CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ADMINISTRATIVE CIVIL LIABILITY ORDER NO. R5-2008-0593
IN THE MATTER OF

THE CITY OF CHICO
CHICO WATER POLLUTION CONTROL PLANT
BUTTE COUNTY

This Order is issued to the City of Chico (hereafter referred to as Discharger) pursuant to California Water Code (CWC) section 13385, which authorizes the imposition of Administrative Civil Liability (ACL). This Order is based on findings that the Discharger violated provisions of Waste Discharge Requirements (WDRs) Order No. R5-2004-0073 (NPDES No. CA0079081).

The Executive Officer of the Central Valley Regional Water Quality Control Board (hereafter Central Valley Water Board) finds, with respect to the Discharger's acts, or failure to act, the following:

1. The Discharger owns and operates the Chico Water Pollution Control Plant (CWPCP), which provides sewerage service to the community of Chico. Treated municipal/industrial wastewater is discharged to the Sacramento River, a water of the United States.

2. On 4 June 2004, the Central Valley Water Board adopted WDR Order No. R5-2004-0073, to regulate discharges of waste from the CWPCP.

3. On 17 March 2008, the Assistant Executive Officer issued the Discharger Administrative Civil Liability Complaint No. R5-2008-0509 (Complaint), which charged the Discharger with Administrative Civil Liability in the amount of $100,000, pursuant to CWC section 13385. The amount of the liability for the discharge violations was established based upon a review of the factors cited in CWC section 13385 and the State Water Resources Control Board (State Water Board) Water Quality Enforcement Policy, as set forth in Finding No. 27.

PREVIOUS ENFORCEMENT ACTIONS

4. On 15 May 2007, the Central Valley Water Board adopted ACL Complaint No. R5-2007-0512. Pursuant to CWC section 13385(h), a mandatory penalty of $3,000 was imposed due to effluent chlorine residual violations from an incident on 9 December 2006. The complaint indicated that approximately 388,180 gallons of effluent, which was not properly chlorinated and /or dechlorinated, was discharged to the Sacramento River due to electrical power problems with the chemical feed supply system. The Central Valley Water Board has accepted payment from the Discharger of the penalty associated with ACLC No. R5-2007-0512, and considers this prior matter resolved.

5. On 19 July 2005, the Central Valley Water Board issued ACL Complaint No. R5-2005-0520. Pursuant to CWC section 13385(h), a mandatory penalty of $9,000

was imposed due to effluent chlorine residual violations from several incidents that occurred on 14 March 2004, 24 July 2004, and 16 March 2005. The complaint indicated that effluent, which was not properly chlorinated and /or dechlorinated, was discharged to the Sacramento River due to electrical and mechanical failures with the chemical feed supply system. The Central Valley Water Board has accepted payment from the Discharger of the penalty associated with ACLC No. R5-2005-0520, and considers this prior matter resolved.

6. On 19 February 2004, the Central Valley Water Board issued ACL Complaint No. R5-2004-0500. Pursuant to CWC section 13385(h), a mandatory penalty of $15,000 was imposed due to effluent chlorine residual violations from several incidents that occurred on 16 October 2002, 5 April 2003, 1 May 2003, 7 November 2003, and 29 January 2004. The complaint indicated that effluent, which was not properly chlorinated and /or dechlorinated, was discharged to the Sacramento River due to electrical and mechanical failures with the chemical feed supply system. The Central Valley Water Board has accepted payment from the Discharger of the penalty associated with ACLC No. R5-2002-0500, and considers this prior matter resolved.

7. On 24 July 2002, the Central Valley Water Board issued ACL Complaint No. R5-2002-0515. Pursuant to CWC section 13385(h), a mandatory penalty of $9,000 was imposed due to effluent chlorine residual violations from several incidents that occurred on 24 January 2002, 25 January 2002, and 30 June 2002. The complaint indicated that effluent, which was not properly chlorinated and /or dechlorinated, was discharged to the Sacramento River due to mechanical and electrical failures with the chemical feed supply system. The Central Valley Water Board has accepted payment from the Discharger of the penalty associated with ACLC No. R5-2002-0515, and considers this prior matter resolved.

8. On 29 November 2000, the Central Valley Water Board issued ACL Complaint No. R5-2000-0528. Pursuant to CWC section 13385(h), a mandatory penalty of $6,000 was imposed due to effluent chlorine residual violations from several incidents that occurred on 1 January 2000 and 28 February 2000. The complaint indicated that effluent, which was not properly chlorinated and /or dechlorinated, was discharged to the Sacramento River due to mechanical and electrical failures with the chemical feed supply system. The Central Valley Water Board has accepted payment from the Discharger of the penalty associated with ACLC No. R5-2000-0528, and considers this prior matter resolved.

DISCHARGE VIOLATIONS

9. WDRs Order No. R5-2004-0073 contains the following Discharge Prohibition that was violated by the Discharger by discharging the partially-treated wastewater to the Sacramento River:

Discharge Prohibition A.1:

1. *Discharge of treated wastewater at allocation or in a manner different from that described in Findings Nos. 2, 3 and 4 is prohibited*.

10. WDRs Order No. R5-2004-0073 contains the following effluent limitations that were violated by the Discharger by discharging the partially-treated wastewater to the Sacramento River:

Effluent Limitation B.1:

1. *Effluent shall not exceed the following limits at Discharge 001:*

Constituents	*Units*	*Monthly Average*	*Weekly Average*	*Monthly Median*	*4-day Average*	*Daily Maximum*
Chlorine Residual	*mg/L*	*--*	*--*	*--*	*0.01*	*0.02[c]*

[c] 1-hour average

11. On 21 August 2007, effluent chlorine residual concentration was measured at 3.0 mg/L. The daily maximum chlorine residual is 0.02 mg/L. Approximately 514,000 gallons (volume of chlorine contact basin) was discharged to the Sacramento River with an average 3.0 mg/L of residual chlorine. Additionally, approximately 2.486 million gallons of effluent was discharged to the Sacramento River, which was secondary treated effluent without chlorination/dechlorination.

12. The cause of the 21 August 2007 violation was a result of a blown fuse in an Uninterruptible Power Supply (UPS) unit during off-hours of the plant operation. The UPS powers a Programmable Logic Controller (PLC) that controls the chemical feed pumps. The power loss caused the chemical feed pumps to shut down. The Supervisory Control and Data Acquisition (SCADA) system did indicate an alarm condition, however, the system failed to send the alarm information to the on-call plant personnel.

13. On 4 September 2007 effluent chlorine residual concentration was measured at 2.38 mg/L. The daily maximum chlorine residual is 0.02 mg/L. Approximately 123,963 gallons was discharged to the Sacramento River with an average chlorine residual of 2.38 mg/L.

14. The cause of the 4 September 2007 violation was a result of a ground fault (electrical short) that occurred when the power was turned back onto to a slide gate at Chlorine Contact Basin No. 2. The electrical short blew fuses in the two UPS units that power the chemical feed pump PLC, the sodium hypochlorite pumps, and the sodium bisulfite pumps. Upon discovery of the alarm, the plant operators immediately diverted effluent discharge from the Sacramento River to the onsite emergency storage ponds.

15. On 4 October 2007, staff issued a Notice of Violation (NOV) to CWPCP indicating that the violations described above are subject to further enforcement actions, including the assessment of administrative civil liability (a monetary fine).

16. In the past seven years, there have been approximately sixteen separate effluent violations of residual chlorine. Out of the sixteen events, eleven of the events have been related to electrical failure problems with the chemical feed system electronics. There have been a total of $42,000 mandatory minimum penalties assessed during the last seven years.

17. In summary, during August and September 2007, the Discharger violated the total residual chlorine effluent limitations set forth in Effluent Limitations B.1 for 637,963 gallons, and violated Discharge Prohibition A.1 for 2.486 million gallons of effluent (not properly chlorinated/dechlorinated). A total of approximately 3.124 million gallons of partially treated secondary treated effluent were discharged to the Sacramento River in violation of Board Order No. R5-2004-0073.

REGULATORY CONSIDERATIONS

18. Discharge Prohibition A.1 of Order No. R5-2004-0073 states: *"Discharge of treated wastewater at allocation or in a manner different from that described in Findings Nos. 2, 3 and 4 is prohibited".* Finding No. 4 states "*The treatment system consists of … and chlorination/dechlorination."*

19. Effluent Limitation B.1 of Order No. R5-2004-0073 states: '*Effluent shall not exceed 0.02 mg/L chlorine residual as a 1-hour average."*

20. As described in the above Findings, the Discharger has violated Order No. R5-2004-0073 by violating the effluent limitations and by discharging waste to surface waters without the proper treatment, which would include chlorination and dechlorination.

21. Section 301 of the Clean Water Act and CWC section 13376 prohibit the discharge of pollutants to surface waters except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.

22. CWC section 13376 states, in part:

"Any person discharging pollutants or proposing to discharge pollutants to the navigable waters of the United States ... shall file a report of the discharge in compliance with the procedures set forth in Section 13260..." and "The discharge of pollutants…except as authorized by waste discharge requirements [NPDES permit]…is prohibited."

CALCULATION OF PENALTY FOR DISCHARGE VIOLATIONS

23. CWC section 13385 states, in part:

"(a) Any person who violates any of the following shall be liable civilly in accordance with subdivisions (b), (c), (d), (e), and (f):

….

(1) Section 13375 or 13376."

…

"(c) Civil liability may be imposed administratively by the state board or a regional board pursuant to Article 2.5 (commencing with Section 13323) of Chapter 5 in an amount not to exceed the sum of both the following:

(1) Ten thousand dollars ($10,000) for each day in which the violation occurs.

(2) Where there is a discharge, any portion of which is not susceptible to cleanup or is not cleaned up, and the volume discharged but not cleaned up exceeds 1,000 gallons, an additional liability not to exceed ten dollars ($10) times the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons."

24. For discharging waste to surface waters in violation of the Order, the Central Valley Water Board may assess administrative civil liability based on CWC section 13385. The maximum administrative civil liability which can be imposed by the Central Valley Water Board under CWC section 13385 is $10,000 per day of discharge plus $10 per gallon discharged in excess of 1,000 gallons not subject to clean up. As stated in the Findings, the Discharger estimates that a total of 637,963 gallons of secondary treated wastewater discharged exceeded the residual chlorine effluent limitation, and that approximately 2.486 million gallons of undisinfected secondary treated wastewater were discharged to the Sacramento River on 21 and 22 August and 4 September 2007. Therefore, the maximum administrative civil liability is $30,000 (3 days times $10,000 per day) plus $31,219,630 (3.124 million gallons minus 1,000 gallons not subject to cleanup $10 per gallon), for a total maximum liability of **$31,249,630**.

25. CWC section 13385(e) states:

"*In determining the amount of any liability imposed under this section, the regional board, the state board, or the superior court, as the case may be, shall take into account the nature, circumstances, extent, and gravity of the violation or violations, whether the discharge is susceptible to cleanup or abatement, the degree of toxicity of the discharge, and, with respect to the violator, the ability to pay, the effect on its ability to continue its business, any voluntary cleanup efforts undertaken, any prior history of violations, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters that justice may require. At a minimum, liability shall be assessed at a level that recovers the economic benefits, if any, derived from the acts that constitute the violation*."

26. Pursuant to CWC section 13385(e), the minimum administrative civil liability for a discretionary penalty is equivalent to the economic benefit accrued by the Discharger for not implementing management and physical improvements necessary to prevent the discharges. The 3.124 million-gallon discharges were the result of the Discharger's failure to provide adequate control measures to prevent electrical shortages to the chemical storage facility and/or properly notifying plant personnel of effluent violations

by the SCADA system. It is estimated that if site personnel were onsite during the peak flow periods, they would have been able to divert the flow of effluent to the three-holding/oxidation ponds instead of the Sacramento River. If any personnel were at the site (non-operators), they could have called the on-call operators to trouble-shoot the violation in a timely matter. It is estimated that the Discharger may have saved at least **$79,968** by not taking the actions required to prevent the violations described in this Complaint. This savings is based on a cost estimate of providing for personnel during the non-working hours of the CWPCP (5:00 pm to 7:00 am). Cost estimates have been obtained from a private security service, which indicates an annual salary of approximately $79,968 ($17.00/hr x 14/hrs/day x 7 days/wk) for a security guard to be at the plant to be able to physically make out calls to waste water plant operators when alarm conditions occur. This would be a backup to the existing SCADA system, which has not correctly provided call-outs during the past residual chlorine violations. Additionally, the Discharger has provided information that it has hired an electrician ($90,000/yr) to troubleshoot the electrical problems at the plant, including the SCADA system. Furthermore, the Discharger has provided additional information regarding the following: approximately $795 for repair of the SCADA systems, $230,000 for the installation of an automatic gate to divert the plant effluent to the emergency storage ponds, $130,000 for a standby generator and approximately $314 for chlorination/dechlorination chemicals that were not used when the effluent was not being properly chlorinated or dechlorinated during the August and September events. Therefore, the minimum liability for the two occurrences is at least $79,968.

27. The following table contains the factors that were considered pursuant to CWC section 13385(e) in setting the initial penalty amount:

Factor	**Consideration**
Nature, Circumstances, Extent, and Gravity of the Violations	The Discharger has violated WDR Order No. R5-004-0073 by discharging partially-treated wastewater to the Sacramento River. A total of 637,963 gallons of discharged wastewater violated the total residual chlorine effluent limitation, and 2.486 million gallons of discharged wastewater was not properly disinfected.
Degree of Culpability	The Discharger has had several enforcement actions against them for similar occurences. In the last 8 years, there has been $42,000 in mandatory penalities assessed for fourteen violations.
Voluntary Cleanup Efforts	There was no cleanup of the discharged wastewater. When the Discharger noticed the effluent violations, they diverted the wastewater discharge into the onsite emergency storage ponds.
Susceptibility to Cleanup or Abatement	The total amount of partially-treated wastewater is not susceptible to cleanup. By the time the violations were corrected, the partially-treated wastewater was most likely diluted in the receiving water.

Factor	Consideration
Degree of Toxicity of the Discharge	The discharge on 21 August 2007 had a total chlorine residual of up to 3.0 mg/L, which could have been toxic to the organisms in the immediate vicinity of the discharge. The Discharger did not notice any fish kills downstream of the discharge.
Prior History of Violations	See Findings Nos. 4-8. The Discharger's history of violations did not mitigate the penalty amount, because the Discharger was on notice of the problems prior to the violations that are the subject of this Order.
Economic Benefit or Savings Resulting from the Violation	See Finding No. 26 for a discussion of this factor.
Ability to Pay	The Discharger has not submitted evidence of inability to pay the penalty or ability to continue in business.
Other Matters that Justice May Require	Staff costs for responding to violation are approximately $10,000.

28. Additional information was obtained from the Discharger and the State Water Resources Control Board (Division of Financial Assurances), that the monthly sewage rate for the City of Chico is approximately $15.67/mth (based on April 2007 data). A review of other similar wastewater facilities in Butte County, indicate that the average monthly sewage fee is approximately $17.72/mth (or $2.05/mth more than CWPCP). Based on the private service laterals in Chico (25,121 lateral connections – from CIWQS), the Discharger annual sewage fees are approximately $617,977 lower than the average yearly sewage fees for Butte County for similar wastewater treatment facilities.

29. CWC section 13385 states, in part:

"(l)(1) In lieu of assessing penalties pursuant to subdivision (h) or (i), the state board or the regional board, with the concurrence of the discharger, may direct a portion of the penalty amount to be expended on a supplemental environmental project in accordance with the enforcement policy of the state board. If the penalty amount exceeds fifteen thousand dollars ($15,000), the portion of the penalty amount that may be directed to be expended on a supplemental environmental project may not exceed fifteen thousand dollars ($15,000) plus 50 percent of the penalty amount that exceeds fifteen thousand dollars ($15,000)."

"(2) For the purposes of this section, a "supplemental environmental project" means an environmentally beneficial project that a person agrees to undertake, with the approval of the regional board, that would not be undertaken in the absence of an enforcement action under this section."

30. On 18 July 2008, the Discharger submitted a letter proposing to fund the Big Chico Creek Water Quality and Citizen Monitoring Program as a supplemental environmental project (SEP) to offset a portion of the administrative civil liability. The proposed water quality monitoring program has a total budget of $68,019 and will be administered by Big Chico Creek Watershed Alliance. The proposed project would support a significant monitoring effort through December 2009, and will include monitoring objectives to closely track the effects of land use practices on water quality, within the Big Chico Watershed Area. Details of the SEP proposal are provided in Attachment A, a part of this Order.

31. Issuance of this Administrative Civil Order is exempt from the provisions of the California Environmental Quality Act (Pub. Resources Code § 21000, et seq.), in accordance with California Code of Regulations, title 14, section 15321 (a)(2).

32. On 15 March 2007, the Central Valley Water Board explicitly delegated to the Executive Officer the authority to issue Orders to assess administrative civil liability where the matter is not contested by the discharger. (Resolution R5-2007-0009).

33. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date this Order becomes final, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

IT IS HEREBY ORDERED that the Discharger shall pay a penalty of $100,000 as follows, which includes funding the Big Chico Creek Watershed SEP project:

1. **Within 30 days of this Order becoming final**, the Discharger shall pay $31,981 by check, which contains a reference to “ACL Order No. R5-2008-0593” and is made payable to the *State Water Pollution Cleanup and Abatement Account*.

2. By 1 January, annually, the Discharger shall provide a status report to the Central Valley Water Board documenting progress of the supplemental environmental project.

3. By 1 April 2010, the Discharger shall provide a final report documenting completion of the supplemental environmental project as described in Finding 28 and Attachment A of this Order, and proof of expenditures totaling at least $68,019 on the SEP. If the Discharger does not maintain compliance with this schedule and if the Discharger does not receive explicit written extension of this timetable by the Executive Officer, the Discharger, upon demand of the Executive Officer, shall pay the remaining $68,019 by

check, which shall contain a reference to "ACL Order No. R5-2008-0593" and shall be made payable to the State Water Pollution Cleanup and Abatement Account.

4. This Order constitutes a settlement of the violations alleged in Administrative Civil Liability Complaint No. R5-2008-0509. Notice of this settlement will be published on the Central Valley Water Board's website, and will be provided to all interested parties. This Order is becomes final upon expiration of the 30-day public notice and comment period mandated by Federal regulations (40 CFR 123.27) and upon signature.

Signed by
PAMELA C. CREEDON, Executive Officer

1 December 2008
Date

GC: sae

ATTACHMENT A

PROPOSED SUPPLEMENTAL ENVIRONMENTAL PROJECT TO ADDRESS ADMINISTRATIVE CIVIL LIABILITY COMPLAINT NO R5-2008-0509

BIG CHICO CREEK WATERSHED ALLIANCE
BIG CHICO CREEK WATER QUALITY AND CITIZEN MONITORING PROGRAM

A. PROPOSED PROJECT DESCRIPTION

The Big Chico Creek watershed is located in a region that includes the interface between the Sierra Nevada Range to the south, and the remnant volcanic flows of the Cascade Range to the north. Headwaters originate from cold-water springs on Colby Mountain and flow 45 miles to its confluence with the Sacramento River. Watershed elevation ranges from about 120 feet at the mouth to 6000 feet on Colby Mountain. The watershed also encompasses three smaller sub-drainages to the north: Sycamore, Mud, and Rock (ECR, 1998). The underlying geology includes areas where the creek cuts through Tuscan layers important in the recharge of the Lower Tuscan aquifer, which is being explored for a regional conjunctive use project.

The Big Chico Creek watershed has been modified for flood control, suffers impacts from urban population increases, and has lost important riparian habitat in its agricultural areas, yet still supports spring run salmon spawning and rearing and fall run rearing near the Sacramento River, as well as western pond turtle, foothill yellow-legged frog and other sensitive species.

The watershed also includes urban, suburban, rural residential, orchard, rangeland, and forestry land uses. These diverse and localized impacts of land use are sometimes difficult to detect and information collected over a long temporal scale is important to determine variations due strictly to land use practices. Citizen monitoring groups are perfect for collecting information needed to determine long-term trends in stream habitat quality as a function of diverse land use.

The proposed project intends to assess and monitor water quality in the Big Chico Creek Watershed through a multi pronged approach which engages community members in monitoring efforts, compiles and analyzes data collected, and provides education and outreach to promote understanding and action related to watershed health. A long term goal of the Alliance will be to interpret the outcomes and generate changed public action.

This project will implement and extend a successful monitoring program. This proposal outlines the Big Chico Creek Watershed Alliance's intent to support this ongoing effort including continued post monitoring of two restoration projects (Verbena Fields, and Bidwell II) in order to review and assess the impacts of the restoration efforts and land use on water quality. A description and portrayal of the Big Chico Creek Watershed Citizen Monitoring Program (Attachment A) has been provided to outline the goals, activities, strategies and dynamic outcomes generated through this program to date.

This project will be managed and guided with the leadership of expert staff. A Technical Advisory Committee (TAC) with state level and relevant local expertise and content knowledge, will provide recommendations for reviewing and updating the existing Monitoring Plan (MP).

Monitoring efforts are at the core of this project. Volunteers and Stream Teams will be recruited and coordinated to participate in the monitoring activities. Training will be provided for identified Teams using the updated comprehensive Volunteer Monitoring Manual and include standard methods and sampling protocols, and correct use of equipment. This in turn ensures data quality objectives are met and that data integrity is consistent with the previous four years of data from the BCCWA Citizen Monitoring Program.

Utilizing the schedule and parameters outlined in the MP, watershed monitoring activities will be conducted at 10 established monitoring stations. Multiple surveys collect data to track chemical physical and biological parameters to assess water condition. Additionally, continuous water temperature and storm event monitoring are conducted at 5 sites. Field and Laboratory testing will be consistent with a State Water Board approved Quality Assurance Project Plan (QAPP).

Stream Teams meet regularly to conduct ongoing water monitoring efforts during May through October, collecting relevant project data. Additional monitoring events are scheduled according to the MP and include bioassessment, storm event and post restoration site surveys. The Alliance has most of the existing water testing equipment available for use; however some updated monitoring equipment kits and supplies (e.g. batteries and calibration fluids) will be required.

Project outreach will encourage teachers and students from at least three local schools to participate in monitoring activities. Additionally, engaged youth receive watershed information, collect useful data to enhance identified monitoring data collected, and experience in water monitoring and testing activities. These activities occur on a varying schedule and encourage awareness and knowledge of water quality issues.

The project will support diverse outreach activities which will be featured in the local media. These will include specific and multi faceted strategies to include community engagement, education and training, and information dissemination including project assessment and effectiveness. Community outreach to recruit and engage monitoring activity volunteers is a critical project component. This ongoing effort requires significant contact and communication with community partners, related agencies, school site administration and teachers, and local and state regulatory entities. To promote this communication, a team of community representatives of watershed education, will be facilitated. This team will identify existing community watershed related activities, identify efficient and effective strategies to link those efforts with each other, reduce duplication, and further link specifically with the water monitoring activities identified in this project. Inter-organization outreach materials, information, education content will be aligned to promote a consistent community message and involvement opportunities.

Electronic information distribution will be supported through the Big Chico Creek Watershed Alliance website. Project data reports, maps, monitoring schedules and educational information will be posted quarterly. This information will engage and educate the general public and specific monitoring activity participants.

B. PROPOSED PROJECT BUDGET

BIG CHICO CREEK WATER QUALITY AND CITIZENS MONITORING PROGRAM BUDGET

REVENUE		**$**	**68,019**
EXPENSES			
I.	Personnel Costs		
a.	Project Facilitator	$	7,490
	Subtotal	***$***	***7,490***
b.	Benefits	$	4,313
	Total Personnel Costs	***$***	***11,803***
II.	Operating Expenses		
a.	Supplies, Telephone, Copying, Postage	$	350
b.	Travel and Conference	$	100
c.	Operating Expenses, accounting, insurance, etc	$	2,500
d.	Facility rental	$	500
e.	Sub Contractors & Project Operations incl.	$	33,600
	Sub Contractor Operating Expenses	$	6,550
	Monitoring Equipment & Lab Cost	$	10,000
	Total Operating Expenses	***$***	***53,600***
	Subtotal Personnel/Operate Exp.	***$***	***65,403***
	BCCWA overhead expense at 4%	***$***	***2,616***
	TOTAL BUDGET	***$***	***68,019***

PROPOSED PROJECT TASKS AND ACTIVITIES

TASKS AND ACTIVITIES WITH TIME DESIGNATION	HOURS
Task 1. Project Management	
1.1 Prepare Project Progress Reports and Final Reports	140
subtotal	**140**
Task 2. Revise Monitoring Plan and QAPP	
2.1 Update Monitoring Plan and QAPP	40
2.1 TAC Meeting Facilitation and Recommendation Integration	20
2.3 Landowner Access Agreements	10
subtotal	**70**
Task 3 Community Outreach and Partnership Development	
3.1 Develop outreach materials and commitment forms	70
3.2 Website update and maps	80
3.3 Present Project Highlights: Endangered Species Faire, Volunteer Picnic, Public Meeting	40
3.4 Develop and facilitate collaborative partnership	60
subtotal	**250**
Task 4. Training	
4.1 Develop training schedules	20
4.2 Update Monitoring Manual	40
4.3 Recruit participants and conduct trainings	160
subtotal	**220**
Task 5. Conduct Watershed Monitoring	
5.1 Update and maintain equipment and supplies	20
5.2 Conduct Monitoring	250
5.3 Update database	20
5.4 Analyze and interpret data	40
5.5 Prepare Annual Data Report	40
subtotal	**370**
Sub Contractor Task and Activities Total Hours	**1,050**
CSU Chico Interns (In Kind Contribution)	300

Big Chico Creek Watershed
Citizen Monitoring Program

Mountain Zone Foothill Zone

Valley Zone

Mission Statement:

The mission of the Big Chico Creek Watershed Alliance is to protect and enhance the ecological integrity and economic vitality of the Big Chico Creek watershed through cooperative efforts. In partnership with landowners, interested citizens, government agencies and private enterprise, we work to foster public education and understanding of sustainable land management, and ecosystem and water quality restoration and conservation.

Organizational Description:

The Alliance was formed in 1990 as a response to the decline of spring-run salmon within Big Chico Creek watershed. This initial endeavor resulted in a large land acquisition and the establishment of the Big Chico Creek Ecological Reserve. The Alliance has continued to focus efforts on building partnerships within the community, and with other organizations such as the Stewardship Council and the Sierra Nevada Alliance who are also interested in promoting resource protection, and public education.

The Alliance provides education and outreach events, workshops, coordinates watershed assessment, restoration, and invasive plant removal projects, and provides a stakeholder forum for the public to become knowledgeable of issues confronting the local ecosystem.

The Alliance also coordinates an on-going citizen monitoring program to facilitate community involvement in watershed assessments. Recently, the Stream Team effort has been expanded to link monitoring efforts with the educational needs of local youth through the formation of a Youth Stream Team at local schools.

The Stream Team effort was initially supported by the Sierra Nevada Alliance in 2004, CALFED in 2005, and again by Sierra Nevada Alliance and the Consolidated Grants Program in 2007. The current program is entering its fifth monitoring season and is funded through September 2008.

Existing Partnerships:

The activities supported by this project will utilize the following established partnerships:

Chico Unified School District	Community Collaborative for Youth
Butte Environmental Council	Friends of Bidwell Park
Chico Nature Center	Kids and Creeks
City of Chico Parks Department	CSU Chico CAVE Internship Program
Meechoopda Tribe	Big Chico Creek Ecological Reserve
SWRCB Clean Water Team	City of Chico Clean Creeks in the Classroom

Why Monitor Creeks

Clean water is a vital resource that most of the public has shown a great willingness to protect. Healthy creek systems like Big Chico Creek are integral to the overall function of the Sacramento River ecosystem important for safe drinking water, ground water recharge, flood control, provide critical habitat for listed and endangered fish and wildlife, and provide intrinsic scenic value to our community.

It is important to understand the current status of small but important water bodies such as Big Chico Creek. A variety of cumulative impacts can stress aquatic systems and impair their beneficial functions. Non-point source pollutants can flow from the land into creeks including sediment, synthetic materials from our roads and automobiles, fertilizers, nutrients, sewage leaks, and animal wastes. Creek monitoring provides useful baseline information that can be used to track these potential impacts.

Why Rely On Citizen Volunteers?

Citizen volunteers often have specific knowledge and expertise about our local environment and can help attain critical access to areas within the watershed that would otherwise be inaccessible. Their involvement has an important impact in reducing urban pollution from entering our waterways through an improved understanding of the ecological function of creek systems in general and increased use of pollution prevention measures leading to improved participation in watershed stewardship and resource protection efforts. They are also very dedicated and have a proven capacity to accurately and precisely perform monitoring tasks and ensure data quality objectives are achieved. Through their passionate dedication an amazing amount of information is collected that would not otherwise be possible.

Overview of Current Monitoring Program (2004-2008)

The Big Chico Creek Watershed Citizen Monitoring Program (Stream Team) has an existing State Water Resources Control Board (SWRCB) approved Quality Assurance Project Plan (QAPP) and Monitoring Plan (MP), and is funded through September 2008. The proposed project will provide support to continue monitoring efforts through 2009.

Primary Goals:

Public Education
Data Collection
Watershed Protection

Primary Objectives:

- Continue a watershed scale, volunteer monitoring program, to document long-term trends in watershed condition cumulatively resulting from restoration activities, land management changes, and natural processes.
- Involve student and community volunteers in monitoring efforts to encourage an understanding of watershed ecology and urban pollution prevention measures.
- Link efforts to educational needs of local youth.
- Link efforts to urban pollution prevention efforts.
- When possible, build on prior monitoring efforts to facilitate data sharing and to improve data analysis.

Desired Outcomes:

- Improved public understanding of watershed function and our connection to our environment
- Increased public knowledge of urban pollution prevention measures
- Improved student learning

- Increased public interest in participating in resource management decisions
- Improved watershed health

Approach:

Big Chico Creek Stream Team meets the 2nd Saturday of each month

2004 (4 sites) May, June, September, October
2005 - 2007 (10 Sites) May-October plus storm events

Monitoring efforts focus on collecting information during the summer months, and specifically in reaches where spring-run Chinook have been historically present. Temperature and water quantity are two factors influencing spring-run abundance in Big Chico Creek. Spring-run salmon enter Big Chico Creek during spring run off and depend on cool water pools for refuge from warmer water during the summer months while they wait to spawn later in the fall.

Purpose:

The purpose of the Big Chico Creek Watershed Citizen Monitoring Program is to provide baseline data.

Participation:

StreamTeam volunteers consist of two basic groups:

<u>School-based</u>
PV High, Chico High, Oroville High, North County, Chico Country Day, Four Winds, Hooker Oak, Community Collaborative for Youth Kids and Creeks, Clean Creeks in the Classroom

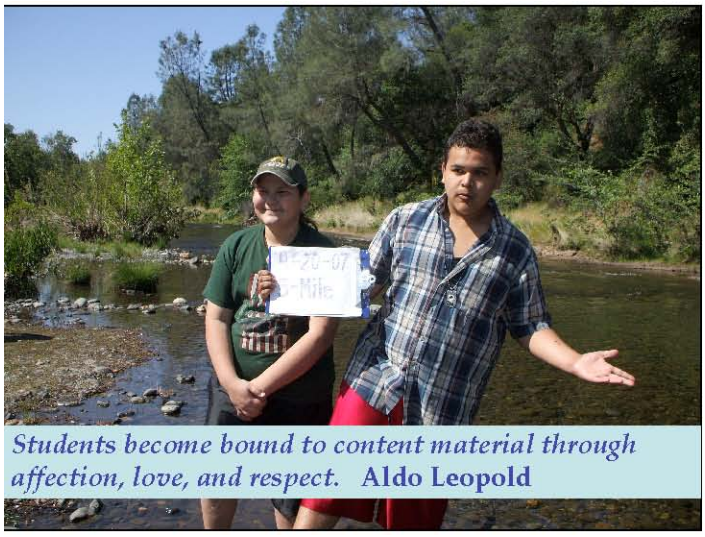
CSU Chico professors, students, and interns

<u>Community-based</u>

Landowners, retired professionals, community organizations, and the general public

Participation Levels (2004-2007)

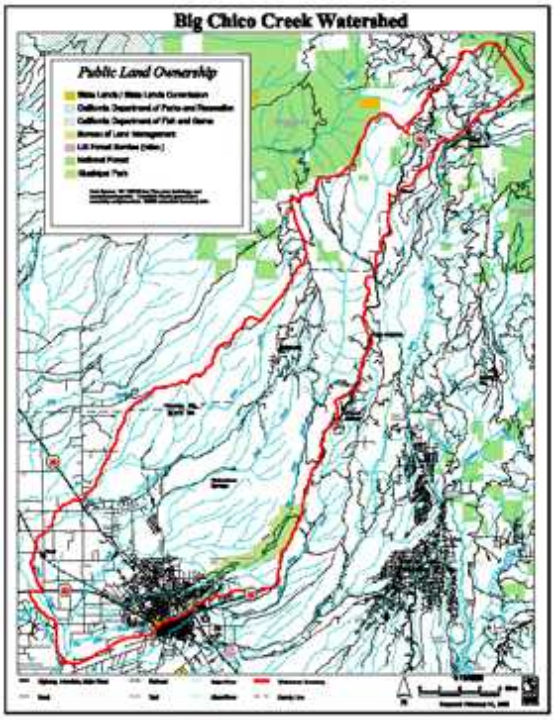
<u>Volunteer</u>	<u># Hours</u>
Stream Team	3,952
CUSD Students	5,943
CUSD Teachers	780
CSU Students	423
CSU Interns	417
Others	340



Student-Based Youth Stream Team Community Based Stream Team

Monitoring Station Locations: Three Land Use Zones (Mountain, Foothill, Valley)

Station #	Description
1	Hwy 32 Bridge
2	Higgin's Hole
3	Ecological Reserve
4	Above Brown's Hole
5	Below Bear Hole
6	Five-Mile
7	One-Mile
8	Warner Street Bridge
9	Rose Ave
10	@ Mouth



Continuous Temperature Monitoring Station Locations:

Station #	Description
T-1	Hwy 32 Bridge
T-2	Higgin's Hole
T-3	Henning Hole
T-4	Pool-T
T-5	Salmon Hole
T-6	Warner
T-7	Rose

High stream temperatures during summer months have been identified as a contributing factor in the decline of spring-run Chinook salmon populations within the Big Chico Creek watershed. Seasonal and diurnal patterns of stream water temperature are important for determining useful watershed management strategies and prioritizing restoration projects to protect aquatic habitat. The Big Chico Creek Volunteer Watershed Monitoring Program collects stream temperature to identify stream reaches with water temperatures within published ranges determined to be optimal, lethal or have chronic sub-lethal effects on growth and reproductive success of spring-run salmon. The Big Chico Creek watershed can be divided into three geologic zones: mountain, foothill, and valley. Each zone has distinct thermal gradients.

Sampling parameters:

Chemical

Temperature (air/water, and hobo temps)
pH
Dissolved Oxygen
Conductivity
Total Dissolved Solids
Total Suspended Solids
Total Solids
Turbidity
Nutrients (Ammonia, Ortho-P, Nitrate-N)

Physical

Flow
Photo Documentation
Streamwalk Surveys
Habitat Surveys

Biological

Benthic Macroinvertebrates
Bacteria/Pathogens

Sampling Schedule

Parameter	Frequency of monitoring
Temperature	Monthly (May- Oct.)
Dissolved Oxygen	Monthly (May- Oct.)
pH	Monthly (May- Oct.)
Conductivity (fresh water)	Monthly (May- Oct.)
Total Solids	September, October and 2 storm events
Turbidity	Monthly (May- Oct.)
Nutrients	September, October and 2 storm events
Coliform Bacteria	September, October and 2 storm events
Benthic Macroinvertebrates	Fall
Photo Documentation	Monthly (May- Oct.)
Flow	Monthly (May- Oct.)

The sampling schedule varies by location and monitoring parameter, as summarized in the above table. Sampling events are conducted regularly on the second Saturday of each month.

For coliform bacteria, and total solids, the sampling is limited to five stations during the months of September and October and during 2 storm events usually during November and February.

Biological surveys (bioassessment) and physical habitat assessments were limited to four stations during fall 2005 and expanded to seven stations through fall 2007. The proposed project would allow surveys to be conducted during fall 2008 and fall 2009.

Sampling Methods

Sampling is conducted as described in the Project's Quality Assurance Project Plan (QAPP). The QAPP describes field protocols, sample handling and analysis, and other activities designed to ensure data quality objectives are achieved and high quality data obtained during each monitoring event.

Temperature

Clean, cool, well oxygenated waters at optimal flow rates are important to all freshwater aquatic organisms –increased water temperatures, decrease the amount of dissolved oxygen, and concentrate toxic materials.

Seasonal and diurnal patterns of stream water temperature are also important for determining useful watershed management strategies and prioritizing restoration projects to protect aquatic habitat.

The Big Chico Creek Watershed Citizen Monitoring Program collected continuous stream temperature data during 2005 - 2007 to identify stream reaches with water temperatures within published ranges determined to be optimal, lethal or have chronic sub-lethal effects on growth and reproductive success of spring-run salmon.

Stream reaches in the mountain zone have optimal temperature ranges for upstream salmon migration, adult holding, spawning and juvenile rearing, but is outside their migratory range.

During adult holding periods, stream reaches in the foothill and valley zones appear to have less than optimal stream temperatures during the month of July.

Salmon that fail to move up into the foothills through the Iron Canyon Fish Ladder when flows are adequate for fish passage may become stranded in the valley zone and subject to sub-lethal and lethal high stream temperatures.

Micro-topographical effects in thermal patterns of the different reaches were clearly evident and suggest more detailed watershed studies.

Restoration efforts should focus on protecting the upper reaches of the watershed where the greatest temperature changes occur (Hwy 32 to Higgin's) and have the greatest influence on downstream water temperatures.

The graph provided shows 7-Day Running Daily Maximum Averages for Higgin's Hole, which represents a reach of the creek in the lower mountain zone and includes a large deep pool where spring-run salmon historically have been found holding over summer. Geological barriers prevent further upstream migration.