

3.2 DCID will obtain a Groundwater Extraction and Off Parcel Use Permit as required by Tehama County Ordinance 1617. DCID will coordinate with DWR and Tehama County to implement a groundwater monitoring and management program following the Guidelines outlined in Appendix C of this Agreement.

3.3 DWR will perform annual groundwater monitoring and reporting associated with the Groundwater Extraction and Off Parcel Use Permit through the first three years of the Initial Program Term, as defined in Section 12.0. Thereafter, and upon mutual agreement of all parties, funding and obligation for groundwater monitoring, the permitting, and reporting obligations may be transferred to DCID for the remainder of the term of this Agreement.

#### 4.0 Surface Water Monitoring.

4.1 As it relates to the proposed Program, DWR will operate and maintain the surface monitoring equipment for DCID's Deer Creek diversion. At a minimum, continuous monitoring of DCID's surface water diversion from Deer Creek will be operated and maintained between April 1<sup>st</sup> and November 30<sup>th</sup> using the existing parshall flume and datalogging equipment. DCID will measure and maintain surface water monitoring within the District's service area. Unless alternative funding is identified and approved by DWR and DFG, it is anticipated that funds from DCID's Ag WUE grant will pay for start-up of DCID's surface water monitoring within the District.

4.2 DWR will continue to operate and maintain the surface water gauging station below the Stanford Vina Ranch Irrigation Company (SVRIC) Diversion Dam through existing program funding. DWR will periodically monitor flow in Deer Creek above the SVRIC Dam for the first three years of initial program operations to determine the losses or gains in Deer Creek flow between the USGS gauge and the SVRIC diversion dam.

4.3 DWR will conduct additional surface water monitoring if it is deemed necessary by DFG and DWR to implement the program, especially during dry to critically dry water years.

#### 5.0 Fish Passage Management Assessment.

5.1 DFG will conduct a Fish Passage Management Assessment Program which will evaluate the productivity of any flow actions. These assessments will be used to adaptively manage the program and address four important issues related to the project: 1) When flow augmentation is necessary to achieve fish passage 2) How much flow is necessary to achieve fish passage 3) How to best utilize the available flow to achieve fish passage And, 4) How to gauge the effectiveness of the project. If necessary, DWR will provide funding to DFG to conduct the annual fish passage evaluation and reporting. Protocols for assessing and reporting the metrics necessary to address the issues set forth above have been developed by DFG and are included in Appendix D of this Agreement.

5.2 DCID will coordinate with DFG to implement the Fish Passage Management Assessment Program, as outlined in Appendix D, to identify the volume and timing of flow necessary to pass fish upstream in Deer Creek. The results of these assessments will be continuously evaluated to develop appropriate protocols for long-term assessment of instream flow in Deer Creek.

#### 6.0 Environmental Documentation.

6.1 DCID will be the lead agency for CEQA. To aid DCID in completing CEQA for the construction of Program Wells, DWR will provide DCID with the work products detailed and budgeted in Appendix A. In addition, DFG will provide DCID with the information regarding potential impacts to salmon and steelhead which is necessary to prepare that portion of the CEQA biological resources analysis relating to anadromous fish. DCID recognizes that other sources of information may be needed to complete the CEQA biological resources analysis.

6.2 DWR shall reimburse DCID up to \$50,000 to complete an appropriate CEQA document. The State's share of these costs shall not exceed \$50,000 unless approved in accordance with Section 10.0.

6.3 If DCID is unable to fulfill the CEQA obligation for the program, DWR and DFG may, through mutual agreement, provide additional funds or staff services to assist DCID in the completion of the necessary environmental review, with DCID remaining as the lead agency.

#### 7.0 Program Operations.

7.1 DFG designates the following person as responsible for real-time decisions regarding operation of bypass flows according to Section 7.1:

Randy Benthin  
Senior Fisheries Biologist  
North Central North Coast Region  
Department of Fish and Game  
601 Locust Street  
Redding, CA 96001  
(530) 225-2372  
RBenthin@dfg.ca.gov

7.2 DFG may request from DCID Base Flow for fish transportation in Deer Creek, below the DCID diversion. Upon such request by DFG, DCID shall provide such Base Flow. During Phase Two the additional Base Flow capacity will not exceed the total capacity available to DCID through the use of Program Wells and/or implementation of Ag WUE measures. The amount of capacity realized through implementation of Ag WUE measures shall be determined by mutual agreement of the Parties.

7.3 Upon request of DFG and mutual consent of DCID, DCID will bypass Pulse Flows for fish transportation in Deer Creek, below the DCID diversion. Pulse Flows will only be made available upon mutual consent of DCID, DFG, and DWR.

7.4 DCID will have full use of the Program Wells outside the needs of this proposed Program. Such use by DCID will be within the operating parameters of the Tehama County Groundwater extraction and Off Parcel Use Permit and the groundwater monitoring and management guidelines in Appendix C. If the wells are used to provide other than Program water, DCID shall pay the operations costs to pump such water. Any such use of Program Wells for non-Program purposes is also subject to the restriction set forth in Section H.

7.5 In the event that the funding is not available to pay for the operation of Program Wells in any given year, up to the amount budgeted in Appendix A, DCID will have no obligation to the State under this Agreement to bypass water. This release of the obligation to provide bypass water shall not apply to funds which DCID requests which have not been approved by DWR and DFG and are either or both of the following: 1) not explicitly authorized by Appendix A; or, 2) exceed the amounts contained in Appendix A.

8.0 Water Accounting Methodology.

8.1 Accounting of DCID's foregone surface water will be based on the change in DCID's Deer Creek diversion, as measured at the DCID's gauged Parshall closest to their Deer Creek Diversion, for the times immediately prior to and after the bypassed flow was requested.

8.2 DCID shall keep daily records of the amount of Base Flow or Pulse Flow bypassed by DCID. DCID shall provide DWR and DFG with a monthly accounting of these flow measurements.

8.3 DCID shall be able to substitute groundwater from the Program Wells in an amount equal to the surface water bypassed. DCID will have one year from the date the surface water is bypassed to make such a groundwater substitution.

8.4 Accounting of groundwater extraction shall be expended in the order it is accrued so as to allow maximum flexibility of groundwater use within the one-year period.

8.5 DCID shall keep a daily groundwater extraction record. A monthly copy shall be provided to DWR and DFG. DCID shall also provide DWR and DFG with a monthly reconciliation sheet showing the earliest date of bypassed surface water (i.e., the one-year limitation) and the amount of groundwater pumping costs (in volume) accrued.

8.6 If the program is suspended or terminated and DCID has fulfilled its obligations under this Agreement, DWR will continue to pay for the operations and maintenance to pump wells equal to the amount of bypass flow provided by DCID, but not yet substituted through groundwater extraction with Project Wells.

#### 9.0 Maintenance of Bypass Flow.

9.1 In accordance with Sections 7.2, DCID is responsible for ensuring water is bypassed by the DCID Diversion Dam in an amount equal to the requested Base Flow or Pulse Flow.

9.2 DFG and DWR, with the support of DCID, will request downstream diverters to voluntarily cooperate in the bypass of water made available by DCID through this Agreement. If downstream diverters do not cooperate in allowing DCID Bypassed Flow past their diversions, then the State may suspend the Program upon thirty (30) days written notice. During the suspension, as owner of the Program Wells, DCID may use and pay for the operation and maintenance of the wells pursuant to Section 7.4. Additionally, DCID will be allowed to pump pursuant to Section 8.6. The parties may decide by mutual concurrence during the suspension to

continue some portions of the proposed Program. Any continuance of portions of the Program during suspension shall be by the mutual consent of DCID, DWR and DFG and shall be in writing.

9.3 Upon mutual agreement of DCID, DWR, and DFG, if it is determined that legal proceedings are necessary to ensure the bypass of water, then this Agreement may be amended to provide funding for such proceedings. However, before DCID incurs any costs or fees pursuant to this section, DWR and DFG must both agree in writing as to whether any proceeding shall be undertaken and, if so, the estimated budget of reasonable costs and fees.

#### 10.0 Payment

DFG and DWR shall jointly approve of the final budget for planning and environmental review set forth in Appendix A. In addition, Appendix A includes proposed construction and operational budgets. Following completion of the CEQA process, DFG and DWR shall approve the final construction and operational budgets and amend Appendix A, if necessary.

DWR will reimburse DCID on a monthly basis for those expenses directly associated with the proposed Program in accordance with the approved budget set forth in Appendix A. DWR may reimburse DCID for those expenditures which are within both the categories and amount of any final budget without further DFG concurrence unless DFG requests that a particular expenditure be discussed with the Program Management committee established in Section 11.0. In addition, any request for payment which exceeds or is inconsistent with Appendix A shall be subject to approval by both DFG and DWR.

#### 11.0 Program Management

The parties shall establish a management committee of two representatives from each party (DCID, DFG, and DWR), to discuss issues regarding program implementation, reporting, budgets, finances, and dispute resolution.

#### 12.0 Term of this Agreement

This Agreement becomes effective when all Parties have signed. If, upon completion of the CEQA process, the Parties decide to proceed with the Program the Program start date shall

be April 1, 2009. The Program term will be ten years with an end date of November 15, 2018. Adjustments to the start date will only be made upon mutual consent of DCID, DWR, and DFG.

### 13.0 Dispute Resolution

The management committee shall make reasonable efforts to resolve any disputes that may arise from this Agreement in a prompt and timely manner. In the event of a dispute, the Party claiming a dispute shall give notice of the dispute to the other Parties. Such notice shall include a brief description of the matter in dispute and the relief sought. The management committee shall hold at least two informal meetings to resolve the dispute, commencing within 45 days after the dispute notice is sent to the parties.

If the dispute is not resolved by the management committee through the informal meetings, the directors of DFG, DWR, and DCID shall decide whether to use a third-party mediator. The decision whether to pursue mediation shall be made within 20 days after the conclusion of the informal meetings set forth above. The disputing Parties shall agree on an appropriate allocation of any costs of the mediator employed under this section. Mediation shall not occur if the disputing Parties cannot agree on the allocation of costs. The disputing Parties shall select a mediator within 30 days of the decision to pursue mediation, including the agreement of allocation of costs. The mediation process shall be concluded no later than 60 days after the mediator is selected. The above time periods may be shortened or lengthened upon mutual agreement of the disputing Parties.

The Parties shall also bear their own costs and attorneys' fees related to any dispute resolution proceeding.

### 14.0 Withdrawal

Any Party to this Agreement wishing to withdraw from this Agreement must provide a written notice to each other Party specifying the reason the notifying Party wishes to withdraw. The Parties shall promptly meet and confer in a good faith effort to address and resolve, if possible, the issue(s) causing the notifying Party to wish to withdraw from this Agreement. If following such meeting the notifying Party still wishes to withdraw, such Party can withdraw 30 days after the date of the written notice and, notwithstanding Section 15.0, this Agreement shall terminate.

## 15.0 Termination.

15.1 The Agreement shall be subject to termination if the State does not fund the one time estimated start up costs set forth in Table 2 of Appendix A. The Parties acknowledge that the funding of this Agreement may be delayed for reasons beyond the control of either DWR or DFG, and that a delay in funding shall not automatically terminate this Agreement. At least 45 days prior to termination, the Parties shall meet and confer in order to explain the reason for any delay in funding, and DCID shall allow the State a reasonable amount of time to resolve any issues regarding funding, including finding alternative sources of funding for the Program.

15.2 The Agreement shall be subject to termination if the State does not annually fund the yearly operations costs set forth in Table 1 of Appendix A. The Parties acknowledge that the funding of this Agreement may be delayed for reasons beyond the control of either DWR or DFG, and that a delay in funding shall not automatically terminate this Agreement. At least 45 days prior to termination, the Parties shall meet and confer in order to explain the reason for any delay in funding, and DCID shall allow the State a reasonable amount of time to resolve any issues regarding funding, including finding alternative sources of funding for the Program.

15.3 The Agreement shall be subject to termination if DCID does not provide Base Flow. At least 45 days prior to termination, the Parties shall meet and confer to discuss the reasons that DCID is unable to provide Base Flow, and attempt develop a solution in order for DCID to provide Base Flow.

## 16.0 Renewal

At the end of the Initial Program Term, the parties may revise and/or renew the Agreement.

## 17.0 Effect of this Agreement on Other Matters

17.1 As a Precedent. Nothing in this Agreement, and nothing incorporated by reference into the terms of this Agreement, is intended or shall be construed as a precedent or other basis for any argument that the participants to this Agreement have waived or compromised their rights which may be available under state or federal law, except as to the matters addressed in this Agreement.

17.2 As an Admission. Nothing in this Agreement shall be construed as an admission by any Party that such Party has obligations relative to the protection of fishery or other resources and/or the maintenance of water quality standards in Deer Creek, the Delta, the Sacramento River, or its other tributaries. Similarly, nothing in this Agreement shall be construed or used in an effort to demonstrate that DCID has surplus water or water which is not being beneficially used by DCID.

17.3 Federal and State Agency Obligations. Nothing in this Agreement is intended to limit the authority of DWR, DFG, or any other agency of the State, to fulfill its responsibilities under federal or state law. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of DWR, DFG, or any other agency of the State.

#### 18.0 Representation by Counsel

This Agreement is entered into freely and voluntarily. The parties hereto acknowledge that they have been represented by counsel of their own choice, or that they have had the opportunity to consult with counsel of their own choosing, in the negotiations that preceded the execution of this Agreement and in connection with the preparation and execution of this Agreement. Each of the parties hereto executes this Agreement with full knowledge of its significance and with the express intent of affecting its legal consequences. In any action by a Party to this Agreement challenging the Agreement, each party is to bear its own fees and costs including attorney fees. Such fees and costs shall not be reimbursable as Program-related costs or expenses.

#### 19.0 Entire Agreement

This Agreement, including Appendices A through E, constitutes the entire Agreement between the Parties and obligations between them. This Agreement supersedes all prior and contemporaneous agreements and/or obligations concerning those obligations which are merged into this Agreement. Each party has made its own independent investigation of the matters settled, has been advised concerning the terms of this Agreement by counsel of its choice or has had an opportunity to be so advised, and is not relying upon any representation not specified herein.

## 20.0 Applicable Law

This Agreement shall be construed under and governed by the laws of the State of California and of the United States, without giving effect to any principles of conflicts of law if such principles would operate to construe this Agreement under the laws of any other jurisdiction.

## 21.0 Construction of Agreement

This Agreement is the product of negotiation and preparation by and among each party hereto and its attorneys. Therefore, the parties acknowledge and agree that this Agreement shall not be deemed to have been prepared or drafted by any one party or another. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement.

## 22.0 Modification of Agreement

No supplement, modification, waiver or amendment with respect to this Agreement shall be binding unless agreed to in writing by the Parties. However, this requirement does not apply to supplementing, modifying, or amending Appendix A as agreed to by the Parties.

## 23.0 Counterparts of Agreement

This Agreement may be signed in any number of counterparts by the parties hereto, each of which shall be deemed to be an original, and all of which together shall be deemed one and the same instrument. This Agreement, if executed in counterparts, shall be valid and binding on each party as if fully executed all on one copy.

## 24.0 Notice

Any written notice required to be given by this Agreement shall be deemed to have been given by the notifying party when mailed, postage prepaid or delivered to the following specified representatives or their replacements:

For DCID: Tim O'Laughlin  
2580 Sierra Sunrise Terrace, Suite 210  
Chico, CA 95928

For DWR: Dan McManus  
Department of Water Resources  
2440 Main Street  
Red Bluff, CA 96080

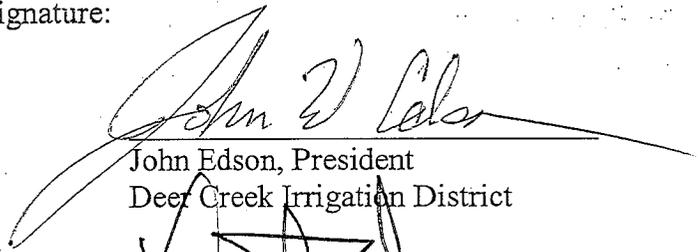
For DFG: Patricia Bratcher  
North Central North Coast Region  
Department of Fish and Game  
601 Locust Street  
Redding, CA 96001

25.0 Signatories' Authority

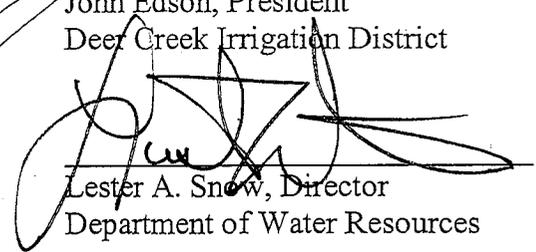
The signatories to this Agreement on behalf of all the parties hereto warrant and represent that they have authority to execute this Agreement and to bind the parties on whose behalf they execute this Agreement.

IN WITNESS WHEREOF, the following parties have executed this Agreement to be dated as effective on the day and year of the last signature:

DATED: 8-14-2007

  
John Edson, President  
Deer Creek Irrigation District

DATED: 9-10-07

  
Lester A. Snow, Director  
Department of Water Resources

DATED: 8-27-07

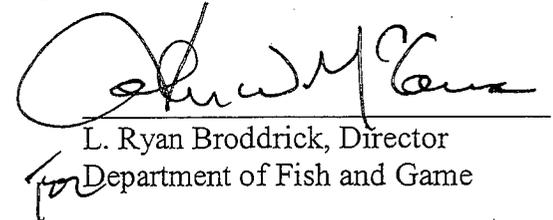
  
L. Ryan Broddrick, Director  
for Department of Fish and Game

Table 1. Estimated Annual Operations, Maintenance, Monitoring and Management Budget

DEER CREEK FLOW ENHANCEMENT PROGRAM ESTIMATED ANNUAL O&M COSTS	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	10-YEAR TOTAL
<b>ANNUAL OPERATIONS, MAINTENANCE, MONITORING and MANAGEMENT (O&amp;M BUDGET)</b>												
<b>PRODUCTION WELL O&amp;M</b>												
Power Costs (800 af)	\$ 15,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 315,000
Lease Existing Well (240 af)	\$ 2,400	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 50,400
Equip. Maintenance	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 2,200
<b>MONITORING WELLS O&amp;M</b>												
Mont. Equip. Maintenance	\$ -	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 2,000
subtotal:	\$ 17,600	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 35,200	\$ 369,600
<b>DWR LABOR</b>												
<b>GW Mont/Reporting</b>												
1. GW Levels	\$ 15,000	\$ 15,000	\$ 15,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 125,000
2. Permit Reporting	\$ 5,000	\$ 5,000	\$ 5,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 31,000
3. WQ Testing	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 33,000
<b>SW Monitoring</b>												
1. DCID Parshall	\$ -	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 9,000	\$ 90,000
2. Instream Flow Monitoring	\$ -	\$ 5,000	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,000
<b>Program Management</b>												
1. Overall Management	\$ 7,000	\$ 7,000	\$ 7,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 61,000
subtotal:	\$ 30,000	\$ 44,000	\$ 44,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 29,000	\$ 350,000
<b>DFG LABOR</b>												
<b>Fish Assessment</b>												
1. Labor/Benefits (Contract 2 PSMF)	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 186,000
2. Supplies/Reporting/Project Manag	\$ 5,000	\$ 10,000	\$ 8,000	\$ 8,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 66,000
subtotal:	\$ 5,000	\$ 37,000	\$ 35,000	\$ 35,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 252,000
<b>DCID LABOR ANNUAL PROGRAM MANAGEMENT</b>												
Program Management	\$ -	\$ 45,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 315,000
subtotal:	\$ -	\$ 45,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 315,000
<b>ANNUAL OM&amp;M:</b>	<b>\$ 52,600</b>	<b>\$161,200</b>	<b>\$144,200</b>	<b>\$129,200</b>	<b>\$114,200</b>	<b>\$ 1,286,600</b>						
											<b>OM&amp;M Ten-Year Total: \$ 1,286,600</b>	
<p>NOTE: 1. Annual Pumping Costs are considered to be an average annual cost over the 10-year period. Actual costs are unknown.                  2. The need for leasing an existing well is unknown. O&amp;M is based on lease price of \$20 per ac-ft. Actual price will be negotiated. Power costs for leased well are included in "Power Costs".                  3. If agreed to by all parties, groundwater monitoring and reporting would transfer to DCID at year 4.                  4. Potential Need for 1707 filling is unknown. Other methods for securing bypassed water will be analyzed and implemented first.</p>												

APPENDIX A  
Budgets

Table 2. Estimated Equipment and Materials Budget (Lump Sum Fund)

DEER CREEK FLOW ENHANCEMENT PROGRAM ESTIMATED LUMP-SUM START-UP COSTS	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	10-YEAR TOTAL
<b>EQUIPMENT, MATERIALS, START-UP EXPENSES (LUMP SUM BUDGET)</b>												
<b>DWR LABOR</b>												
CEQA Documentation												
1. Site Visits	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,000
2. Report Prep	\$ 3,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,000
Drilling Contract Oversight												
1. Drilling Contract Dev.	\$ 2,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,500
2. Well Drilling (2 prod wells)	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,000
3. Well Testing (2 prod wells)	\$ 2,500	\$ 2,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000
subtotal:	\$ 25,000	\$ 17,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 42,500
<b>DFG LABOR</b>												
CEQA Documentation												
1. Site Visits	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000
2. Report Prep	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000
subtotal:	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,000
<b>DCID START-UP COSTS</b>												
Well Easements (2 well sites)	\$ 8,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,000
CEQA Documentation	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000
Program Management (1st year)	\$ 60,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 60,000
subtotal:	\$ 118,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 118,000
<b>PRODUCTION WELLS (2 new, 1 existing)</b>												
1. Construction New Wells	\$250,000	\$250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000
2. Pump Bowls and Connection	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,000
3. Pump Motor and Panel	\$ 35,000	\$ 35,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 70,000
4. PG&E Power Connection	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 20,000
5. Discharge Turnout & Roadwork	\$ 9,000	\$ 9,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,000
6. Monitoring Equipment	\$ 5,000	\$ 2,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,500
7. Retrofitting Existing Well	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 20,000
8. Well Housings	\$ 2,000	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,000
9. Construction Contingency (5%)	\$ 16,800	\$ 16,675	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 33,475
subtotal:	\$352,800	\$350,175	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 702,975
<b>LUMP-SUM BUDGET BY YEAR:</b>	<b>\$505,800</b>	<b>\$367,675</b>	<b>\$ -</b>	<b>\$ 873,475</b>								
											<b>TOTAL LUMP SUM BUDGET:</b>	<b>\$ 873,475</b>
											<b>OM&amp;M Ten-Year Total (table 9):</b>	<b>\$ 1,286,600</b>
											<b>ANNUAL PROGRAM TOTAL:</b>	<b>\$ 2,160,075</b>
<b>NOTE:</b> 1. A Contingency of 5 percent was added to estimated production well costs.												

APPENDIX A

8-14-07

## APPENDIX B

### Deer Creek Irrigation District 2004 WUE Grant Revised Scope of Work

Funding for agricultural water use efficiency studies and improvements are funded through Section A and B of the Proposition 50 2004 Water Use Efficiency Grant. The main intent of the WUE improvement projects are to reduce system spillage and Deer Creek flow enhancement opportunities through improvements to DCID water diversion facilities and the ability to manage agricultural water distribution.

Section A of the WUE Grant includes funding to replace and automate main canal diversion gates, replace the canal diversion structure at the "Y", install a Supervisory Control and Data Acquisition (SCADA) system, and train the district water manager in its use. New water control structures along with SCADA technology will provide system operators with real-time information about flows, water levels and spillage from the system and the ability to remotely control Deer Creek diversions accordingly. Section B of the WUE Grant includes monitoring and assessment of the existing distribution system to provide estimate of the effectiveness of program improvements and recommendations for future work. A summary of Section A and Section B tasks are provided below.

#### **Section A Grant Tasks**

- Establish Easements and ROW
- Prepare Final Designs, Specifications & Contract Documents
- Conduct Project Bidding
- Construct Structures
- Procure and Install SCADA Equipment
- Provide Engineering Services During Construction
- Provide SCADA Training, Troubleshooting & On-call Support
- Conduct Project Monitoring & Assessment
- Conduct Outreach & Community Involvement
- Provide Project Management & Administration
- Permits and License

#### **Section B Grant Tasks:**

- Develop Project Mapping & Surveys
- Develop Project Mapping & Surveys
- Conduct Facilities Inventory
- Design & Implement Flow Monitoring Program
- Conduct Canal Seepage Investigations
- Assemble Water Balances
- Formulate & Compare Alternative Systems Improvement Programs
- Prepare Feasibility-Level Designs & Cost Estimates
- Environmental Compliance (provided in Sec. A work)
- Outreach & Community Involvement
- Project Reporting, Management and Administration

**Project Monitoring:**

The WUE Grant also includes monitoring and verification components to determine pre-project and post-project efforts.

**Pre-Project:** The 2006 monitoring efforts will concentrate mainly on two of the largest sites where spillage will be affected by the proposed near-term improvements. Additional locations where spillage is known to occur will be inspected and operators interviewed to be sure that other spillage sites are not overlooked.

**Post-Project:** Spillage monitoring will be continued in 2007 and beyond to support the five annual benefit/cost reports. This will provide a record of spillage with the efficiency improvements in place. Considering that the effectiveness of the proposed SCADA improvements depends somewhat upon operator skill and learning, a multi-year record is preferable to capture initial and ultimate project performance. Thus, monitoring will be continued through at least 2011 to capture this transition period and to provide the basis for the annual updates of project benefit/cost.

Conventional, proven methodologies will be used to measure, record and quality-control all targeted spillage flows. This will include use of standard measurement structures where possible, with a preference for broad-crested and sharp-crested weirs as primary flow measurement devices. Non-standard structures might also be employed, provided that reliable stage-discharge functions can be developed through current metering.

Because spillage tends to be highly variable with time, frequent observations are needed to compute reliable spillage volumes. Flow monitoring studies on other irrigation systems indicate that several measurements are required daily to adequately capture the variability in flow inherent to irrigation operations, especially spillage. The plan is to automate data recording at standard intervals of about 15 minutes, and in no case more than hourly. Sites will be visited weekly or biweekly to check for proper flow conditions and to swap out data loggers.

**WUE Project Deliverables:**

- Quarterly Progress Reports and associated documents
- Final Report and associated documents
- Any applicable engineering and permitting documents
- Annual Reports of Benefits & Costs for 5 years
- Construction Contract Documents
- Construction Technical Report
- Monitoring and Assessment Report

**WUE Project Budget:**

The WUE project was originally approved and funded as a collaborative project between Deer Creek Irrigation District (DCID) and Stanford Vina Ranch Irrigation Company (SVRIC). In May 19, 2005, the Stanford Vina Ranch Irrigation Company Board of Directors voted to withdraw from participating with DCID in the 2004 WUE Grant. Subsequently, DWR and DCID negotiated to fund only the DCID improvement portions of the original grant project.

Funding for the revised Section A and Section B budgets were approved for \$453,035 and \$172,850, respectively.

**WUE Project Timeline:**

Timeline for completion of the proposed grant activities is three years from the final award.

## APPENDIX C

### Groundwater Monitoring and Management Guidelines For the Deer Creek Flow Enhancement Program

#### INTRODUCTION

The following Groundwater Monitoring and Management Guidelines are included as part of the attached Agreement between DWR, DFG and DCID to enhance fish transportation flows in Deer Creek through utilization of groundwater in-lieu of bypassed surface water. The following guidelines establish a clear set of criteria for program monitoring, reporting and management and are similar to the management objectives use successfully during DCID's 2003 pilot program and the 2004 test-pumping program.

The overall management goals of the Deer Creek Irrigation District are to maintain the groundwater surface elevation at a level that will assure an adequate and affordable irrigation water supply, and to assure a sustainable supply of good quality groundwater for agricultural and domestic use. In order to maintain this goal, it is recognized that the operational criteria presented in the Groundwater Monitoring and Management Objectives may need to be adjusted as additional operational data for the program are established.

#### PROGRAM COORDINATION and INSTITUTIONAL AUTHORITY

Deer Creek Irrigation District is signatory to the Tehama County AB 3030 Groundwater Management Plan. The Tehama County AB 3030 Groundwater management Plan is administered by the Tehama County Flood Control and Water Conservation District (TCFCWCD). The TCFCWCD has established a Technical Advisory Committee (AB 3030 TAC) that serves as an advisory body to the TCFCWCD Board. The TCFCWCD Board and the AB 3030 TAC hold monthly meetings to implement the AB 3030 plan, and to develop policy on local groundwater management issues.

Tehama County also administers several groundwater-related ordinances. Chapter 9.4, "Aquifer Protection", of the Tehama County Code incorporates County Ordinance No. 1617. Tehama County Ordinance No. 1617 requires a permit to extract groundwater for the purpose of using or selling the water for use on lands other than the parcel from which the extraction occurs. Permitting authority of this ordinance is through the Tehama County Board of Supervisors (BOS), but administration of the permitting process is through the Tehama County Health Agency, Environmental Health Division (EHD). The EHD also oversees permitting associated with drilling and installation of all new wells.

With respect to operation, monitoring and reporting of DCID's groundwater pumping associated with the Deer Creek Flow Enhancement Program, primary coordination and reporting will be through the Tehama County EHD, via the Board of Supervisors. Secondary coordination at the

county level will be through the AB 3030 TAC, via the TCFCWCD. At the local level, coordination will be through the DCID Board, the Deer Creek Watershed Conservancy, and through stakeholder meetings associated with ongoing program operations.

During operation of the Deer Creek Flow Enhancement Program, a Deer Creek Water Advisory Committee (WAC) will be established. The WAC will help oversee the development and compliance of the program, interface with the local, county and State representatives, and work towards a more compressive groundwater management plan for the Deer Creek watershed.

The Deer Creek WAC will invite representatives from each of the following entities to participate.

- Deer Creek Irrigation District,
- Tehama County AB 3030 TAC,
- Tehama County Health Agency, EHD
- Northern District Department of Water Resources,
- California Department of Fish and Game,
- UC Davis Agricultural Extension Farm Advisor,
- Deer Creek Watershed Conservancy,
- Stanford Vina Ranch Irrigation Company, and
- Private groundwater users outside DCID and SVRIC area, but within the lower Deer Creek watershed area.

A Deer Creek WAC was developed during the 2003 Pilot Program and proved valuable for providing program input and dispensing information to local, county and state groups. Under the current program, it is anticipated that the WAC will initially meet monthly between April and October to discuss program operations and monitoring results. As the program develops it is envisioned that meetings will be limited and program status/updates will be provided electronically. Official reporting and annual program review associating with the permitting process for the Deer Creek Flow Enhancement Program will be coordinated directly with the Tehama County Health Agency EHD.

### **GROUNDWATER LEVEL CRITERIA**

One of the key criteria for program operations is maintaining a predetermined range of acceptable groundwater levels surrounding the program-related production wells. The acceptable range of groundwater level fluctuation during program operations was established based on historic groundwater level data, and the estimated worse-case decline in groundwater levels associated with previous test-production well pumping. The predetermined range of acceptable groundwater level fluctuation will be reviewed by the WAC and included as part of the Tehama County Groundwater Extraction Permit. Operation of the program production wells will proceed as long as there is compliance with the pre-agreed groundwater level criteria. The groundwater level monitoring location, timing, data reporting, acceptable range of fluctuation during program operations, and procedures for noncompliance determination, evaluation and program shutdown are presented below.

### **Groundwater Level Measurements**

The Department of Water Resources will be responsible for monitoring groundwater levels during the Deer Creek Flow Enhancement Program. Groundwater monitoring will include a regional County-wide grid, a regional Deer Creek monitoring grid, and a local Key Well grid. Tehama County typically also measures summer groundwater levels in portions of the regional County-wide grid.

### **Regional County-Wide Groundwater Level Monitoring Network**

DWR has maintained a groundwater level monitoring grid in Tehama County for over 50 years. Within this period, the annual size of the monitoring grid has fluctuated from as few as 3 wells in 1951, to about 128 wells in 2006. The County-wide groundwater level monitoring grid consists predominantly of domestic and irrigation wells, along with several dedicated multi-completion monitoring wells. The County-wide grid surrounds the Deer Creek Environmental Flow Enhancement Program on three sides and provides a good regional estimate of seasonal versus long-term groundwater level fluctuations.

### **Regional Deer Creek Groundwater Level Monitoring Network**

A regional groundwater level monitoring network for the lower Deer Creek area was developed in 1998 and 1999, and utilized in the 2003 and 2004 pumping program at DCID. The monitoring grid consists of dedicated multi-completion monitoring wells, as well as, a combination of surrounding domestic and irrigation wells. The grid includes all of DCID and SVRIC, extending from the Sacramento River to the eastern portion of DCID, and from Thomes Creek to Singer Creek. The regional groundwater level monitoring grid, along with the larger Tehama County groundwater monitoring grid, will be used to help identify seasonal trends and long-term fluctuations in groundwater levels at a regional scale.

### **Local Key Well Groundwater Level Monitoring Network**

Groundwater levels in key monitoring wells will be located adjacent to the program-related production wells and will be used to monitor compliance with the predetermined range of acceptable groundwater level fluctuation identified by the criteria below. Key monitoring wells will be selected by the WAC based on their construction, proximity to project wells, and their ability to represent groundwater levels in surrounding agricultural and domestic wells drawing from the upper Tuscan aquifer. Key groundwater monitoring wells were successfully utilized during the 2003 and 2004 pumping programs at DCID to help identify potential impacts to local water users from program-related pumping.

### **Frequency of Groundwater Level Measurements**

Monitoring frequency will vary depending upon monitoring well location and type, and the program operations schedule.

**During Periods of Non-Pumping:** During non-program operations, the depth to groundwater will be measured in all wells within the County-wide and Deer Creek regional monitoring grids at a minimum frequency of three times per year, and according to the following schedule.

- Spring: (March or April)
- Summer: (July or August)
- Fall: (October)

In addition to the above monitoring, during periods of non-program operations, the selected key wells and the dedicated multi-completion monitoring wells within the Deer Creek regional network will be equipped with automated groundwater level recording equipment. The automated equipment will be set to measure groundwater levels at a minimum frequency of six times per day. The data from this equipment will be downloaded a minimum of three times per year during non-pumping periods, according to the above schedule.

**During Periods of Program-Related Pumping:** During periods of program-related pumping, the depth to groundwater will be measured in the Deer Creek monitoring wells that are east of Highway 99, at a minimum frequency of once per month between April and October.

In addition to the above monitoring, during periods of program-related pumping, the selected key wells and multi-completion monitoring wells within the Deer Creek regional monitoring network will be equipped with automated groundwater level recording equipment. The automated equipment will be set to measure groundwater levels at a minimum frequency of twelve times per day. The data from this equipment will be downloaded once per month between April and October, and every three months from November through March.

#### **Acceptable Range of Groundwater Level Fluctuation During Program-Related Pumping**

The acceptable range of groundwater level fluctuation during program-related pumping will be determined for each key monitoring well. These ranges are based on static water level readings and were developed based on:

- review of the historic seasonal fluctuation of groundwater levels in domestic and agricultural wells surrounding the program-related production wells,
- the estimated program-related decline in groundwater levels in private wells surrounding the program production wells, and
- the ability of nearby third-party groundwater users to maintain an adequate and affordable supply of good quality groundwater for agricultural and domestic use.

In order to have adequate time to respond and make appropriate adjustments to program operations, the range limits are divided into a series of three warning stages. Each warning stage corresponds to a progressive increase in the decline in groundwater levels, and represents further movement towards noncompliance with the groundwater level criteria and eventual shutdown of program operations. Each warning stage also triggers a sequence of program management review and actions designed to alleviate any additional groundwater level decline.

### Definition of Groundwater Level Warning Stages

The groundwater level warning stages are based on static water level readings. The groundwater level data will be plotted on a hydrograph along with warning stage levels similar to those shown in Figure 1. The warning stages will be developed by the Deer Creek WAC and DCID, and are subject to approval by the Tehama County BOS through the permitting process under Tehama County Ordinance No. 1617. It is understood that adjustments to the warning stage criteria may be needed as data is collected during program operations. Procedures for adjustment to a warning stage will be similar to the initial development of the warning stage(s). Historic fluctuation in groundwater level in the Key wells will be used as a baseline for developing subsequent water stage levels.

Warning stages will be divided into three stages corresponding to three increasing levels of groundwater decline, with Stage 1 being the upper-most level and Stage 3 being the lowest level. The warning stages will be defined according to the following criteria.

- Stage 1 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 1 warning line.
- Stage 2 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 2 Warning line.
- Stage 3 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 3 Warning line.

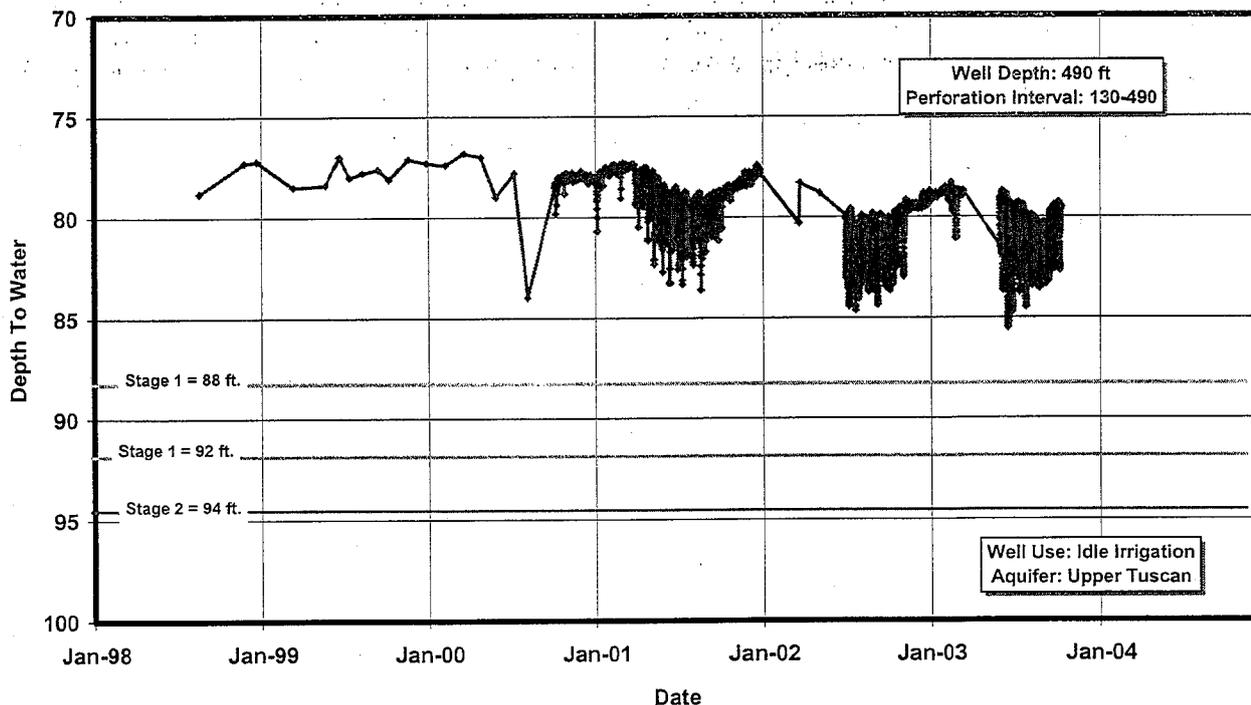


Figure 1. Example Key Well Hydrograph Showing Level Stages

Upon recommendation of the DCID Board and approval of the Tehama County BOS, a Stage 1 and Stage 2 Warning may be rescinded when the groundwater levels rise above the corresponding Stage 1 Warning Line in the non-compliant Key Well(s).

Upon recommendation of the DCID Board and approval of the Tehama County BOS, the Stage 3 Warning may be rescinded when the groundwater levels rise above the Stage 2 Warning Line in the non-compliant Key Well(s). A Stage 3 Warning may also be temporarily downgraded to a Stage 2 Warning if, after review of all of the groundwater level data, the affected landowners, the DCID Board, and the Tehama County BOS unanimously agree to the temporary groundwater level decline.

### **Evaluation for Compliance with Groundwater Level Criteria**

Following each monitoring period, the DWR will evaluate the groundwater level data for determination of compliance with the groundwater level criteria as stated in the Groundwater Management Objectives.

### **Compliance Reporting and Groundwater Level Data**

During periods of program-related pumping, the DWR will make groundwater level data available over the internet within 10 working days of each monitoring period. The data will provide Key Well hydrograph data and indicate compliance or non-compliance with warning stage trigger levels.

If wells are found to be in noncompliance with the groundwater level criteria, a noncompliance report will be submitted by the DWR to the Deer Creek WAC, the DCID Board, and the Tehama County EHD within 7 days of the last monitoring period. The noncompliance report will include information as to the regional extent and magnitude of the noncompliance and the character of the compliance violation (Stage 1, 2 or 3 Warning Level).

### **Response Action for Noncompliance with Groundwater Level Criteria**

A series of response actions for each warning level are listed below. The intent of the following list is to provide a minimum level of required response actions, thereby maintaining flexibility for further action, as needed and appropriate, to maintain the general program goals of sustaining the groundwater resource while minimizing third-party impacts. Therefore, the magnitude and extent of possible response actions shall not be limited to those identified below:

**Stage 1 Warning** - Stage 1 response actions shall include measuring groundwater levels and reassessing the appropriateness of the GMO groundwater level criteria with respect to the given circumstances. DWR shall collect and present all pertinent hydrological data to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate possible causes for the noncompliance, and develop recommend actions to resolve the Stage 1 noncompliance. These recommendations shall be made in a timely manner not to exceed 7 days after the reporting of the Stage 1 noncompliance. It shall be the intent of the review group to first make recommendations that focus on resolving the noncompliance through management actions and negotiations with all parties in the affected area. Additional action to help identify the cause for the noncompliance

may include, but not be limited to, increasing the frequency of groundwater monitoring and re-assessing the existing appropriateness of the groundwater level criteria.

**Stage 2 Warning** - Stage 2 response actions shall include more extensive monitoring and evaluation of the GMO groundwater level criteria with respect to the given circumstances. DWR shall collect and present all pertinent hydrological data to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate possible causes for the noncompliance, and develop recommend actions to resolve the Stage 2 noncompliance. These recommendations shall be made in a timely manner not to exceed 7 days after the reporting of the Stage 2 noncompliance. Depending upon the circumstances surrounding the Stage 2 noncompliance, actions at this time could include shutting down the pilot program well if a Stage 3 noncompliance appears imminent. If the progression of groundwater levels towards a Stage 3 noncompliance appears slow or unlikely, other operational management methods may be implemented to avoid further decline of groundwater levels. The methods may include, but not be limited to, partial shutdown of the pilot well during periods of peak interference with surrounding pumping wells, reduction in the volume of daily groundwater extraction from the pilot well, or voluntary water conservation measures. Implementation of Stage 2 management actions may require action by the Tehama County BOS.

**Stage 3 Warning** - Stage 3 management actions shall consist of terminating program-related groundwater pumping and collecting groundwater level recovery data in the surrounding monitoring wells. Groundwater level recovery data will be collected by the DWR and presented to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate the recovery from Stage 3 noncompliance levels, and develop recommend actions as to further program operation.

### **Supporting Data**

When possible, groundwater level and groundwater quality data from surrounding Tehama County areas will be used to support evaluation of existing conditions in the DCID area.

## **GROUNDWATER QUALITY CRITERIA**

Maintaining a minimum level of acceptable water quality from the pilot program pumping well is the second criteria for program operation. The water quality criteria will require that groundwater from the program-related production wells will be maintained within the recommended Maximum Contaminant Level (MCL) established for agricultural use in the United States by the Food and Agriculture Organization of the United Nations. For some minerals and nutrients, no agricultural MCL's have been established. In these situations, water quality from the program-related production wells will be maintained at level that is equal to, or better than, the existing quality of surface water that is currently being diverted. The water quality standards for agriculture are listed in Table 1.

The range of acceptable groundwater quality will be reviewed by the Deer Creek WAC and supported by the DCID Board. Operation of the groundwater pumping program will proceed as

long as there is compliance with the pre-agreed to groundwater quality criteria. The location and frequency of groundwater quality monitoring, the reporting of the data, and management action for noncompliance are presented below and is based on previous water quality monitoring conducted during the 2003 and 2004 pilot well programs which indicated that the quality of water from the lower Tuscan aquifer is of high quality.

### Key Water Quality Monitoring Sites

Three key water quality monitoring sites will be selected at each of the program-related production well locations. The sites will be located as follows:

- Site 1: Sample and test surface water quality in the distribution system, above the point where groundwater from the program well(s) discharge into the system.
- Site 2: Sample and test the groundwater quality as it discharges from program well(s).
- Site 3: Sample and test the surface water quality in the distribution system below the point where groundwater from the program well(s) discharges into the system.

### Water Quality Sampling and Testing

The Department of Water Resources will be responsible for field collection and testing of surface and groundwater quality samples. Analytical testing will be conducted at a State of California approved laboratory and will include analysis for minerals, trace metals and nutrients. Minerals analysis will include testing for conductivity, pH, temperature, alkalinity, total dissolved solids, total hardness, boron, calcium, chloride, magnesium, potassium, sodium and sulfate. Trace metal analysis will include testing for aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium and zinc. Nutrient analysis will include testing for ammonia, dissolved orthophosphate, nitrite, nitrate, and total phosphorus.

<b>Parameter</b>	<b>Aluminum</b>	<b>Arsenic</b>	<b>Boron</b>	<b>ASAR<sup>2</sup></b>	<b>Cadmium</b>	<b>Chloride</b>	<b>SC<sup>3</sup></b>	<b>TDS<sup>4</sup></b>
<b>Ag. MCL<sup>1</sup> (mg/l)</b>	5.0	0.1	0.7	< 3	0.01	106	0.7	450
<b>Parameter</b>	<b>Manganese</b>	<b>Copper</b>	<b>Nickel</b>	<b>Iron</b>	<b>Selenium</b>	<b>Lead</b>	<b>Zinc</b>	
<b>Ag. MCL<sup>1</sup> (mg/l)</b>	0.2	0.2	0.2	0.3	0.02	5.0	2.0	
1. MCL = Agricultural Maximum Contaminant Level 2. ASAR = Adjusted Sodium Absorption Ratio 3. SC = Specific Capacity measured in micro-mhos/cm 4. TDS = Total Dissolved Solids								

**Table 1. Agricultural Water Quality Standards Established by Food and Agriculture Organization of the United Nations.**

### Frequency of Water Quality Monitoring

Based on the 2003 and 2004 data indicating that the quality of water from the lower Tuscan aquifer was of high quality, sampling for the future program will be collected once from

the three above indicated sites, at each production well location, within 5 days of the start of the test-production well pumping and once within 5 days of the conclusion of the pumping. In addition, field measurements of electrical conductivity will be conducted monthly at similar locations. Following each monitoring period, the DWR will evaluate the surface and groundwater water quality data for compliance with the MCL's for agricultural use as listed in Table 1.

#### **Compliance Reporting of Water Quality Data**

During program operations, the DWR will provide the analytical results from the water quality testing over the Internet within 10 days of receiving the data from the lab, and within 7 days of the monthly field sampling date. In addition, status reports will be provided to the Deer Creek WAC, the Tehama County EHD, and the Tehama County AB 3030 TAC. Each report will provide a comparison of recently measured water quality data against the agricultural MCL's.

#### **Response Action for Noncompliance with Water Quality Criteria**

If water quality data exceeds the recommended agricultural standards presented in Table 1, DWR will submit the information to the DCID Board, the EHD and the Tehama County AB 3030 TAC along with recommend actions to improve water quality. The recommended corrective actions will vary depending upon which water quality parameters are exceeding the agricultural MCL. Corrective actions may include, but not be limited to, mixing of poor quality water with water of a higher quality, treatment of the poor quality water or termination of pumping from the pilot well.

### **ANNUAL REPORTING**

An annual report will be prepared in the fall at the conclusion of the program-related groundwater pumping. The annual report will summarize the status of groundwater levels and water quality for the DCID project area over the past year, compliance or non-compliance with groundwater management objectives of the pilot water exchange program, evaluation of program operations, and recommendations for improvement.

**APPENDIX D****Deer Creek Fish Passage Assessment Plan  
For the  
Deer Creek Flow Enhancement Program**

Prepared by the California Department of Fish and Game  
March 29, 2006

The California Department of Fish and Game (DFG) and Deer Creek Irrigation District (DCID) recognize the need for a long-term solution to fish transportation issues in Deer Creek and are working towards a phased development of a Deer Creek Flow Enhancement Program. The intent of the Flow Enhancement Program is to augment fish transportation in Deer Creek by developing a supplemental water supply and implementing water use efficiency improvements. These measures are anticipated to provide between 15 and 18 cfs of flow for spring-run Chinook salmon (SRCS), fall-run Chinook salmon (FRCS) and Steelhead trout. DCID will be reimbursed with supplemental water in the amount equal to that bypassed for fish transportation flow. This Fish Passage Assessment will monitor fish passage conditions over a range of water year types to determine the timing and effectiveness of the Deer Creek Flow Enhancement Program operations.

**Background**

To date, no flow studies specific to the unique hydrology of Deer Creek have been completed to determine timing and duration of minimum and optimal bypass flows for adult salmon and steelhead migration. For the purposes of initially estimating the annual volume and timing of the Deer Creek Flow Enhancement Program, a preliminary estimate of 50 cfs has been chosen for fish transportation needs. To better refine transportation requirements of adult salmon, the fish flow objectives addressed in this plan are:

1. What is the sustained flow for unimpaired fish passage from the Sacramento River past Stanford Vina Ranch Irrigation Company (SVRIC) Dam?
2. In the absence of unimpaired sustained flow, will a Pulse Flow trigger fish movement?
3. In the absence of unimpaired sustained flow, will a combination of minimum sustained flow and riffle modification pass fish?
4. When and for how long are bypassed flows needed to move fish?

This fish passage assessment will focus on determining the appropriate habitat conditions to insure unimpaired migration. The techniques used to assess these habitat conditions will include salmon occurrence surveys, identification and measurement of critical riffles, identification and mapping of braided channels, and water temperature monitoring.

## Measuring Fish Passage

The 4.9 mile section of Deer Creek between SVRIC dam and the confluence with the Sacramento River will be assessed using a combination of stream channel monitoring and salmon occurrence surveys (Figure 1). Spring surveys will be made April, May, and June and will commence once post-diversion flows are  $\leq 100$ cfs. Fall surveys will start in mid-October once water temperatures can support spawning salmon and continue for a 2 week period.

Channel characteristics of riffles successfully passing fish will be compared with riffles causing fish stranding. A combination of ground and underwater observation techniques and fish ladder counts will be used to determine the occurrence of adult salmon and evidence of fish stranding. In the spring months riffles will be monitored starting at 100cfs and will continue until water temperatures create a thermal barrier, or adult salmon are no longer observed. Measurement of channel characteristics of critical riffles successfully passing salmon will be used to determine relationships between stream discharge, riffle depth characteristics, and fish occurrence.

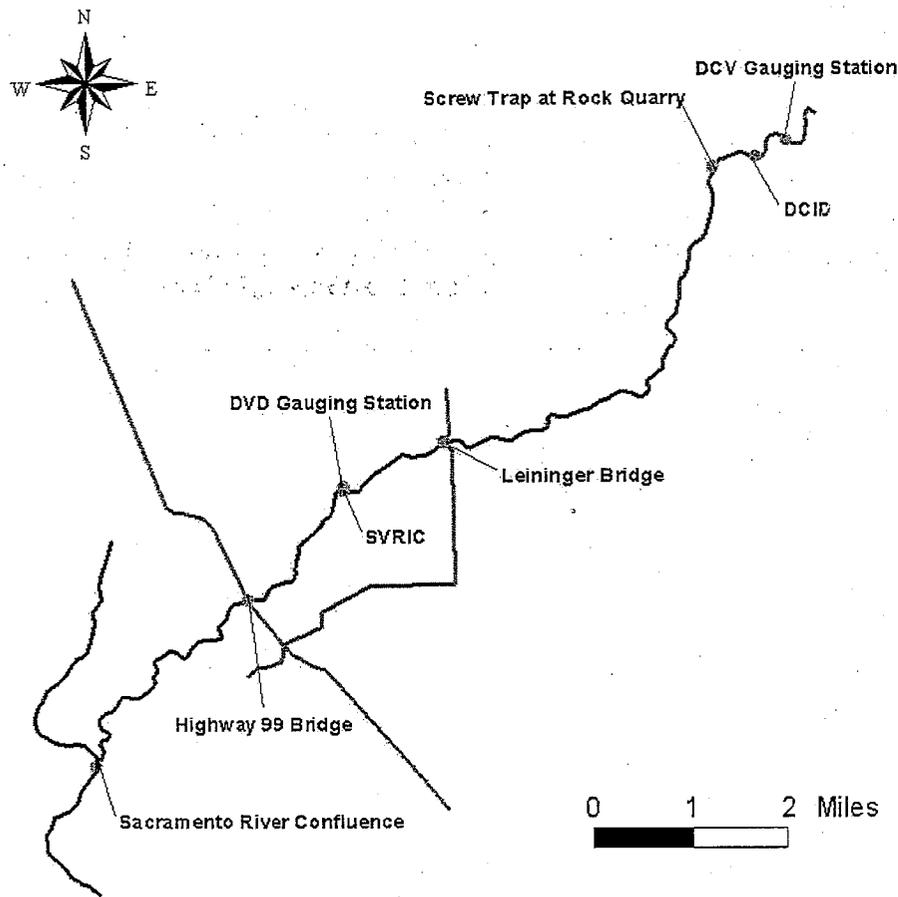


Figure 1. Deer Creek Fish Passage Assessment Study Area

## Pulse Flows

Upon mutual consent of DCID, DFG and the California Department of Water Resources (DWR), DFG may request that DCID bypass diversions greater than the instantaneous capacity (realized thru Project wills and WUE improvements) for a pulse flow rather than a continuous flow. If additional flows are needed, DCID may provide a pulse flow of up to approximately 30 cfs for a period of one or two days. Actual bypass flow will be based on DFG's recommendations utilizing concurrent assessment of surface water temperatures and critical riffle transportation flow need. Pulse flows are not recommended in the fall of the year due to the spawning potential downstream of Stanford Vina Ranch Irrigation Company (SVRIC) dam and possible salmon or redd stranding once sustained flows resume.

If adult salmon are observed between SVRIC dam and the confluence of Deer Creek with the Sacramento River, an enhanced one or two day pulse flow may be used to attract salmon upstream of SVRIC Dam if the following conditions occur:

- As maximum daily water temperatures reach 65°F to 70°F as measured at DWR's Deer Vina Dam (DVD) gage below SVRIC dam
- Critical riffles reach the minimum critical passage depths

Likewise, if juvenile salmon and steelhead are observed in lower reaches of Deer Creek in the end of June when bypassed flows may no longer be requested for adult fish passage, a pulse flow may be requested to trigger outmigration.

Lower Deer Creek is considered a migration corridor for immigrating SRCS and these fish are not utilizing this area for holding habitat or long-term resting pools. Consequently a pulse flow of up to 2 days should provide adequate time for fish to migrate past diversion dams. Studies in other rivers show that SRCS migrate upstream at rates between 6-18 miles/day early in the migration season and maximum rates of 31 miles/day later in the migration season. Applying these migration rate criteria to Deer Creek, (assuming unimpeded flows over critical riffles and no thermal inhibitors), yields passage rates of 4 to 19 hours to pass the lower dam and 6 to 29 hours to pass the upper dam. As shown in Table 1, a 1-2 day pulse flow (24-48 hours) should facilitate movement upstream of water diversions.

Distance from confluence:		Travel Time	
		SVRIC Dam (4.9 miles)	DCID Dam (7.4 miles)
Early season rates	6.2 mi/day	19 hours	28.6 hours
	18.3 mi/day	6.5 hours	9.7 hours
Late season rate	31 mi/day	3.8 hours	5.7 hours

**Table 1. Estimated migration rates for adult salmon in Deer Creek between the confluence and DCID upper dam.**

Before and after pulse flow events, visual observations (including ground surveys, underwater surveys and fish ladder counts) will be used to evaluate the effectiveness of pulses of water in triggering adult and juvenile fish movement, including evaluation of diurnal timing of pulse release and experimental ramp down rates.

### Riffle Modification

In some instances, a riffle or braided channel may require more flow for unimpaired passage than is available to be bypassed. If fish surveys find evidence of adult salmon stranding caused by a barrier condition and extra flows are not available for a pulse flow event, the potential of mechanically modifying a riffle to afford fish passage will be evaluated. Each riffle modification proposal and post-project evaluation will include measurements of streambed elevation, water depth and stream velocity. All proposed modifications will be discussed with affected landowners. Although it is not the intent of this program to annually modify riffles as a substitute for providing adequate passage flows for salmon, it is recognized that concurrent with changing channel conditions, bypass needs for unimpeded passage may also change. A program that occasionally modifies a critical passage area will assist with providing salmon access into Deer Creek in situations when extra bypass flow is not available.

### Water Temperature Standards

Since adult Chinook salmon are less tolerant of thermal stress than juvenile salmon, temperature tolerance criteria for adult Chinook will be used for setting temperature standard for all life-stages of salmonids in lower Deer Creek. These temperature standards will be used in determining the effects of flow reduction and flow augmentation, the duration of fish migration, the cessation of bypass flows in early summer and the beginning of bypass flows in the fall.

In order to determine upper optimal temperature ranges and maximum temperature tolerance levels for immigrating SRCS, a literature review was made of temperature studies on Chinook salmon. The following table represents a generalized temperature tolerance regime for adult Chinook salmon.

Tolerance Levels	Maximum daily average of 7 days
Upper optimal temperature range	57.7°F to 62.2°F
Acute (short-term) exposure	68°F to 69.8°F (single daily maximum)
Upper migration limit	70°F
Resuming migration	66°
Lethal	≥72°F
Upper limit for spawning FRCS	57.5°F

**Table 2. Adult Chinook salmon immigration temperature tolerances.**

For the purposes of establishing temperature tolerance criteria for immigrating Deer Creek SRCS, the following **maximum daily water temperatures** will be used:

- Prolonged exposure to 70°F or greater will be considered lethal
- Salmon will presume to migrate up to 70°F. At 70°F will salmon presumably halt migration and resume movement when temperatures cool to  $\leq 66^{\circ}\text{F}$ .

Water temperature will be measured pre-diversion at the United States Geological Surveys' (USGS) Deer Vina Dam (DCV) stream gage and post-diversion at the DVD gage. Portable water temperature monitors will be installed between DCID and SVRIC diversions.

A weekly rolling average of maximum daily water temperatures in conjunction with monitoring for salmon occurrence will be used to predict when SRCS migration has ceased in early summer and when FRCS will begin migration in the fall. Using a combination of established USGS temperature gages and portable temperature monitors, when the 7-day arithmetic average of the daily maximum temperature values exceeds 70°F, it will be assumed that SRCS migration has ceased for the season. When this criteria has been reached DFG will notify DCID and DWR. Conversely, bypass flows will be requested for FRCS when the 7-day average of the daily maximum water temperature declines below 57.5°F. A fall flow release will be arranged by mutual consent of DCID, DFG, and DWR. Once fall flows commence, they must be maintained for the duration of salmon spawning and egg incubation.

### Time Line

The following chart shows the anticipated timeline for data collection and assessment for this program.

Activity	Years 1 - 10					
	Apr	May	Jun		Oct	Nov
Water temperature monitoring	✓	✓	✓			✓
Channel and riffle assessment	✓	✓	✓			✓
Salmonid occurrence surveys	✓	✓	✓			✓
Develop long-term monitoring plan	Jan-Mar of 3 <sup>rd</sup> year					

Years 1-3 will be used to define riffle depth criteria, recommended channel profiles and minimum instream flows. Field monitoring efforts in years 4-10 will be reduced by approximately 50% and will concentrate on implementing the fish passage criteria determined from the programs initial 3 years.

### Budget

Four-Pumps will contract with Pacific States Marine Fisheries Commission (PSMFC) to hire Fishery Technicians. These Technicians will be selected and trained by DFG. DFG will provide an Associate Fishery Biologist as project lead. DFG will be responsible project management and coordination between landowners and DCID.

For field assessment during years 1-3, DFG will employ 2 PSMFC Technicians for a total of 3 months in April, May, June and a 2 week period in October and November. In years 4-10, Technicians will be used a total of 1.5 months during the same time periods. Total cost for 10 years of assessment will be \$247,000. Table 3 shows the annual cost and total budget for these 10 years of monitoring. DFG will supply an in-kind funding match to this program by providing an Associate Biologist for project management and reporting, transportation costs to Deer Creek, and stream survey equipment. The total value of DFG's 10-year in-kind match will be \$201,500. Table 4 shows the total DFG funding match for the 10 years of the program. The entire 10-year cost of this Fish Passage Assessment is \$448,500.

PSMFC Labor	Start Up	Year 2	Year 3	Years 4-10
1. Labor/Benefits (2 PSMFC technicians)	\$27,000	\$27,000	\$27,000	\$15,000 annually
2. Supplies/Reporting/PSMFC Project Management	\$10,000	\$8,000	\$8,000	\$5,000 annually
subtotal	\$37,000	\$35,000	\$35,000	\$20,000 annually
Project Total				\$247,000

**Table 3. 10-year budget for Fish Passage Assessment component of Deer Creek Flow Enhancement Program.**

DFG Labor	Years 1-3	Years 4-10
1. DFG Project Management	\$25,000	\$12,500 annually
2. Field supplies and Transportation	\$6,000	\$3,000 annually
subtotal	\$31,000 annually	\$15,500 annually
In Kind Match Project Total		\$201,500

**Table 4. DFG in-kind match for 10-year Fish Passage Assessment component of Deer Creek Flow Enhancement Program.**

## Reporting

A fish assessment template for anadromous fish instream flow needs in lower Deer Creek will be prepared after the initial three years of the program. This template will include:

- a. Recommendations for minimum in-stream flows needed for unimpaired passage of adult salmon between the Sacramento River and SVRIC Dam.
- b. Recommendations on the seasonal duration of bypass flow periods based on maximum daily water temperatures and fish occurrence surveys.
- c. Minimum riffle depth criterion and recommended channel profiles to pass fish at recommended minimum flows.
- d. Criteria for critical riffle modification.

- e. Criteria for the timing, frequency and duration of pulse flows.
- f. Anticipate frequency of this program based on assessment results and historical hydrographs.
- g. Sampling protocol and revised projected budget for years 4-10 of the Deer Creek Fish Passage Assessment Plan.

### **Stream Access Permission**

The additional flow provided by this Environmental Flow Program will be bypassed at the DCID dam. Flow conditions between DCID and SVRIC diversions do not impede fish passage. It is the post-diversion flow section of Deer Creek, downstream of both DCID and SCRIC diversions, which will benefit from this bypassed flow. DFG has not obtained permission for land access between SVRIC dam and Deer Creeks' confluence for the purposes of this Assessment Plan. Likewise, permission has not been obtained for potential riffle modification activities. If access permission cannot be obtained at the onset of this program, objectives will not be completed as outlined.

### **Other fish monitoring in the Watershed**

Additional monitoring by DFG in Deer Creek which may benefit this Assessment Plan includes annual SRCS and FRCS population counts and juvenile salmon outmigrant monitoring. Adult SRCS and FRCS population numbers will be used in this assessment to compare annual escapement levels with unimpaired passage flows. (Although, using salmon escapement numbers to justify program effectiveness cannot be verified with the proposed sampling methodologies.) The rotary screw trap monitoring will be used in this assessment to predict the occurrence of juvenile Chinook and Steelhead trout in lower Deer Creek during the months of May, June and late October. These monitoring activities are funded through existing DFG contracts.