Ken Berry
In Pro Per
10567 Mariposa Avenue
Jackson, CA 95642
Telephone (209) 223-1769

BEFORE THE STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

Ken Berry, and **California Citizens for Environmental Justice** **Petitioners**	**PETITION NO. _____** **PETITION FOR REVIEW OF REFUSAL TO ENFORCE CALIFORNIA WATER CODE AND UNITED STATES CLEAN WATER ACT** **(Water Code §13320)**
North Coast Regional Water Quality Control Board **Acting Agency**	

INTRODUCTION AND SUMMARY

1. The Points & Authorities (P&A) for this Petition for Review contains a copy of letter written by petitioner to the Central Valley Regional Water Quality Control Board (R5WB) dated February 14, 2011. That letter requested that R5WB take action to enforce a condition of a permit that it had issued to the City of Jackson, which is located in Amador County.

2. The issue in this case is whether R5WB failed to take the action required of it pursuant to

the California Water Code (WC) and United States Clean Water Act (CWA) when it failed to enforce a condition of the National Pollution Discharge Elimination System (NPDES) permit No, CA0079391, which governs the discharge of effluent from the Jackson Wastewater Treatment Plant into Jackson Creek in Jackson, California. Jackson Creek is a tributary of the Mokelumne River located in Amador County.

PETITION INFORMATION

3. The following information is provided in accordance with the instructions on the State Water Resources Control Board (SWB) website at the following Internet address on May 12, 2011:

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http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

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3.1. Name, address, telephone number, and email address of Petitioners:

Ken Berry
California Citizens for Environmental Justice
10567 Mariposa Avenue
Jackson, CA 95642
209-223-1769
berry-k@sbcglobal.net

3.2. Action or inaction:

The P&A contains a copy of a letter requesting that theR1WB take action to enforce a condition of the NPDES permit No. CA0079391, issued to the City of Jackson to regulate the discharge of effluent from the Jackson Waste Water Treatment Plant to Jackson Creek in Amador County, California.

3.3. Date of action:

No action was taken for over 60 days since the request was mailed on February 14, 2011.

3.4. Statement of reasons why inaction is inappropriate or improper:

NPDES permit No. CA0079391 allows the City of Jackson to operate its waste water treatment plant in such as way as to violate water quality standards and pose a threat to the health and safety of human beings using Lake Amador as a source of drinking water. The permit contains a condition that requires Jackson to determine how the beneficial uses of Jackson Creek would be affected if the discharge of effluent ceased and present the results of the study in a Beneficial Use Attainment Study (BUAS). That condition further requires that the analysis be made on the basis of the flow of water in Jackson Creek. Jackson prepared a report, but the report is based on seasonal rainfall data, not creek flows. That difference is important because all 25 conclusions of the BUAS are reversed when creek flow data is used. R5WB acted inappropriately by accepting the BUAS even though it did not satisfy the condition of the NPDES permit because the flawed report misrepresents the beneficial uses of creek. R5WB has a duty to independently evaluate reports that it requires to be submitted.

3.5. How the petitioner is aggrieved:

Petitioners have a right to enjoy the benefits of Jackson Creek, Lake Amador, and the Mokelumne - Sacramento Delta without fear of being poisoned by unlawful discharges of disease causing substances. Petitioners have a right to accurate information concerning pollutants. Petitioners also have the right to enjoy the biological resources, and the existence of such resources, supported by Jackson Creek. By accepting the improperly prepared BUAS, R5WB accepted false conclusions that, if acted upon, will directly cause significant adverse impacts to the biological resources of Jackson Creek and unnecessary concern over water quality.

3.6. Action requested:

Petitioners request that SWB order the R1WB to require the City of Jackson to prepare a report conforming to the requirements of the NPDES permit.

3.7. Points and Authorities supporting Petitioners' request:

Water Code (WC) §13320 provides a procedure by which a citizen may appeal to the State Board the failure of a Regional Board to act under certain statutes. WC §13320 includes Chapter 5.5 of Division 7, commencing with WC §13370, in those statutes. Chapter 5.5 implements the United States Clean Water Act (CWA) into California code. The attached P&A provides detailed information concerning the conditions of the NPDES permit that are being violated due to the inaction of the R5WB.

3.8. Statement that notice has been provided to Regional Water Board and discharger:

Complete copies of this Petition have been mailed to the following persons and/or organizations:

//

Central Valley Regional Water Quality Control Board (Agency)
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

//

City of Jackson (Responsible Party)
33 Broadway
Jackson, CA 95642

//

3.9. Statement that issues were first raised with the Regional Water Board:

The P&A included with this Petition for Review contains a copy of the letter that was deposited in the United States Mail on February 14, 2011 requesting that R5WB take action to require the City of Jackson to comply with the NPDES permit by preparing the required report.

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Dated: May 17, 2011

/s/ Ken Berry,

California Citizens for Environmental Justice

VERIFICATION

4. I, Ken Berry, wrote the letter dated February 14, 2011, which is included in the Points and Authorities for this Petition for Review, that requests action by R5WB. I deposited the letter in the United States Mail, first class postage prepaid, on February 14, 2011. All of the statements in this Petition and the associated Points and Authorities represent my best effort to accurately report information presented to the City of Jackson in publicly available reports. All of the documents provided with the P&A are accurate copies of documents submitted to R5WB.

5. I so declare under penalty of perjury in Jackson, California.

Dated: May 17, 2011

/s/ Ken Berry,

California Citizens for Environmental Justice

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10567 Mariposa Avenue
Jackson, CA 95642
Telephone (209) 223-1769

BEFORE THE STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

Ken Berry, and California Citizens for Environmental Justice **Petitioners**	**PETITION NO. _____** **POINTS AND AUTHORITIES FOR PETITION FOR REVIEW OF REFUSAL TO ENFORCE CALIFORNIA WATER CODE AND UNITED STATES CLEAN WATER ACT**
North Coast Regional Water Quality Control Board **Acting Agency**	

INTRODUCTION AND SUMMARY

1. The City of Jackson (City), located in Amador County, owns and operates a waste water treatment facility (WWTF) that discharges effluent into Jackson Creek (Creek), which is a tributary of the Mokelumne River and hence the Sacramento River. Jackson Creek discharges to the Mokelumne River within the Sacramento Delta, west of Galt in Sacramento County. Jackson Creek is intermittent, becoming completely dry in late summer between Amador County and Galt.

2. Lake Amador (Lake) is a water storage facility created by Jackson Creek Dam, which is located approximately 8 miles downstream of the WWTF. Jackson Creek Dam is located near the small community of Buena Vista in Amador County. The Lake is primarily operated for irrigation of agricultural lands but also serves as the source of raw water for human consumption. As a source of water for human consumption, the Lake is being replaced by water derived from Pardee Reservoir on the Mokelumne River, but replacement will not be complete for several years.

3. The Department of Public Health (DPH) believes that the discharge of effluent may make the Lake unsafe as a source of water for human consumption, but no water quality standards are being violated. In order to provide a margin of safety for unregulated contaminants known to be present in treated municipal waste water, DPH requires that the amount of effluent from the Jackson WWTF present in Lake Amador never exceed 5% of the total volume at any time. This requirement is herein known as "the DPH condition" to distinguish this requirement from other water quality requirements.

4. There is no evidence that any water quality standard is violated by the water stored in Lake Amador. However, this Petition does not challenge the DPH condition. This petition accepts that the DPH condition requires action by R5WB just as if a standard established by R5WB or the State Water Resources Control Board (SWB) were violated. It is important to understand that it is only the DPH condition that is violated because it is necessary to understand the hydrology of Jackson Creek to know whether the DPH condition is violated. Other water quality standards are based on direct testing of contaminant levels, but the DPH condition specifically addresses contaminants for which there is no test and which are treated generically as being present in treated municipal wastewater effluent.

5. The DPH condition presents a potential physical difficulty because the volume of water in Lake Amador fluctuates during the year. Jackson Creek is typical of streams draining the west slope of the Sierra Nevada mountains in Central California because most of the water it carries flows in the winter and spring. Most similar streams are intermittent and become dry in late summer. Most

water in the Lake is used for irrigating agricultural lands during the summer and fall, and therefore the amount of water steadily decreases from a high level in Spring to a minimum level in late Fall. However, the effluent discharged from the Jackson WWTF is approximately constant throughout the year. Therefore the concentration of effluent in the Lake increases from a minimum in the Spring to a maximum in late Fall.

6. Very rough calculations indicate that the amount of effluent in the Lake can exceed the DPH limit of 5% in drought years, particularly multiple drought years. Lake Amador is designed to provide enough storage that irrigation operations are not affected by two consecutive drought years. As a consequence, the Lake is only partially full at the beginning of summer in the second and subsequent drought years. Therefore, the steady flow of effluent produces the maximum concentration at the end of second and subsequent drought years.

7. Whether a given year is considered to be a drought year or not, there is considerable variation between years. Therefore it is not possible to simply compare the natural inflow to Lake Amador to the amount of effluent produced. Besides the varying amount of inflow, the use of water for irrigation during the dry season reduces the amount of water available for dilution of the effluent. Therefore it is necessary to consider the hydrology of Jackson Creek over several years to determine if the DPH condition is ever violated.

8. One way to satisfy the DPH condition at all times is to remove the effluent from the WWTF from the Creek. If the effluent is disposed to land, or a significant portion of the effluent is disposed to land, the proportion of effluent in the Lake can be ensured to be less than 5% at all times. While this is a certain means of avoiding the DPH condition, disposal to land is expensive and has adverse environmental consequences, including cumulative effects.

9. The Central Valley Regional Water Quality Control Board (R5WB) is responsible for protecting all of the beneficial uses of Jackson Creek and other surface and ground waters within the drainage basin of the Sacramento River, of which the Mokelumne River is a tributary. Jackson Creek is a tributary of the Mokelumne River and is therefore regulated by R5WB. Some of the beneficial

uses of Jackson Creek are the biological resources in the stream and along its banks.

10. Because R5WB must protect all beneficial uses, it required the City to prepare a Beneficial Use Attainment Study (BUAS) to determine if removing the effluent from the creek would adversely affect any beneficial uses.

11. The BUAS is fraudulent because it asserts that it is based on flow data, as was required by R5WB in the NPDES permit. However, the consultant preparing the BUAS actually selected one year, 2008, because during that year there was a rare regional drought, and only used flow data for that year. In particular, the flow data for 2007, which was not a drought year but also showed that Jackson Creek was drying up in late summer, was ignored. Therefore the BUAS was actually based on regional climate data, not flow data as required.

12. Because the BUAS based its conclusion on climatic data, it concluded that Jackson Creek would become dry only once in every 13-14 years. That conclusion contradicts the creek flow data available at the time the BUAS was prepared, which shows that Jackson Creek will become dry 2 years out of 8 years. Subsequent data indicates that without the effluent discharged from the WWTF, the Creek will become dry every year. 25 conclusions in the BUAS were based on the false conclusion that the Creek would become dry only once every 13-14 years.

13. The BUAS was deliberately prepared with false information because the City desires to pursue a land disposal option for the benefit of easy expansion to support future private development of residential housing. It is not relevant why the BUAS was prepared to make a false conclusion because it is the responsibility of R5WB to examine and evaluate reports prepared for its consideration.

14. R5WB failed to detect the fraudulent analysis in the BUAS on its own. The R5WB employee in charge of the project has long standing personal ties to the consultant who prepared the BUAS. That relationship is purported to be professional, but it does not matter whether the R5WB employee deliberately ignored the fraudulent analysis in the BUAS or merely did not read carefully enough. R5WB failed to perform a competent independent evaluation of the BUAS.

15. The analysis of the BUAS that I prepared and which is attached to this P&A itself includes copies of the relevant pages of the BUAS and conclusively demonstrates that the BUAS is based on regional rainfall data, and not flow data from Jackson Creek. Furthermore, the BUAS is clear that by using creek flow data, 25 conclusions will be reversed. Those 25 conclusions are that removing the effluent will have no significant adverse impact on the biological resources of Jackson Creek. The correct conclusion is that removing the effluent will have a significant adverse impact on the biological resources of Jackson Creek.

EXHIBITS

16. Attached to this Points and Authorities are several documents as shown below. The documents have been Bates stamped. The numbers shown below are the Bates range.

[000001] Page 23 of NPDES Permit No. CA0079391

[000002-000003] Pages 25 and 26 of NPDES Permit No. CA0079391

[000004] Letter dated 2/14/11 requesting enforcement of Permit No. CA0079391

[000005] Letter dated 2/14/11 requesting enforcement of Permit No. CA0079391

[000006-000007] Pages 25 and 26 of NPDES Permit No. CA0079391

[000008] Page 1-3 from BUAS proposed methodology

[000009-000034] Analysis of BUAS with exhibits from BUAS

[000035-000040] BUAS Preliminary Findings and Proposed Analysis Mehtods

There is some redundancy. Bates numbers are used for reference because some documents already have exhibit numbers. The letter contained in pages [000009-000034] was intended to be a formal comment for the California Environmental Quality Act (CEQA) process conducted by the City, but it incidentally documents the fact that the BUAS does not meet the requirement of the NPDES permit because the BUAS is not based on flow data.

17. Pages [000001-000003] show that the BUAS is required by the NPDES permit. Pages [000006-000007] highlight the requirement that a work plan be developed to analyze the beneficial uses of Jackson Creek downstream of the WWTF.

18. Page [000008] is Page 1-3 of the work plan. The complete work plan begins on page [000035]. Page [000008] highlights the requirement that the BUAS be based on flow data.

19. Page [000039] is Page 1-5 of the work plan. Graphs of the flow in Jackson Creek are shown for 8 years. This data was not complete, but shows that the Creek flow dropped below the 0.1 cubic feet per second (cfs) that differentiates perennial from intermittent streams. All parties to the BUAS knew that Jackson Creek had dried up in multiple years, including 2007, and not just 2008. R5WB failed in its duty to review the BUAS by overlooking this fact.

20. Pages [000017-000026] are the complete flow data for Jackson Creek for the years 2001 through and including 2010. Years 2009 and 2010 were not available at the time the BUAS report was prepared, but years 2007 and 2008 were. The complete data shows that Jackson Creek became intermittent only in 2007 and 2008.

21. Pages [000009-000010] are highlighted where the BUAS is shown to be fraudulent. That letter is not specifically about the failure to comply with the NPDES permit, but is concerned with the environmental consequences of relying on the fraudulent report. However, the letter does analyze the BUAS and its conclusions are relevant to how R5WB failed to perform its duties.

22. Page [000015] is the fraudulent statement in the BUAS. The highlighted passage asserts that flow data was used because that is the requirement of the NPDES permit, but in fact regional climate data was used to select a single year for which flow data was used. The flow data for 2007 was ignored because had that data been considered, the conclusion of the BUAS would be reversed.

23. The highlight at the top of Page [000016] discloses the importance of the conclusion reached in the BUAS. If the Creek remains wet enough to support the biological resources, that beneficial use is protected. But if the Creek becomes to dry to support the biological resources, that beneficial use is not protected. This is the information needed by R5WB to issue a new NPDES permit that lawfully protects all beneficial uses.

24. The highlight at the bottom of Page [000016] is the fraudulent conclusion. It is based on the single year of 2008.

25. Page [000023] shows the actual flow data for 2007. The Creek became dry for several days. Therefore the correct conclusion based on the data available at the time the BUAS was prepared is that the Creek becomes dry in 2 of 8 (or 1 in 4) years.

26. Pages [000025-000026] show the actual flow data for 2009 and 2010, which were not available at the time the BUAS was prepared. They confirm that Jackson Creek becomes intermittent every year.

27. The reason for the change in behavior of Jackson Creek after 2006 is because the Amador Water Agency partially closed the Amador Canal in 2007. Prior to 2007, the Amador Canal leaked water into the Jackson Creek watershed and therefore the creek never went dry above the discharge point for the WWTF. Subsequent to 2006, the leakage was curtailed and the Creek became intermittent. The Amador Canal is still in partial operation and leaking, so future conditions will be worse when closure is complete.

28. The City, its consultant, and R5WB were all aware of the influence of the Amador Canal on Jackson Creek. DPH specifically mentioned the closure of the Amador Canal in its letter setting the 5% dilution requirement. The effect of the canal can be seen from the flow data by comparing years 2003 [000019] and 2009 [000025]. Both years had comparable rainfall, but the amount of water in the Creek was high all through 2003 but dried up in 2009. The sole relevant difference between those years is reduced leakage from the Amador Canal in 2009.

29. The BUAS as presented does not satisfy the conditions of the NPDES permit because its conclusion is not based on the creek flow data, as required by the permit. R5WB is derelict for not correcting the conclusion of the BUAS. Such correction can be made because the language of the BUAS clearly predicates the conclusion that the biological resources would not be significantly adversely impacted because and only because the Creek would remain wet. Actual flow data shows that the Creek will become dry, and therefore the conclusion must be reversed- namely, there will be a significant adverse impact.

CONCLUSION

30. R5WB has approved the BUAS despite specific evidence that the conclusions are fraudulently based on regional climate data rather than creek flow data. The NPDES permit requires that creek flow data be used. The NPDES permit also requires that the BUAS be prepared within a certain time period. Because the report prepared does not meet the requirement of the permit (namely that the report be based on creek flow data), Jackson is in violation of its NPDES permit.

31. The R5WB needs to take action to enforce the requirements of the NPDES permit.

32. Therefore, Petitioner requests the SWB to order R5WB to require the City to submit a report that conforms to the requirements of the NPDES permit by being based on the actual flow data in the creek.

33. Alternatively, SWB may accept or order R5WB to accept the BUAS on the condition that it be amended to show that removal of the effluent produced by the Jackson WWTF from Jackson Creek will have a significant adverse impact on some beneficial uses of Jackson Creek.

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Dated: May 17, 2011

/s/ Ken Berry,

California Citizens for Environmental Justice

NPDES permit, then this Order may be reopened to reevaluate the mercury mass loading limitation(s) and the need for a mercury offset program for the Discharger.

d. **Pollution Prevention.** This Order requires the Discharger prepare pollution prevention plans following CWC section 13263.3(d)(3) for aluminum; ammonia; copper; cyanide; diazinon; dichlorobromomethane; 1,2-diphenylhydrazine; 2,6-dinitrotoluene; tetrachloroethene; and zinc. Based on a review of the pollution prevention plans, this Order may be reopened for addition and/or modification of effluent limitations and requirements for these constituents.

e. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.

f. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for constituents in this Order. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

g. **Jackson Creek Beneficial Use Attainment Study.** This Order requires the Discharger to conduct a Beneficial Use Attainment Study for Jackson Creek, downstream of the discharge location. Based on a review of the findings of this study, and information pertaining the protection of downstream water rights and the feasibility of State Water Board Division of Water Rights approval for a decrease in discharge to the receiving water, this Order may be reopened for additional and/or modification of effluent limitations, prohibitions, and other requirements.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, this Provision requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity. If the discharge exceeds the toxicity numeric monitoring trigger established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE Work Plan, and take actions to mitigate the impact of the discharge and

monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

b) If the source(s) of the toxicity is easily identified (i.e., temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and initiate a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of the test results exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Regional Water Board including, at minimum:

1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including TRE WET monitoring schedule;

2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and

3) A schedule for these actions.

Within sixty (60) days of notification by the laboratory of the test results, the Discharger shall submit to the Regional Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with USEPA guidance.

b. **Jackson Creek Beneficial Use Attainment Study.** The Discharger shall develop a work plan for a study to 1) further determine the characteristics needed in Jackson Creek downstream of the discharge to support applicable non-human health protection beneficial uses (agricultural supply for irrigation and stock watering, industrial process supply and service supply, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm and cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.), and 2) identify the minimum flow necessary to meet downstream existing water rights.

The work plan shall be developed in consultation with the Department of Fish and Game, Department of Public Health, State Water Board Division of Water Rights, and Regional Water Board staff. The work plan is due **within six months after the adoption date of the permit**; the study shall be

implemented and completed **within 18 months of approval of the workplan.**

3. Best Management Practices and Pollution Prevention

a. **Salinity Evaluation and Minimization Plan.** The Discharger shall prepare a salinity evaluation and minimization plan to address sources of salinity from the Facility. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer.

b. **Pollution Prevention Plan.** The Discharger shall prepare and implement a pollution prevention plan for aluminum; ammonia; copper; cyanide; diazinon; dichlorobromomethane; 1,2-diphenylhydrazine; 2,6-dinitrotoluene; tetrachloroethene; and zinc in accordance with CWC section 13263.3(d)(3), and as specified in section VI.7.a.ii of this Order.

c. **2,3,7,8-TCCD Congeners Source Evaluation and Minimization Plan.** The Discharger shall prepare and implement a 2,3,7,8-TCCD congeners evaluation and minimization plan to address sources of detectable dioxins (OCDD) and furans (OCDF) from the Facility. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer.

4. Construction, Operation and Maintenance Specifications

[NOT APPLICABLE]

5. Special Provisions for Municipal Facilities

a. **Sludge/Biosolids Discharge Specifications**

i. Collected screenings, residual sludge, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) that are operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy these specifications.

ii. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant performance.

iii. The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will exceed the groundwater protection standards contained in the Basin Plan. In addition,

Ken Berry 10567 Mariposa Avenue, Jackson CA 95642 209-223-1769 berry-k@sbcglobal.net

February 14, 2011

Kenneth D. Landau, Assistant Executive Officer
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

Re: City of Jackson NPDES Permit No. CA0079391
Order No. R5-2007-0133
California Public Records Act Request

Dear Mr. Landau,

Enclosed please find a letter requesting enforcement of the provisions of NPDES Permit No. CA0079391 (Permit) for the City of Jackson Wastewater Treatment Facility (WWTF).

I just read your letter dated February 14 which is apparently intended for consideration by the Jackson City Council at their regular meeting of the same date, and on which agenda the WWTF is scheduled for discussion. It is unfortunate that you did not allow more time for consideration of your remarks as the Council meeting has been scheduled for several weeks.

As you will see from the attached documents, your evaluation of the Beneficial Use Attainment Study (BUAS), and the evaluation of the same document by the California Department of Fish and Game (CDFG), are seriously mistaken. In brief, because the Central Valley Regional Water Quality Control Board (R5WB) and CDFG did not examine the actual data used, you accepted the conclusion of the BUAS that conditions harmful to the riparian habitat would occur only once in 13-14 years. The actual data that was supposed to be used in the BUAS according to the Work Plan approved by R5WB and CDFG indicates that the harmful conditions have occured every year since 2007 and will occur every year in the future. Please correct your evaluation to reflect the facts in the record, including the actual creek flow data required by the R5WB to be gathered for the analysis in the BUAS and other purposes.

Furthermore, because the City did not base the BUAS on the data specified in the work plan, the submitted document does not satisfy the conditions of the Permit (Provision VI.C.2.b).

Please consider this and the enclosed letter to be a formal requests pursuant to Water Code Section 13320 for the enforcement of all of the conditions of the Permit.

Please also consider this a request pursuant to the California Public Records Act (CPRA, Government Code Section 6250 and following) for access to all correspondence in the possession of R5WB concerning the BUAS and its preparation and interpretation.

Yours Truly,

Ken Berry, California Citizens For Environmental Justice

Ken Berry 10567 Mariposa Avenue, Jackson CA 95642 209-223-1769 berry-k@sbcglobal.net

February 14, 2011

Ken Landau, Assistant Executive Officer
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

Re: City of Jackson NPDES Permit No. CA0079391
Order No. R5-2007-0133

Dear Mr. Landau,

Attached please find a copy of an analysis that I prepared which is dated January 2, 2011. That analysis demonstrates that the Beneficial Use Attainment Study (BUAS) prepared in accordance with Provision VI.C.2.b (Jackson Creek Beneficial Use Attainment Study) on pages 25-26 of the Permit does not satisfy condition 1), which requires the City to "... further determine the characteristics needed in Jackson Creek downstream of the discharge to support applicable non-human health protection beneficial uses (... aquatic habitat ...)." Pages 25-26 are attached.

A Work Plan was required for the BUAS to be submitted within 6 months after the adoption of the Permit and the study was required to be submitted within 18 months of approval of the Work Plan. The Permit was adopted by Order on October 25, 2007. The Work Plan was approved on August 27, 2008. The BUAS is dated July 2009.

A report concerning the preliminary findings of the BUAS and a proposed method of analysis dated October 17, 2008 was prepared for the California Department of Fish and Game and the Central valley Regional Board, and is attached ahead of my analysis. Under Section 1.3 (Method of Analysis), method 4 (Conduct Flow Analysis) on page 1-3 contains the following statement: "Simulate potential effects of WWTP discharge removal on streamflow below the outfall by subtracting historical daily average WWTP discharge from historical daily average streamflow above the outfall."

As explained in the attached report that I authored, the BUAS is not based on streamflow data. The BUAS is based on regional rainfall conditions, with only the streamflow for 2008 used to falsely conclude that the flows in Jackson Creek are controlled by drought conditions. The streamflow data for 2007 was ignored, contrary to the requirements of the Permit, to arrive at that conclusion.

Does the failure of the City to comply with Permit Provision VI.C.2.b within the specified time period mean that the City is discharging without a permit for the purposes of the Clean Water Act? Please consider this a formal request to the Central Valley Regional Board to enforce Provision VI.C.2.b.

Yours Truly,

monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

b) If the source(s) of the toxicity is easily identified (i.e., temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and initiate a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of the test results exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Regional Water Board including, at minimum:

1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including TRE WET monitoring schedule;

2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and

3) A schedule for these actions.

Within sixty (60) days of notification by the laboratory of the test results, the Discharger shall submit to the Regional Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with USEPA guidance.

b. **Jackson Creek Beneficial Use Attainment Study.** The Discharger shall develop a work plan for a study to 1) further determine the characteristics needed in Jackson Creek downstream of the discharge to support applicable non-human health protection beneficial uses (agricultural supply for irrigation and stock watering, industrial process supply and service supply, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm and cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.), and 2) identify the minimum flow necessary to meet downstream existing water rights.

The work plan shall be developed in consultation with the Department of Fish and Game, Department of Public Health, State Water Board Division of Water Rights, and Regional Water Board staff. The work plan is due **within six months after the adoption date of the permit**; the study shall be

implemented and completed **within 18 months of approval of the workplan.**

3. Best Management Practices and Pollution Prevention

a. **Salinity Evaluation and Minimization Plan.** The Discharger shall prepare a salinity evaluation and minimization plan to address sources of salinity from the Facility. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer.

b. **Pollution Prevention Plan.** The Discharger shall prepare and implement a pollution prevention plan for aluminum; ammonia; copper; cyanide; diazinon; dichlorobromomethane; 1,2-diphenylhydrazine; 2,6-dinitrotoluene; tetrachloroethene; and zinc in accordance with CWC section 13263.3(d)(3), and as specified in section VI.7.a.ii of this Order.

c. **2,3,7,8-TCCD Congeners Source Evaluation and Minimization Plan.** The Discharger shall prepare and implement a 2,3,7,8-TCCD congeners evaluation and minimization plan to address sources of detectable dioxins (OCDD) and furans (OCDF) from the Facility. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer.

4. Construction, Operation and Maintenance Specifications

[NOT APPLICABLE]

5. Special Provisions for Municipal Facilities

a. **Sludge/Biosolids Discharge Specifications**

i. Collected screenings, residual sludge, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) that are operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy these specifications.

ii. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant performance.

iii. The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will exceed the groundwater protection standards contained in the Basin Plan. In addition,

4. **Conduct Flow Analysis:** Simulate potential effects of WWTP discharge removal on streamflow below the outfall by subtracting historical daily average WWTP discharge from historical daily average streamflow above the outfall. Describe predicted changes in timing, magnitude, frequency, and duration of flows, and how these changes would affect other key habitat variables, focusing on the effluent dominated months when discharge removal would result in little or no flow below the outfall (see Figures 1-1 to 1-3).

5. **Evaluate Potential Impacts:** Qualitatively evaluate potential effects of WWTP discharge removal on existing beneficial uses based on predicted changes in habitat conditions below the outfall and the expected responses of the key evaluation species and communities.

Table 1-1 below, outlines an example of the species and community parameter screening process. In addition, predicted daily flow changes and frequency distribution curve based on the upstream stream hydrology and the effluent data for the past eight years (2001-2008) are depicted in Figures 1-1a/b, and 1-2, respectively.

Note: Flow estimates upstream of the WWTF are from 2001-2008 and therefore do not reflect the potential future decrease in flow conditions when the Amador Water Agency canal is converted to a pipeline.

1.4 PRELIMINARY FLOW FINDINGS AND PROPOSED APPROACH

Based on our analysis of daily average flow rates (2001-2008) above the outfall (R1 Station), Jackson Creek has gone dry for periods greater than 30 days during three of the past eight years (Figure 1-1, Table 1-2). The key period when effluent dominates (consists of more than 50%) of the flow below the outfall is July to September in moderately dry to dry years (2001/2002, 2003, 2007 and 2008) (Figure 1-2). During these drier years, in the late summer/early autumn period the flow rate at R1 above the outfall was either zero or the flow rate was so low that removal of the effluent in combination with evapotranspiration and seepage may have caused it to go dry below the outfall. Therefore, the proposed analysis methods will focus on species requirements during late summer and early autumn.

In addition, to better understand the overall changes in the creek hydrograph under zero effluent conditions, the City proposes to utilize a frequency distribution curve to assess projected frequency of dry and low flow conditions. Based on flow data from 2001-2008, if the effluent were absent from the system, the stream would have been dry below the outfall 5% of the time (i.e. 164 days in 8 years, Figure 1-3, Table 1-2). This is the number of days R1 was dry during the period of record. R1, above the outfall went completely dry during 35, 62, 1, and 38 days during the years of 2001, 2002, 2003, and 2008, respectively.

Therefore, the proposed analysis methods will focus on species requirements during the expected stressor period with respect to flow, July to September, and will address the impacts of such changes is flow-rate frequencies (Tables 1-2) on key species and community indicators (Table 1-1) in a qualitative manner.

Ken Berry 10567 Mariposa Avenue, Jackson CA 95642 209-223-1769 berry-k@sbcglobal.net

January 2, 2011

City of Jackson
33 Broadway
Jackson, CA 95642

Re: Beneficial Use Attainment Study

This letter is intended to be considered when the City determines the scope of the environmental document required for modifications to the City's Wastewater Treatment Facility (WWTF). It is also intended to be a comment on any draft environmental document prepared pursuant to CEQA for the aforementioned project.

The City of Jackson intends the use the Beneficial use Attainment Study (BUAS) dated July 2009 that was prepared by Ecologic (now Stantec) as part of an environmental document prepared pursuant to the California Environmental Quality Act (CEQA). The BUAS contains a fundamental error that makes it unsuitable for use in evaluating the impact of removing recycled water (effluent) discharged by the City's Wastewater Treatment Facility (WWTF) on the biological resources of Jackson Creek.

Page 1-5[1] in section 1.4 (Future Steps And Phasing) indicates that compliance with CEQA will take place after the regulatory agencies determine whether the City can comply with Central Valley Regional Water Quality Control Board Order No. R5-2007-0133. This project is apparently in violation of CEQA because the project is defined by compliance with the Order. California public agencies, including both state and local agencies, must comply with CEQA prior to making a decision concerning a project that is subject to CEQA.

The following sections further discuss the deficiencies of the Ecologic/Stantec BUAS.

Hydrology

The BUAS report uses an incorrect hydrological model for Jackson Creek. Furthermore, the report is incompetent because the correct hydrological model was available to Ecologic/Stantec and is referred to in the BUAS as the source of flow data on page 2-5[2] in section 2.3.1 (Flow Data).

The significance of the model is disclosed on page 7-1[3] in section 7 (Conclusions) to support the conclusion that all beneficial uses will continue to be met. In the final paragraph on that page, the BUAS says "In addition, on rare occasion [sic] (on a statistical average of approximately 13-14 years) critically dry conditions would likely result in (similar to 2008) approximately 1-2.5 months of low or no flow. Such an infrequent disruption to critical life stages is not considered

[1]Exhibit A is page 1-5 of the BUAS.
[2]Exhibit B is page 2-5 of the BUAS.
[3]Exhibit C is page 7-1 of the BUAS.

significant because it would not likely result in the elimination of a species or population."

That statement is contradicted by the Flow Data. Attached are ten charts[4] showing the relationship of canal flow to Jackson Creek flow at the WWTF. Each chart shows a single calendar year. The creek flow data referred to on page 2-5 of the Ecologic/Stantec report is plotted as the blue lines.

Instead of conditions similar to 2008 occurring once in 13-14 years, as claimed by the BUAS, they are occurring and will continue to occur every year, with greater severity in the future, as disclosed by the actual flow data that was cited as the source data, but not used, by Ecologic/Stantec.

The charts were prepared by Bill Condrashoff, based on information from the City, Amador Water Agency (AWA), and a rain gauge on his property at an elevation of approximately 2,000 feet several miles east of Jackson above the South Fork of Jackson Creek.

In contradiction to the false statement that the 2008 conditions only occur once every 13-14 years, Jackson Creek became intermittent in 2007, 2008, 2009, and 2010, according to the gauge installed in Jackson Creek for monitoring flow.

Although Ecologic/Stantec says they are using stream flow data, that is not true. On page 3-2[5] in section 3.2.1 (Study Year - Precipitation Context), it is explained that 2008 was a drought year and therefore was selected as a worst case. That falsely assumes that climate determines whether Jackson Creek is intermittent or perennial at the WWTF. When the actual flow data, which was collected specifically to create an objective record, is examined, it is clear that Jackson Creek will be intermittent every year because water is no longer leaking from the Amador Canal.

The charts for years 2003[6] and 2009[7] show that Ecologic/Stantec never made the analysis claimed in the BUAS. The rainfall was 26.89" in 2003 and 27.84" in 2009. Yet the creek became intermittent in 2009 and not in 2003. The difference, of course, is that the Amador Canal was in full operation, and leaking, in 2003 and flowed far less volume in 2009. The canal has not been fully closed, so the stream conditions will be even worse in the future. The hydrological model used by Ecologic/Stantec, that Jackson Creek flows are determined by regional climate cannot explain the actual data because the model is invalid.

According to the most relevant records, Jackson Creek becomes intermittent at least 4 out of every 10 years. The BUAS claims "1 in 13-14" because that is the frequency of regional drought years such as 2008. Even in the extremely mild 2010 summer, Jackson Creek became intermittent at the WWTF.

Ecologic/Stantec knew that the City was expending funds to collect objective measurements of stream flow. Ecologic/Stantec knew that dewatering the Amador Canal would adversely impact the flows in Jackson Creek because that is an explicit concern of the California Department of

[4]Exhibits D01 through D10 are the charts for the years 2001 through 2010.
[5]Exhibit E is page 3-2 of the BUAS.
[6]Exhibit D03.
[7]Exhibit D09.

Public Health (CDPH). Therefor it was malfeasance for Ecologic/Stantec to use regional climate information, which has no relationship to water leaking from the Amador Canal, to analyze the flows in the creek.

If Ecologic/Stantec did not know the Amador Canal had a significant effect on the flows in Jackson Creek in late summer, they should have. When CDPH indicated that 20:1 dilution had to be maintained, they cited the dewatering of the Amador Canal as a serious concern.

Why Frogs?

For those who want to make fun of frogs stopping projects, please remember that the law requires endangered species to be protected. One of the best legal grounds for overturning an incompetent and/or dishonest report such as the BUAS is a demonstrable false statement about an endangered species. Ecologic/Stantec made such a false statement in the BUAS when they said there would not be any adverse impact on the Foothill Yellow Legged Frog (FYLF), as discussed below.

Also, the same false statements are found throughout the BUAS. The FYLF is just one of many examples of a false conclusion being made because of the malfeasance related to the hydrology of Jackson Creek, as discussed above.

Finally, the best reason for protecting the frogs and their habitat is because the option that maintains the biological resources of Jackson Creek is also the least costly for ratepayers.

Frogs

On page 6-19[8] in section 6.3.7 (Foothill Yellow-Legged Frog) of the BUAS, the Foothill Yellow-Legged Frog (FYLF) is discussed. The critical period for the eggs of this species extends through September. The BUAS says: "Between June 27 and October 3, FYLF tadpoles would likely inhabit flowing riffles (and on occasion may venture into deeper waters). Approximately once every 13-14 years in the absence of effluent, Jackson Creek could cease to flow during approximately 2 to 2.5 months (based on a retroactive analysis of flows)."

On page 6-21[9] the discussion continues: "In addition, during drought periods, tadpoles and frogs may be forced to congregate around remaining pools, leaving them more susceptible to predation. Therefore, during critically dry years, FYLF in Jackson Creek may experience lower reproduction rates and higher predation rates."

But actual flow data shows that drought conditions similar to 2008 will occur in every year because previous perennial conditions were maintained by leakage from the Amador Canal, not the regional climate. Therefore there will not be riffles in late summer and the FYLF populations along the creek will be destroyed. That is a significant adverse impact that can be easily avoided.

[8]Exhibit F1 is page 6-19 of the BUAS.
[9]Exhibit F3 is page 6-21 of the BUAS.

Prior Knowledge of Effect

The City of Jackson was aware of the effect of dewatering the canal on the creek. Jackson declined to sue the AWA to force it to consider the consequences of dewatering the canal and now finds itself responsible for the creek.

It is ironic that if the AWA had been forced to honestly evaluate the effect of dewatering the creek, they would have had to maintain a flow of 0.1 cfs at the WWTF to maintain perennial conditions. Had that happened, the conclusions of the BUAS would be true and the BUAS would not have been necessary. Instead of standing up for City residents, the City Council decided to let the AWA lie and say there would be no adverse impact on the creek.

That decision was apparently motivated by the belief that it would cost several hundred thousands of dollars to expose the AWA lie. It did not cost me that much, but the courts said that truth makes no difference. I was too late and the AWA got away with their lie. It does not matter that the creek dries up, except that now Jackson is caught in the trap of its own making. Cooperating with a travesty of justice cost the City at least $250,000 on a study that would not even have been needed if the creek had been kept perennial.

To be clear, I do not blame the Council for being worried about the cost of a lawsuit, but that is not what was really going on at the time. The Mayor dismissed the lawsuit on the morning of the day it was to be discussed at the Council meeting in the evening. That action was deliberate and intended to prevent Bud Lewis and I from taking overt the suit. The FYLF truly is a problem of the City's own making because the City went to extraordinary efforts to defeat an accurate assessment by the AWA. The BUAS did properly assess the threat to the FYLF and now the City must make up for the AWA's malfeasance.

Illegible Pages

Appendices A, B, C, D, and E are not legible. Please provide legible copies for the environmental document.

Scope

The scope of the BUAS is inadequate. Page ES-1[10] in section ES.1 (Historical Perspective and Existing Conditions) indicates that the pool survey area extended 4.1 miles downstream of the WWTF. That is not all the way to Lake Amador and the entire stretch of Jackson Creek between the WWTF and Lake will be affected. Furthermore, the gradient of the creek suddenly steepens immediately downstream of the "Dam (50 ft) and Small Lake", as shown in Figure ES-1 on page ES-1. That is because a different geologic formation is entered.

Page 2-9[11] in section 2.3.3 (Physical Habitat Data Collection Methods) asserts that a 1 mile

[10]Exhibit G is page ES-1 of the BUAS.
[11]Exhibit H is page 2-9 of the BUAS.

stretch of the creek is adequate to determine its response to becoming intermittent. No support is given for that assertion and such an approach can only be supported if the creek is uniform along the stretch between the WWTF and Lake Amador.

That stretch of creek is not uniform. Page 3-5[12] in section 3.4 (Geology And Soils) identifies three different bedrock formations. No information is provided concerning how pools form in the bedrock. Page 4-8[13] in section 4.2.4 (pH) contradicts that information by saying "Jackson Creek is located primarily in granitic and basaltic bedrock". That statement is inconsistent with the rock types discussed on page 3-5.

The stretch of Jackson Creek between the WWTF and Lake Amador is not uniform and the BUAS does not know what the actual rock are.

Negative Declaration

The City will be better off if it begins the CEQA process directly, without the assistance of Stantec. The City will be the Lead Agency and the final document will be binding on all public agencies.

A Negative Declaration (ND) will suffice if Jackson Creek is maintained as a perennial stream. That can be accomplished by an auxiliary reservoir, as I discussed in a previous letter dated December 26, 2010. If that auxiliary reservoir is also used to contain recycled water from the WWTF when required, no other facilities are required to meet the 20:1 dilution requirements. The CTR requirements cannot be used to compel removal of the recycled water from the stream and the auxiliary reservoir can be sized to avoid violating the CTRs.

Conclusion

The BUAS must be revised to indicate that removal of recycled water from Jackson Creek will result in a significant adverse impact to the Foothill Yellow-Legged Frog, and therefore some beneficial uses will not be protected by the proposed project.

The City should initiate the CEQA process to prepare a ND as soon as possible.

Sincerely,

[12]Exhibit I is page 3-5 of the BUAS.
[13]Exhibit J is page 4-8 of the BUAS.

(DDWEM) stated purpose is to "promote and maintain a physical, chemical, and biological environment that contributes positively to health, prevents illness, and assures protection of the public" (CDPH, 2009).

The CDPH Wastewater Disinfection guidelines under Category III state that "*where it is not possible to prevent a discharge [of treated wastewater] to freshwater rivers and streams the following disinfection recommendations apply: .... No discharge to domestic water supply should exceed a ratio of 20 parts downstream water flow to one part effluent*" (CDPH, 1987). As a result, the Jackson WWTP NPDES permit states that Lake Amador shall not exceed (on a monthly average) 5 percent effluent content.

1.5.4 California Department of Fish and Game (CDFG)

CDFG is the state trustee agency responsible for managing fish and wildlife resources, and enforcing the California Fish and Game Code and California Endangered Species Act. Biologist Ken Kundargi and Jim Harrington and Water Quality Scientist Carol Oz from Region 2 CDFG participated in the development and approval of the study design.

CDFG requested the BUAS to obtain information regarding fish and wildlife species inhabiting Jackson Creek and their potential dependence on the current, effluent-supplemented, flow regime in Jackson Creek. The data and findings from the BUAS are to assist CDFG and the City with decisions regarding potential changes in discharges and potential flow alterations in the creek.

1.4 FUTURE STEPS AND PHASING

The BUAS is the first step or phase in a process to define a compliant project for the City. The conclusions of this study will provide the basis for evaluating various wastewater disposal options available to the City to ensure consistent and reliable compliance. Once the regulatory agencies determine whether the City can comply with Board Order No. R5-20070133 and seasonally remove effluent from the creek, the City will (1) initiate an engineering feasibility analysis to assess alternative disposal options, (2) define a proposed project, (3) undergo environmental review process as required by the California Environmental Quality Act (CEQA), and then (4) implement a compliant project. The goal is to find a balance between compliance with the Clean Water Act, Safe Drinking Water Act, and California Fish and Game Code in the Jackson Creek watershed.

The two reaches below the WWTP were identified during reconnaissance surveys conducted in February 2008. In general, site selection was based on SWAMP requirements to ensure the reach fairly represented the area of creek under study. The upper two reaches were defined during pre-field surveys in June 2008. Reaches were selected based on the following criteria:

- Location (above and below the WWTP)
- Habitat diversity (presence of riffles, pools, runs and steps)
- Pool size (for effective fish shocking)
- Substrate (similarity between reaches)
- Riparian cover (similarity between reaches)
- Pool/riffle density (similarity between reaches)
- Accessibility

2.2.1 SITE LAYOUT

The four 150-meter reaches were studied using transects stationed in accordance with the SWAMP bioassessment and physical habitat protocol (Figure 2-3) (Ode, 2007).

2.2.2 STUDY SITE DESCRIPTIONS

Site 1 and 2 were located downstream of the WWTP and Site 3 and 4 were located upstream of the WWTP (Figure 2-2). Note: Lower site numbers indicate downstream locations.

Study Site 1 (654 ft elevation) is surrounded by fairly dense riparian habitat and mixed oak woodland. Grazing, vegetation management, and past mining activities influence the site. Site 2 (1080 ft elevation) is located in a grazed area with somewhat less riparian cover. Site 3 (1399 ft elevation) is relatively close (100-300 ft) from Hwy 88 and it had large areas of non-native vegetation along its banks and dense canopy cover. Site 4 (1329 ft elevation) was located on the South Fork of Jackson Creek in a rural area bordered by relatively dense riparian habitat and pastureland. **(Figure 2-4)**

2.3 DATA COLLECTION

The City conducted a pre-field desktop study and intensive field surveys to define the baseline and assess whether biological beneficial uses are being met under existing conditions. Water quality, physical habitat, and biological data were collected at multiple sites.

R1 = NPDES Water quality monitoring site **above the WWTP**

R2 = NPDES Water Quality monitoring site **below the WWTP**

2.3.1 FLOW DATA

Flow data was collected by the City using a continuous logging stream gauge near R1, immediately above the WWTP (Figure 2-2). In addition, effluent discharge flow rates (at the outfall) are logged every half hour and daily averaged calculated. Therefore, the combination of these two datasets provides the basis for estimating streamflow downstream of the plant. Streamflow data collection was initiated by the City in 2001 and therefore, the complete flow data set now covers eight years (2001-2009).

Section 7

Conclusions

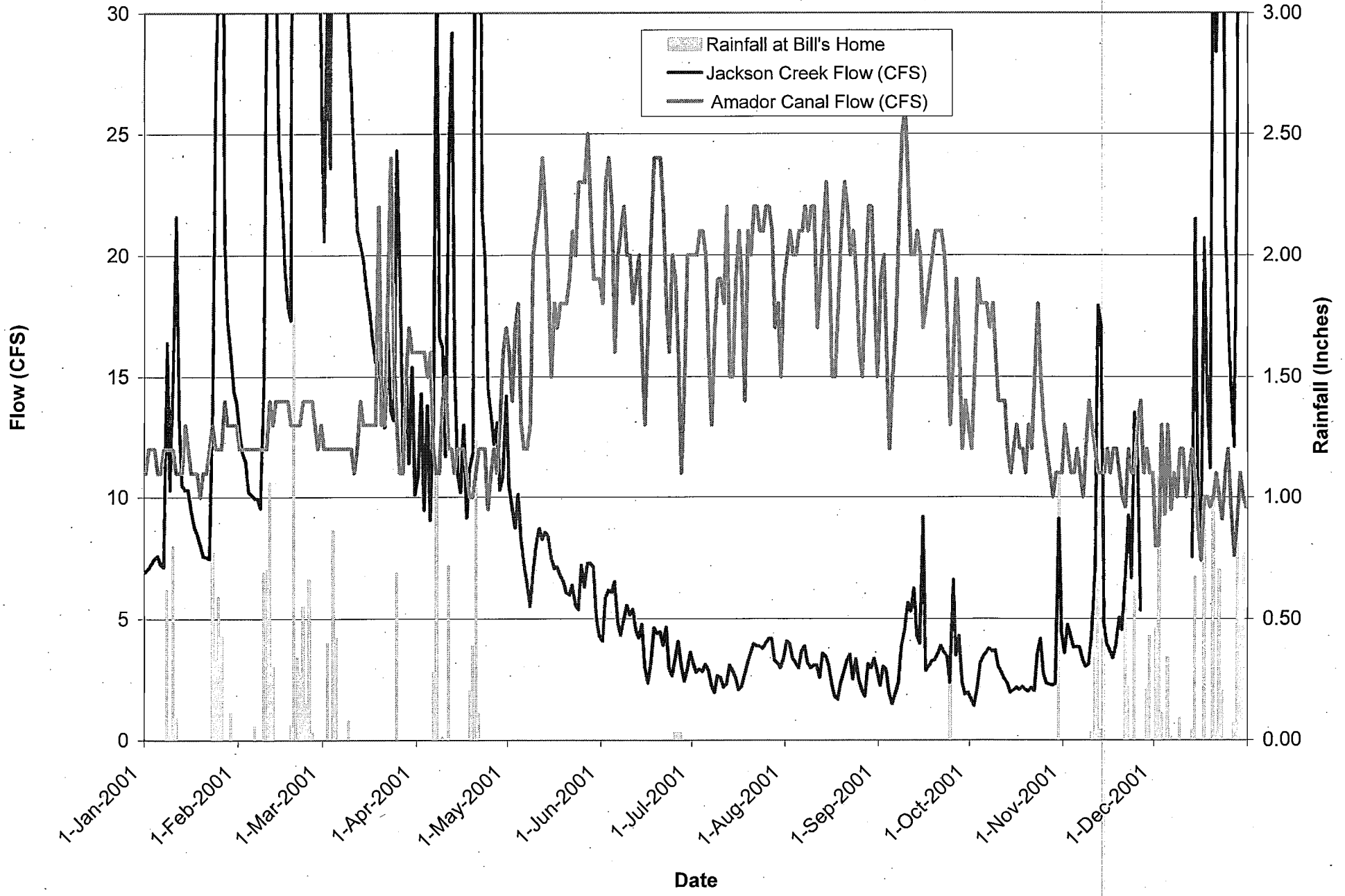
All the designated Beneficial Uses are currently being met under existing conditions. In addition, the reference site as well as the the historic streamflow versus critical life stage analysis indicated that biological and non-biological beneficial uses will likely continue to be met under a slightly lower flow regime.

The water quality impacts of effluent removal will likely be beneficial. Nutrient loading as well as the potential endocrine disrupting compounds would be seasonally eliminated. With respect to biological beneficial uses, the most sensitive species to water reductions encountered during this study were fish and amphibians. Of note are the coldwater fisheries and the foothill yellow-legged frog. Under a potential effluent removal scenario whereby the overall flow below the WWTP would be seasonally reduced by an ADWF of 0.32 cfs (0.5 mgd), the creek hydrology would further approximate the natural (background) hydrology. The effluent removal would likely result in improved water quality and slightly decreased habitat availability (wetted width) during most years. Like other common wildlife, Jackson Creek aquatic species may face a slight reduction in population size relative to the incremental decrease in late summer flows.

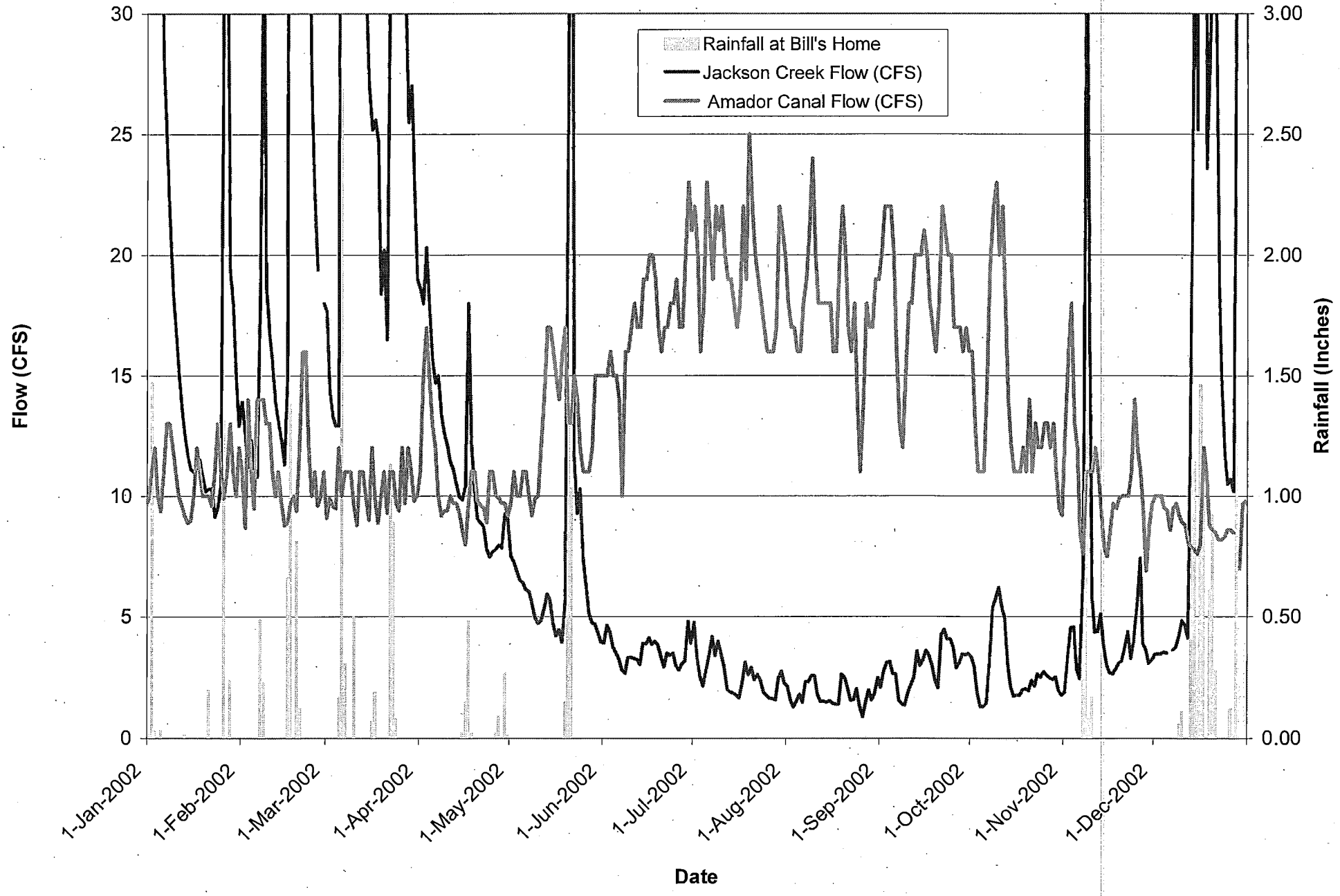
Of the aquatic and semi-aquatic wildlife encountered in the creek, only the two warmwater fish species (green sunfish and pikeminnow) and California red-legged frog (CRLF) have critical life stages that can extend into late summer. The warmwater fish species in Jackson Creek are extremely adaptable to variable water flow and quality conditions. CRLF individuals were not observed in the stream; however, its potential habitat was documented. This species spawns in pools with emergent vegetation. Because the majority of these pools are bedrock confined, they are expected to contain water throughout the CRLF breeding season (late June). Foothill-yellow legged frog reproduces in riffles and therefore is highly flow dependant; however, this species reproduces in early spring and larvae have typically hatched by June. Therefore, the species' critical life stage (ovoposition and development) when the risk of desiccation is highest occurs prior to the potential natural low flow periods (in the absence of effluent).

In addition, on rare occasion (on a statistical average of approximately every 13-14 years) critically dry conditions would likely result in (similar to 2008) approximately 1-2.5 months of low or no flow. Such an infrequent disruption to critical life stages is not considered significant because it would not likely result in the elimination of a species or population. During such infrequent natural low or no flow periods, the pool frequency, depth, and type (bedrock confined) will likely yield some ponding and deepwater regugia for most stream-associated species.

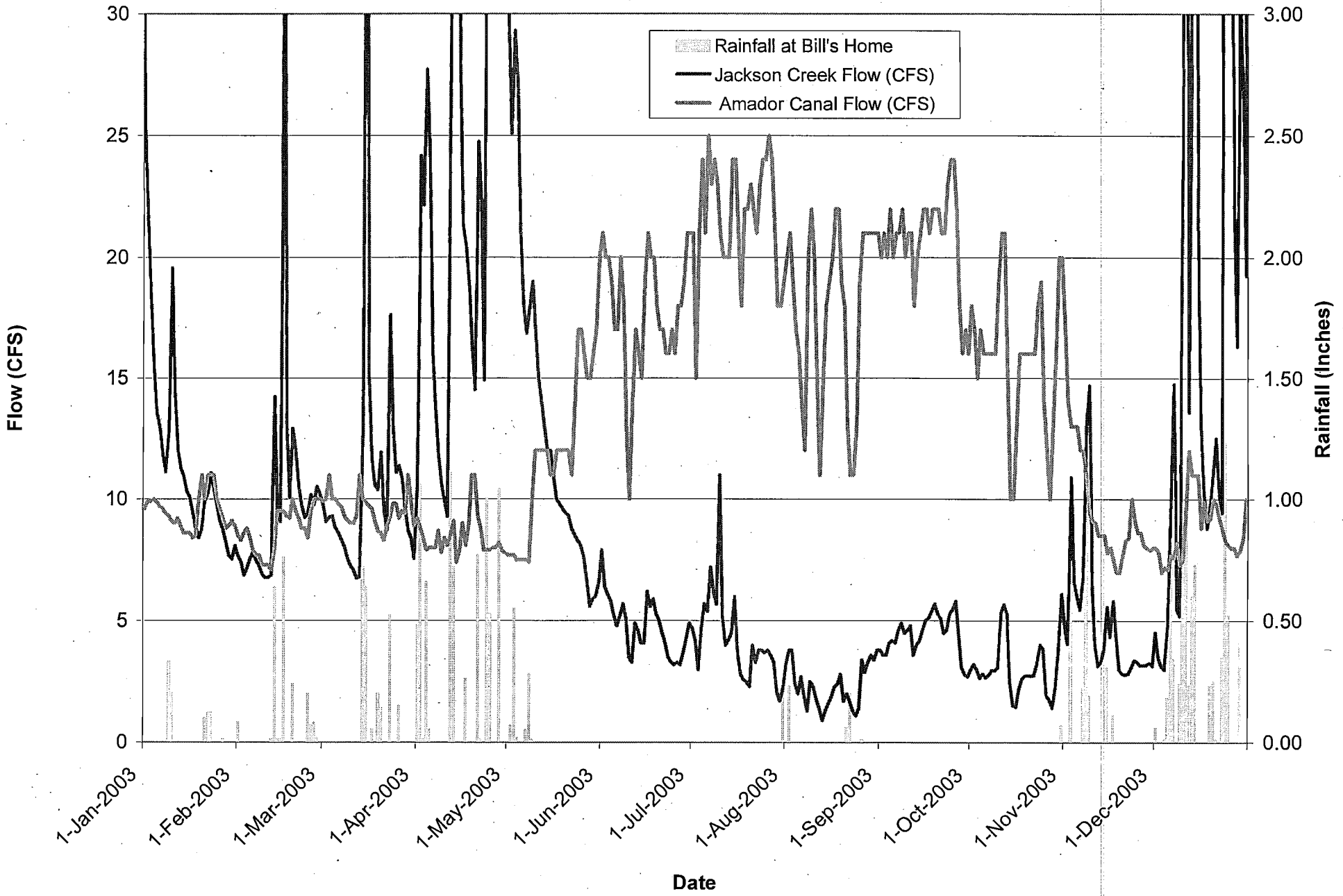
Amador Canal and Jackson Creek Flows for Year 2001
(Flow Data from EBMUD & City of Jackson)
Partial Annual rainfall (Ending June 30th, 2001): **16.99"**



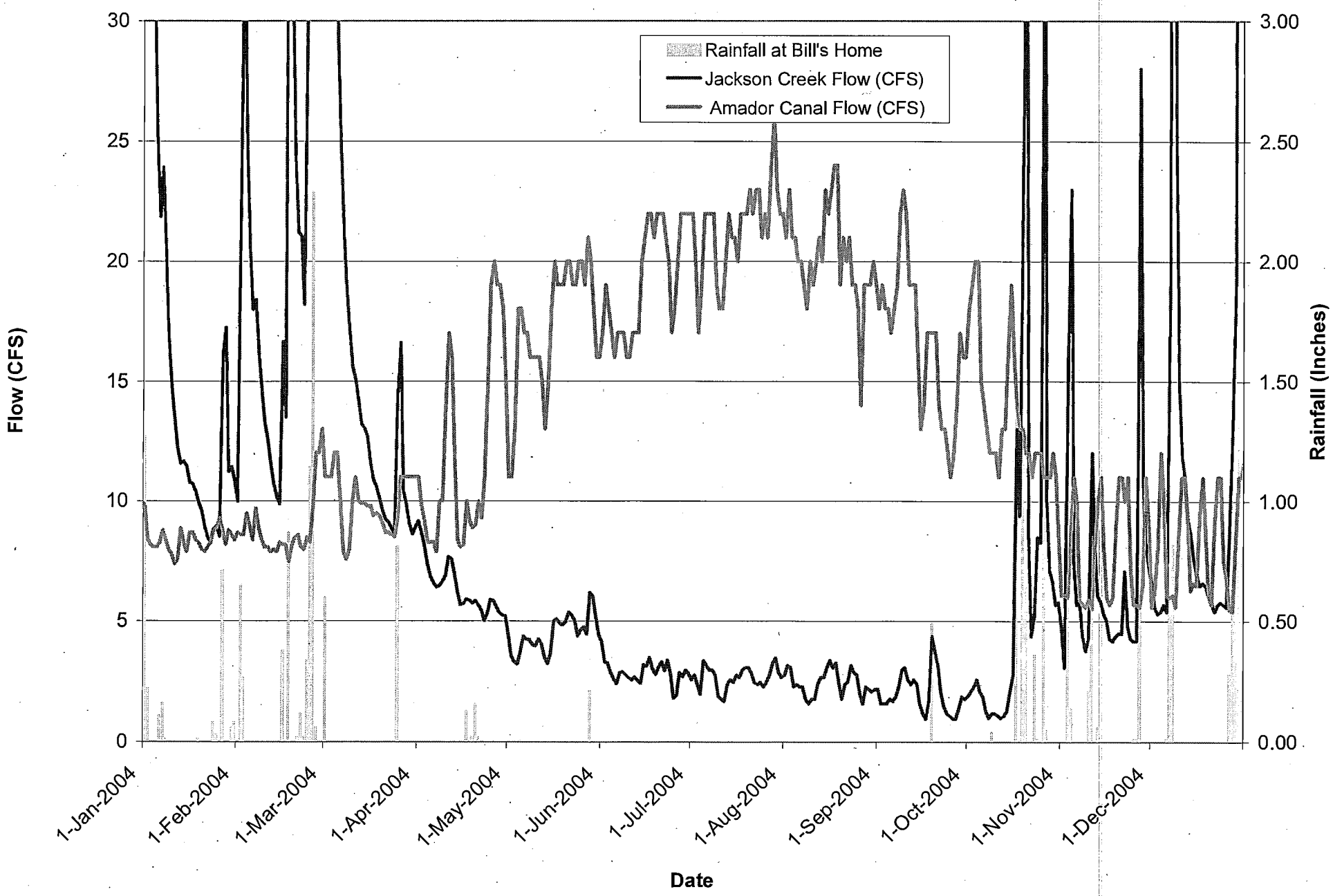
Amador Canal and Jackson Creek Flows for Year 2002
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2002): **30.06"**



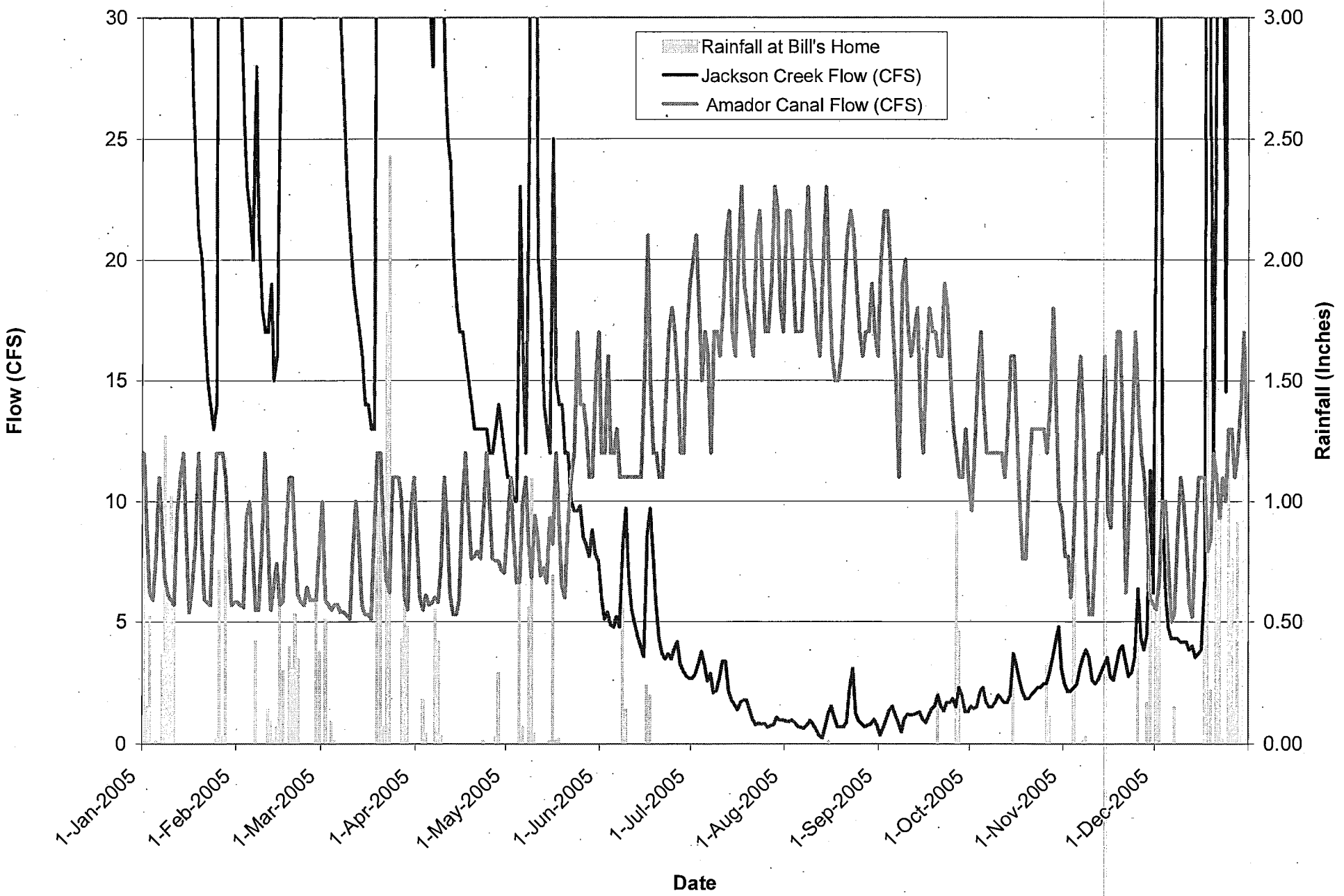
Amador Canal and Jackson Creek Flows for Year 2003
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2003): **26.89"**



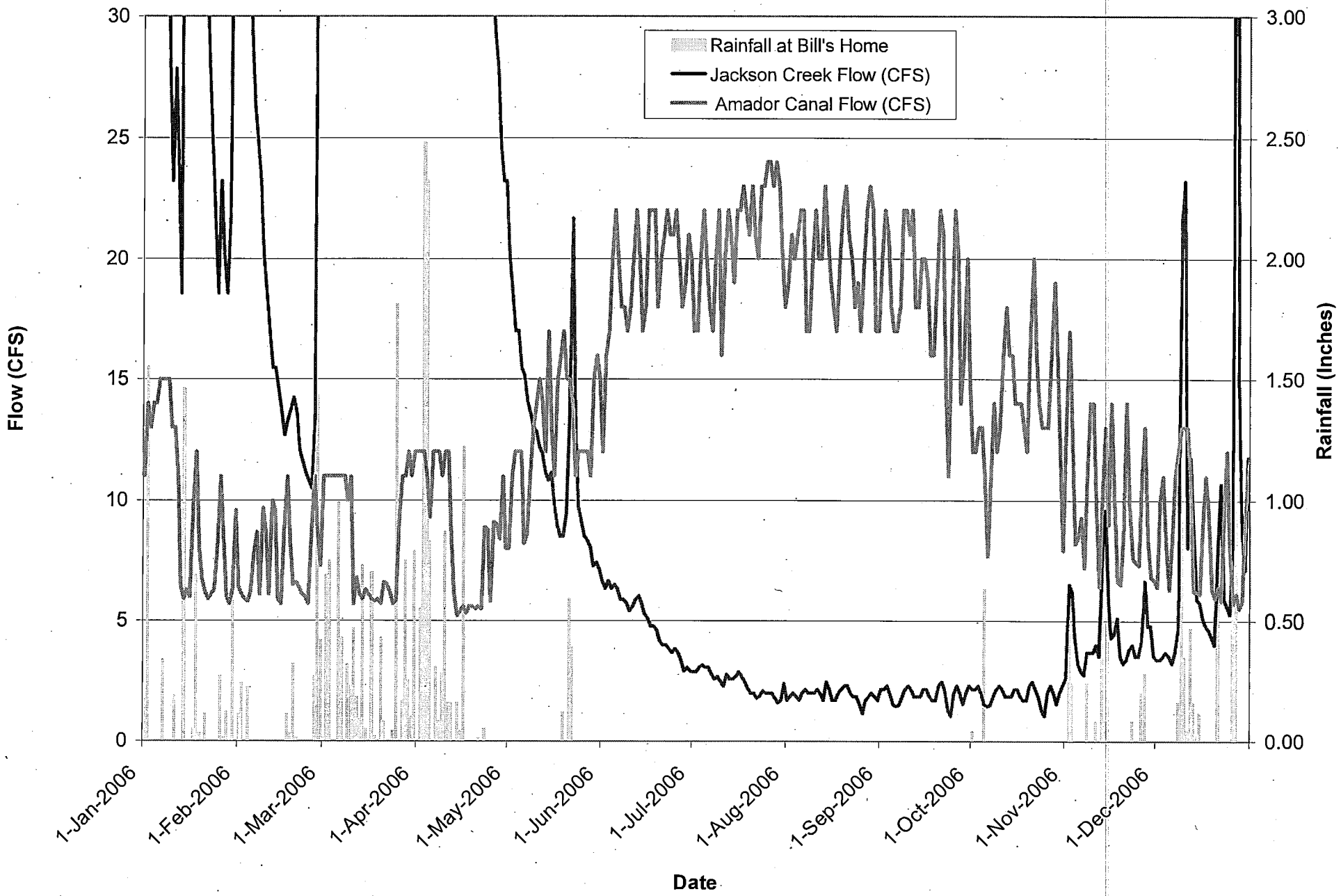
Amador Canal and Jackson Creek Flows for Year 2004
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2004): **22.83"**



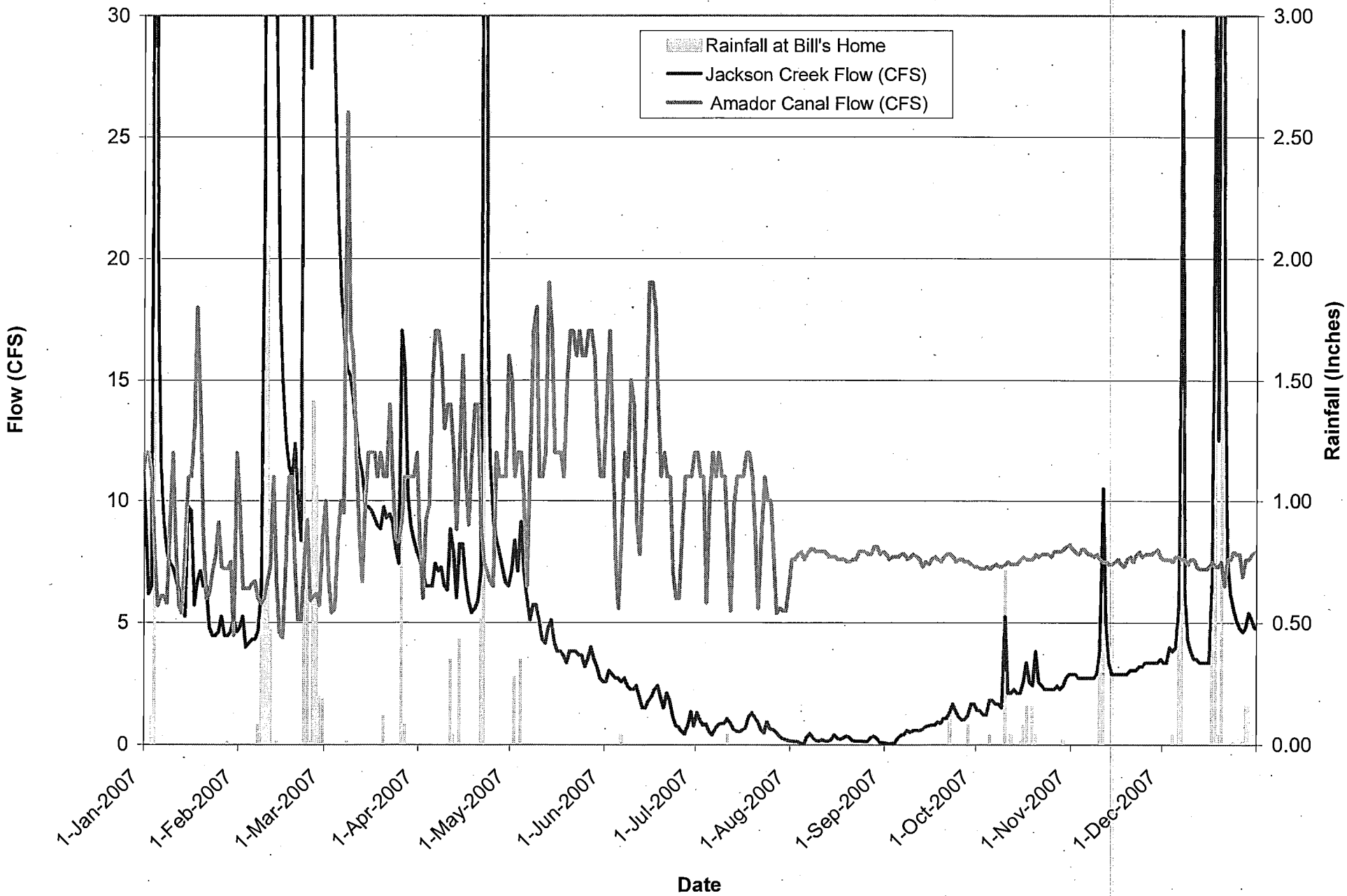
Amador Canal and Jackson Creek Flows for Year 2005
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2005): **40.58"**



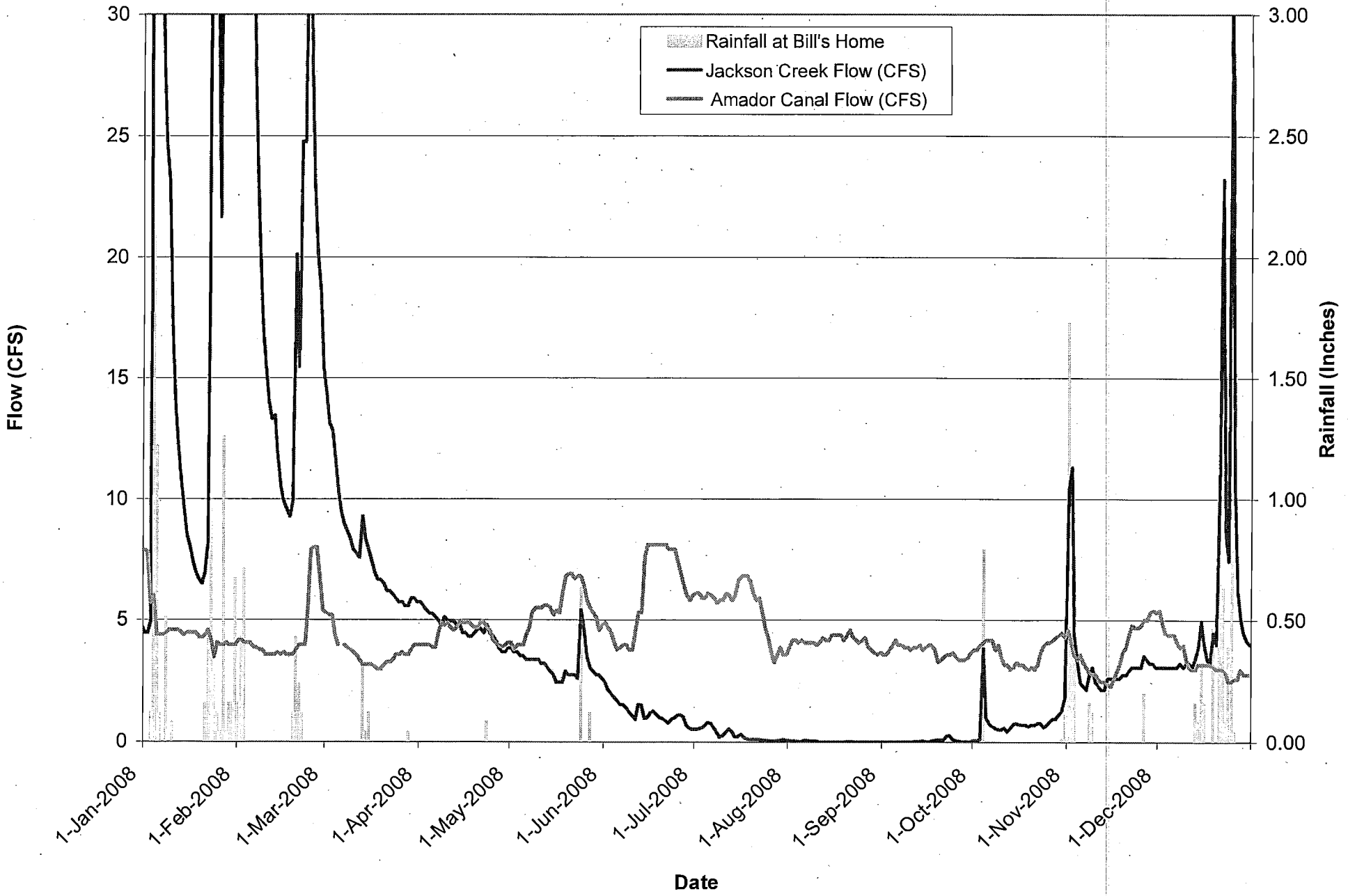
Amador Canal and Jackson Creek Flows for Year 2006
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2006): **47.10"**



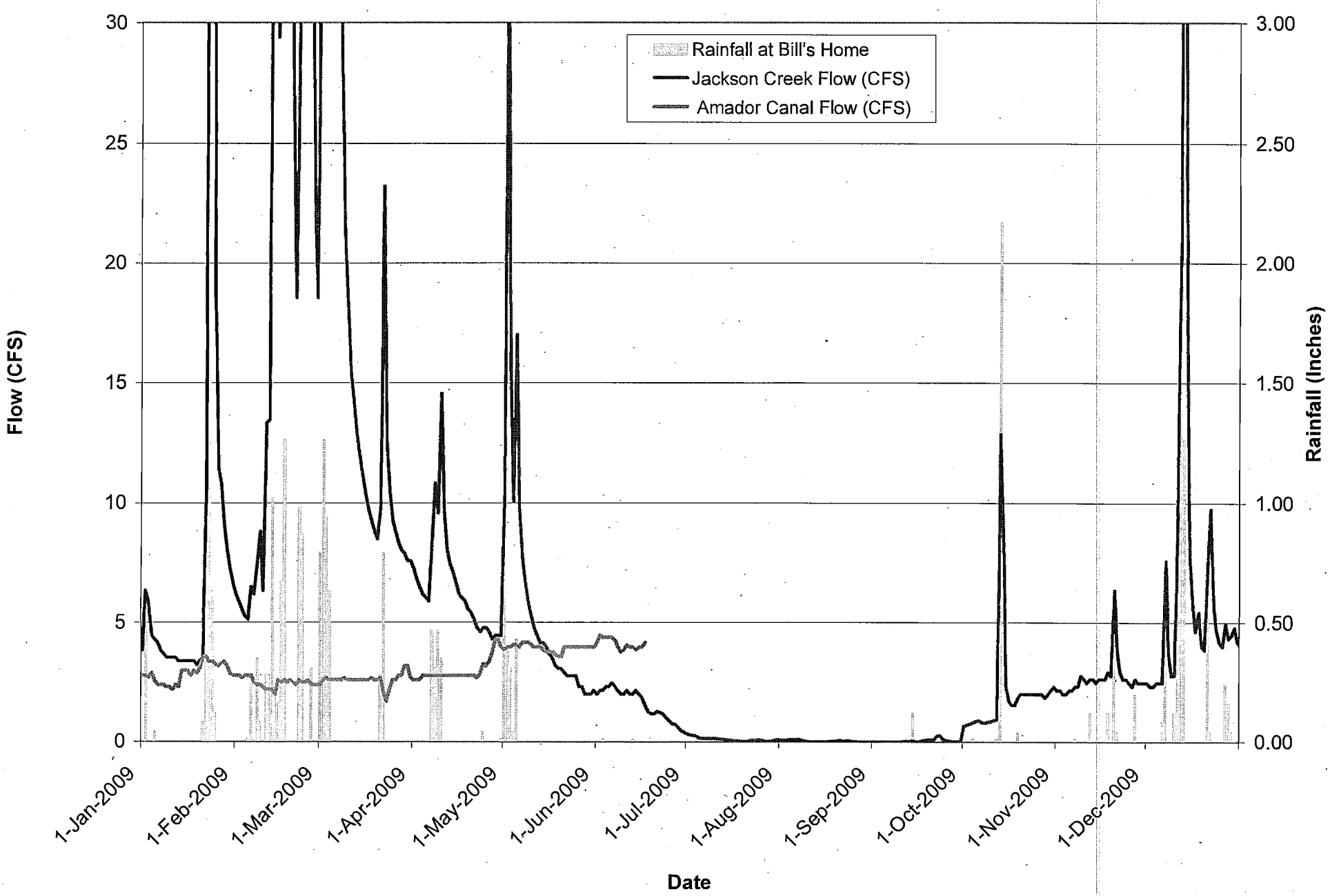
Amador Canal and Jackson Creek Flows for Year 2007
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2007): **23.58"**



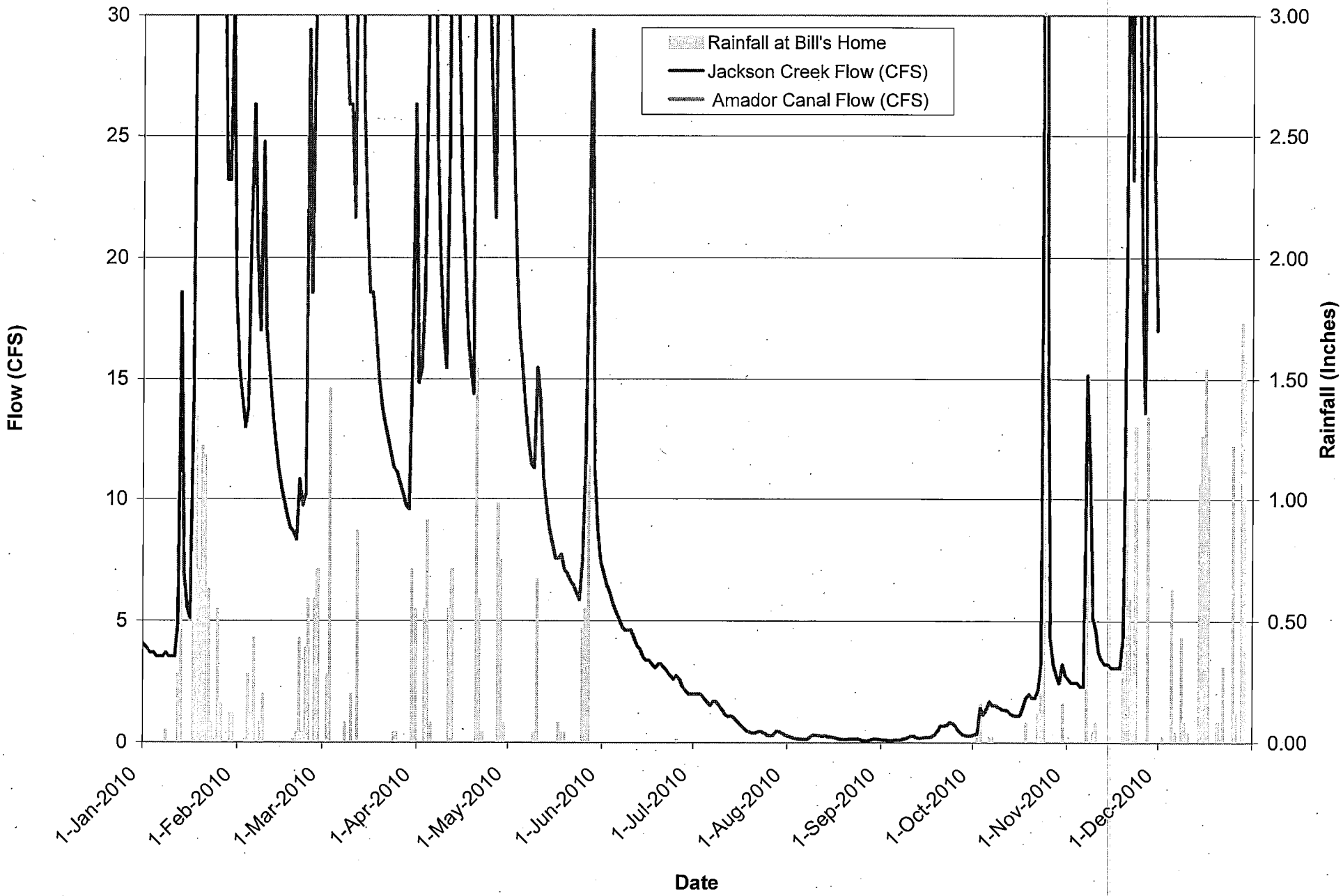
Amador Canal and Jackson Creek Flows for Year 2008
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2008): **20.17"**



Amador Canal and Jackson Creek Flows for Year 2009
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2009): **27.84"**



Amador Canal and Jackson Creek Flows for Year 2010
(Flow Data from EBMUD & City of Jackson)
Annual rainfall (Ending June 30th, 2010): **34.86"**



The vegetation along Jackson Creek varies from black oak/mixed coniferous forest in the upper reaches above the City to blue oak and interior live oak woodland in the lower areas, nearer Lake Amador. Specifically, below the City and the WWTP (Figure 3-1) the terrain surrounding the creek consists of rolling hills and some steeper canyon walls with banks dominated by annual grasses and interior live and blue oak woodland. With the exception of some urbanized areas above the WWTP and some grazed areas below the plant, almost the entire creek is lined by a relatively dense riparian zone of predominantly alders and Oregon ash with interspersed cottonwoods.

3.2 CLIMATIC SETTING

Precipitation and water runoff records provide the context for understanding the baseline flow conditions during the Jackson Creek BUAS. The spring of 2008 was the driest on record according to DWR and was the second of two consecutive drought years. Beneficial uses are often stressed under drought conditions and therefore the timing of this study was opportune because it yielded data on the creek system under extreme dry and low flow conditions.

Jackson Creek has a temperate climate with warm to hot summers and moderate to cold winters. The area receives on average about 31 inches of rain per year based on meterological data from the nearby Electra Powerhouse. The majority of rain falls in the winter months (AWA 2000).

3.2.1 STUDY YEAR - PRECIPITATION CONTEXT

Southern Sierra Composite Index (DWR, 2009)

Based on composite records throughout the state, the combined two year 2007 and 2008 water year precipitation total was 72.1" and constitutes the driest 2-year total in 88 years of record (DWR, 2008). In addition, the total single 2008 water year (October 1, 2007 to September 1, 2008) ranked as the 15th driest year in the 88 years of record. The total 2008 spring and summer (March – September) precipitation was only 3.5 inches. This constitutes the driest spring on record (88 years).

Local Rain Data (DWR, 2009)

Local historical rain data are limited. The closest rain gauge is located to the southeast of the WWTP is at PG&E's Electra Powerhouse. It has records from 1951 to 1997. The NOAA gauge at the City Plymouth has data from 1990-2000. The nearest long term continuously logging NOAA rain gauge is the Camp Pardee site, located within 8 miles of Jackson Creek. It has daily precipitation records from 1951-2008. Based on these local rainfall data, the combined rainfall totals in years similar to 2006-2008 (i.e., < 15 inches of annual rainfall) have occurred only three other times in the last 57 years. The average recurrence interval is therefore approximately 13 to 14 (~13.6) years (Figure 3-2).

6.3.7 FOOTHILL YELLOW-LEGGED FROG (*RANA BOYLII*)

Relative to Basin Plan Beneficial Uses, foothill yellow-legged frog (FYLF, *Rana boylii*) is important because it represents a wildlife beneficial use and it is currently listed as a California Species of Special Concern. This species is extremely riffle dependant for its reproduction and reproduction generally occurs between May and June. At hydro electric facilities rapidly falling river levels put eggs at risk of desiccation by stranding them on land as the water recedes (Kupferberg 1996). However, under natural flow regimes when lower levels occur along a regular stream hydrograph, *R. boylii* has be observed to oviposit earlier in the breeding season during drought years (Kupferberg 1996). Due to this species' riffle dependence, flow rates are key to survival.

Foothill yellow-legged frog

Currently Present? – Yes, single individual encountered below the outfall

Semi-aquatic (amphibian) Species

Habitat Requirements

- Shallow, flowing water in small to moderate sized streams
- cobble sized substrate for egg laying
- feed primarily terrestrial and aquatic insects

Critical life-stage
Mate and oviposit May until June. Tadpoles for 3 months (July – October) require water.

Migration capabilities slow and relatively stream confined, adults can move overland to ponds or springs; however, generally faithful to stream zone.

Refugia: Pool may form refugia; however, density dependent controls and bullfrog predation may affect population numbers.

Adaptations to Intermittent Conditions -
Primarily perennial, observed to spawn early during drought years

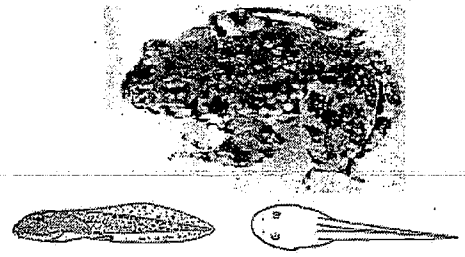
Reference Site Analysis

Upstream of the WWTP is estimated to be an indicator of the water quality and habitat conditions of Jackson Creek with no effluent. No FYLF were documented in one mile of VES surveys above the WWTP. Only one (1) adult individual was encountered downstream and it was located at Site 1 (Figure 4-27). These numbers are likely to small to make any definitive estimated with respect to the study area and reference stream. The habitat appeared suitable above the WWTP and it is unknown why no FYLF were encountered. Therefore, no definitive conclusions can be drawn. Therefore, the streamflow analysis cross referenced with life history requirements is a preferable method to assess potential no effluent conditions impacts to this species. However, because the removal of effluent will reduce the flows in the creek by 0.32 cfs (ADWF), the habitat available to this species will also decrease and some loss of individuals is expected.

Historic Flow - Climate and Critical Life Stage Analysis

FYLF have a critical life stage that occurs immediately prior to summer. Mating and oviposition typically occur from May until early June (CITE). It then typically takes an additional 3 months to metamorphose. This means that during between June 27 and October 3rd FYLF tadpoles would likely inhabit flowing riffles (and on occasion my venture into deeper waters). Approximately once every 13-14 years in the absence of effluent, Jackson Creek could cease to flow during approximately 2 to 2.5 months (based on a retroactive analysis of flows). It is known that under natural flow regimes FYLF has been observed to oviposit earlier in the breeding season during drought years (Kupferberg 1996a).

Foothill yellow-legged frog (*Rana boylii*) Natural History



Status – Native, California Species of Special Concern

Geographical Range
Ranges from northern Oregon west of the Cascades south along the coast to the San Gabriel Mountains, and south along the western side of the Sierra Nevada Mountains to Kern County, with an isolated populations in Baja.

Habitat Description
Shallow, flowing water in small to moderate sized streams with cobble sized substrate for egg laying. FYLF's core habitat is perennial streams in riparian woodland/scrub, grassland, oak savanna, and oak woodland land cover types. FYLFs are found close to water that retains perennial pools through the end of summer.

Nutrition
Nussbaum *et al.* (1983) reports that the diet includes flies, moths, hornets, ants, beetles, grasshoppers, water striders, and snails. Terrestrial arthropods (87.5% insects, 12.6% arachnids) were the primary prey items of recently metamorphosed foothill yellow-legged frogs at a single site studied by Van Wagner (1996). Storer (1925) and Fitch (1936) note that terrestrial and aquatic insects are probable food for post-metamorphic frogs (Fellers 2005) (Stebbins, 2003; Fellers, 2005; CaliforniaHerps, 2009).

Reproduction
Mating and egg-laying occurs in water from mid March until June after streams have slowed from winter runoff. Under natural flow regimes, R. boylii has been observed to oviposit earlier in the breeding season during drought years (Kupferberg 1996a). In rivers, breeding areas are often located within relatively close proximity to the confluences of tributary streams, both perennial and ephemeral streams with permanent pools (PG&E, 2002). Oviposition sites are generally shallow, slow-moving water with a cobble or pebble substrate that is used to anchor each egg mass. On occasion, egg masses may be attached to aquatic vegetation, woody debris, and gravel. Masses are usually attached to the downstream side of rocks, at the stream margin, and at depths of < 0.5 m (Stebbins, 1985; Fuller and Lind, 1992; Ashton et al., 1998).

Life Cycle Stages
Foothill yellow-legged frogs in California generally breed between March and early June (Storer 1925, Grinnell et al. 1930, Wright and Wright 1949, Jennings and Hayes 1994). After oviposition, a minimum of approximately 15 weeks is required to reach metamorphosis, which typically occurs between July and September (Storer 1925, Jennings 1988). Tadpoles generally occur in the same locations and habitat as that used for breeding and egg deposition, and young tadpoles appear to have some fidelity to the original egg mass site (Ashton et al. 1998). Young, post-metamorphic frogs tend to migrate upstream from their hatching site (Twitty et al., 1967). As with juvenile FYLFs, adults are typically absent from stream margins by November or December through the remainder of winter.

Water Quality –Related Habitat Requirements

Table 6-5
Water quality parameters relative to Foothill yellow-legged frog (*Rana boylii*)

Parameter	Range	Preference
Temperature	9-21 oC (Zweifel, 1955)	Embryo critical thermal max = 26C
DO	tolerate DO levels less than 1 mg/L (Moyle 2002).	
Flow Velocity	Oviposition at flows of 0.0 to 0.21 m/second. (<1 ft/sect) Kupferberg (unpub. data)	

In addition, during drought periods, tadpoles and frogs may be forced to congregate around remaining pools, leaving them more susceptible to predation (Moyle 1973, Hayes and Jennings 1988). Therefore, during critically dry years, FYLF in Jackson Creek may experience lower reproduction rates and higher predation rates.

6.3.8 California Red-legged Frog (habitat)

Relative to Basin Plan Beneficial Uses, California red-legged frog (CYLF) is important because it is wildlife and it is listed under the Federal Endangered Species Act as *threatened.* The species was not documented during field surveys despite numerous pools in the creek and due to the high number of bullfrogs (a veracious predator of CRLF), it is highly unlikely the species exists in the system. The nearest known occurrence of CRLF is in Valley Springs, Calaveras County. However, because potential habitat was present at several sites above and below the WWTP, and potential habitat is protected under the Federal ESA, this species was included in the analysis.

California red-legged frogs live in a Mediterranean climate, which is characterized by temporal and spatial changes in habitat quality. In addition to climatic fluctuations, the habitats used by this species typically change in extent and suitability in response to the dynamic nature of floodplain and fluvial processes. Therefore, the frog uses a variety of areas, including various aquatic, riparian, and upland habitats. However, breeding habitat must contain water until mid-summer to ensure that pool breed tadpoles metamorph before the pond goes dry. Once metamorphed, CRLF have a variety of adaptations to deal with the Mediterranean climate.

Reference Site Analysis

No CRLF were encountered upstream of the WWTP; however, habitat was present and in the absence of effluent remained ponded in July and mid-August. Therefore, based on the reference site comparison it would be expected that CRLF habitat below the WWTP would also survive the absence of effluent. However, because the removal of effluent will reduce the flows in the creek by 0.32 cfs (ADWF), the habitat available to this species will also decrease and some loss of individuals is expected.

California red-legged frog

Currently Present? – None observed – Potential habitat present in large pooled areas.

Semi-aquatic (amphibian) Species

Habitat Requirements

- Still or slow moving habitats with emergent vegetation for breeding
- Ponds must hold water through
- summer to complete metamorphosis
- cobble sized substrate for egg laying
- feed primarily terrestrial and aquatic insects

Critical life-stage
Mate and oviposit January – March. Tadpoles for 3 months (May-June) require water.

Migration capabilities slow and relatively stream confined, adults can move overland to ponds or springs; however, generally faithful to stream zone.

Refugia: Pool may form refugia; however, density dependent controls and bullfrog predation may affect population numbers.

Adaptations to Intermittent Conditions
Can migrate to summer habitat

Executive Summary

ES.1 HISTORICAL PERSPECTIVE AND EXISTING CONDITIONS

The City of Jackson (City) wastewater treatment plant (WWTP) was constructed in 1936. Since that date, effluent has augmented natural flows in Jackson Creek. Currently the City discharges an average dry weather flow of approximately 0.5 million gallons per day (mgd)/ 0.32 cubic feet per second (cfs) of tertiary treated municipal wastewater to Jackson Creek. The wastewater treatment plant and outfall are located approximately ¾ mile below town and 6.3 miles above Lake Amador. Lake Amador is operated by Jackson Valley Irrigation District (JVID) for both irrigation and municipal uses. In general, Jackson Creek is effluent dominated in summer months while effluent comprises only a small proportion of flows during late fall and winter months.

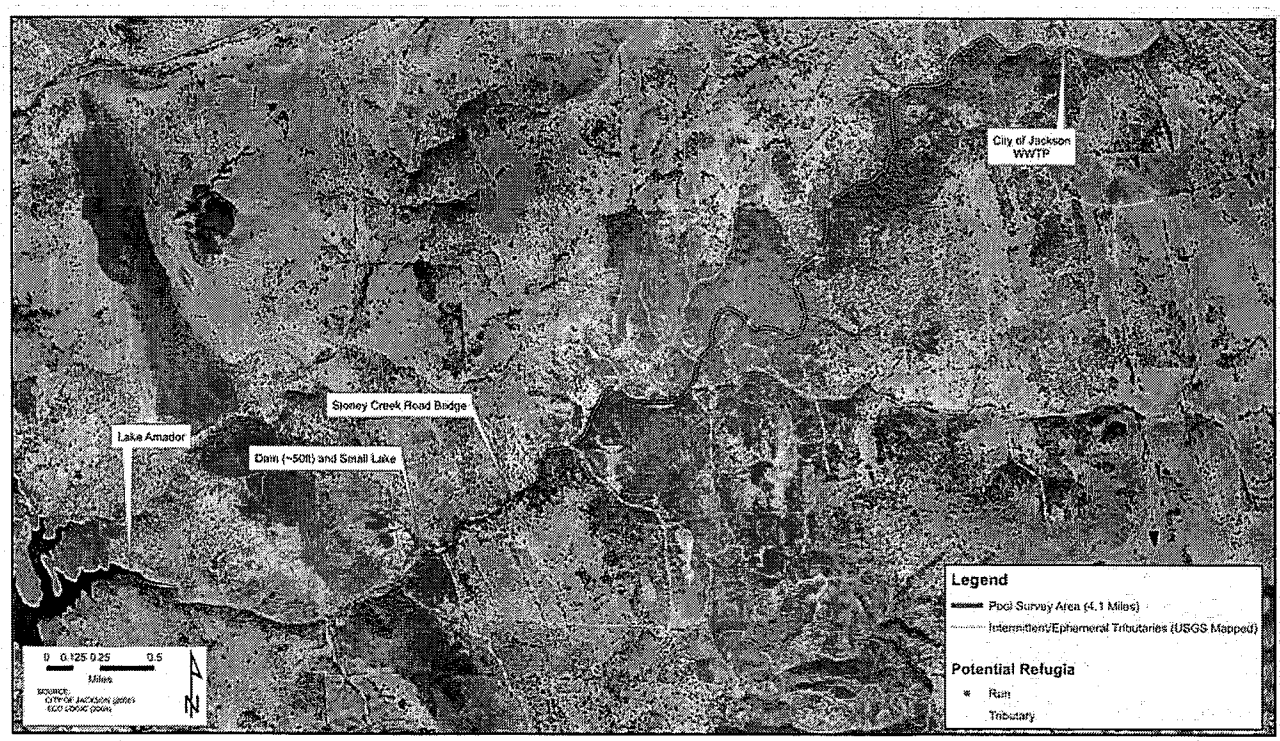


Figure ES-1
Project Study Area

June to October 2008. Flows were estimated using the neutrally buoyant object method outlined in the SWAMP protocol (Ode, 2007).

Element 3 - Continuous Logging Temperature

To document water temperature conditions upstream and downstream and determine if fishery-related beneficial uses are being supported, Hobo® continuous logging temperature probes were installed at six locations in the creek (Figure 2-2). The probes documented water temperatures every 30 minutes. Probes were located near each of the biological study transects and collected data from June to December, 2008. Average daily temperatures were calculated and analyzed.

Water Quality Element 3
Data Type: *In situ* temperature data
Location: Ross Bridge, Cipriano Bridge and Stoney Creek Bridge
Duration: June to December 2008

Element 4 -SWAMP Water Quality Data Points

A single ambient water quality (DO, Ph, Turbidity) collection event at the target reaches was conducted concurrent with the spring SWAMP bioassessment survey using a YSI 556 MPS and Hatch 2100P Turbidimeter.

A single set of flow data was also collected during the SWAMP study (June 2008) using a Marsh-McBirney Model 2000 Portable Flowmeter.

Note: The data sets with the most data points (n) were utilized for the water quality analysis (Elements 1 -3). The single data points collected during the SWAMP surveys (Element 4) were utilized for QA/QC and are included in raw data form in the appendices.

2.3.3 Physical Habitat Data Collection Methods

Pool/Refugia Assessment Methods

On November 10, 2008, ECO:LOGIC staff conducted field surveys to map the pools/potential refugia. A single mile of mapping was necessary to estimate a pool density; however, the survey extended along 4.1 stream miles of Jackson Creek between the WWTP and Stony Creek Bridge. The survey was conducted at the end of the dry season after the first rain of the year. By the date of the survey the region had experienced approximately 0.3 accumulated inches of rainfall during a single storm (DWR, 2008). Spatial data was gathered using Trimble GeoXH and Garmin Etrex Vista C GPS units. Pools were defined in accordance with SWAMP Bioassessment/Phab methods (Ode, 2007) and the minimum depth was 1.5 feet. The following pool habitat assessment data was collected along the study reach:

Pool Depth -Thalweg depths (including Max Depth) were measured with a Meter Stick and averaged (minimum of 3 depths per pool).

sea level). The headwaters of the middle fork of Jackson creek are located near the town of Pine Grove off of Highway 88. The south fork of Jackson Creek is also located at a similar elevation to Pine Grove but located south of Pine Grove and north of the Mokelumne River. Winter, spring, and summer flows are primarily a result of rainfall, and rainfall recharged shallow groundwater. Jackson Creek is a perennial stream, a stream whose channels during typical years contain some flowing water year round (USGS). Figure 3-3 depicts the Jackson Creek hydrograph for flows just above the WWTP discharge site (at R1) and the effluent flow rate between 2001 and 2007. Peak streamflow events occur primarily during winter in response to rainfall events and then general decrease overtime during summer and fall. The creek was effluent dominated (> 50 percent effluent) from mid- July through October of most years.

3.4 GEOLOGY AND SOILS

Jackson Creek lies within the Sierra foothill metamorphic belt which consists of a strip Mesozoic sedimentary and volcanic rocks that have been highly metamorphosed by the geological processes which formed the Sierra Nevada mountain range.

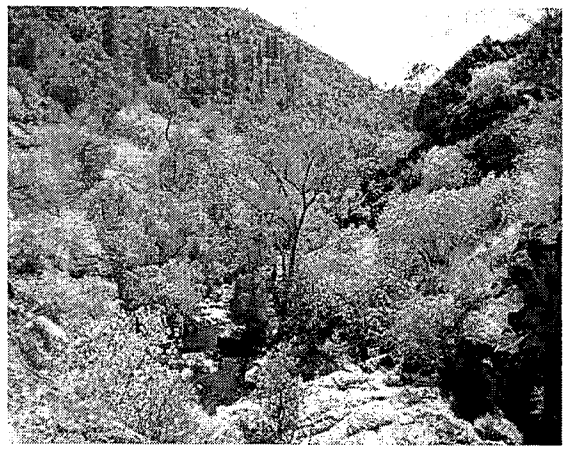


Photo 3-1
Steep gradient, bedrock confined area along Jackson Creek (view facing west)

Three major rock sequences found in the watershed directly influence the resultant soil types: 1) The Calaveras Formation is exhibited as highly contorted, poorly bedded, blackish-grey recrystallized cherts, quartzites and greenstones, low-grade carbonaceous slates, mica schists, and limestone. From these parent rocks the Auburn, Exchequer, Josephine, Mariposa, and Maymen soils have developed. 2) The Amador (Cosumnes and Logtown) Formation is stratigraphically the lowest and consists of metamorphosed sandstones, conglomerates and volcanics. Upon decomposition these rocks yield the Argonaut, Auburn, and Exchequer soils. 3) The Mariposa Formation is dominated by marine sediments that have been metamorphosed into slate and results in the Auburn and Exchequer soils types upon decomposition.

3.5 BIOLOGY

Prior to conducting fieldwork, ECOLOGIC biologists conducted a site screening process using the California Natural Diversity Database (CDFG, 2008). Nine special-status species were identified; however, the majority of the species are associated with Ione Chaparral, which is not water dependent and not associated with creek habitats (Figure 3-4). The key special-status species expected to occur in the area based on CNDDB data and foothill habitats found around the creek include western pond turtle, foothill yellow-legged frog, California red-legged frog, and valley elderberry beetle (Table 3-2).

BUAS Continuous Logging Water Quality Sites

DO levels in Jackson Creek approximately five miles upstream of the WWTP at Ross and Cipriano bridges were between 6.8 and 10.1 mg/l (Figure 4-7). DO levels 4.4 miles below the WWTP outfall ranged between 5.8 to 9 mg/l (Figure 4-7). DO levels during summer months below the WWTP were low but still within the cold water fisheries tolerance limits (Raleigh R.F. *et al.* 1986). *Refer to Section 6 for a species specific analysis of DO tolerances relative to the stream conditions.*

4.2.4 pH

pH is one of the most common water quality tests performed for water quality assessments. pH indicates a water sample's acidity, but is actually a measurement of the potential activity of hydrogen ions (H+) in the sample. pH measurements run on a scale from 0 to 14, with 7.0 considered neutral. Solutions with a pH below 7.0 are considered acids. Solutions with a pH above 7.0, up to 14.0 are considered bases. All organisms are subject to the acidity of stream water and function best within a given range. The pH scale is logarithmic, so every single unit change in pH actually represents a ten-fold change in acidity. In other words, pH 6.0 is ten times more acidic than pH 7.0; pH 5 is one hundred times more acidic than pH 7.0.

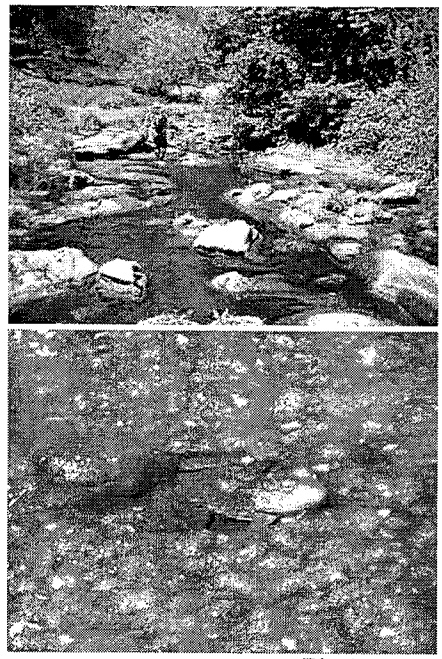


Photo 4-2
Macroalgae bloom below the WWTP in June 2008. Photos approximately 4.4 miles downstream

The pH of a body of water is affected by several factors. One of the most important factors is the bedrock and soil composition through which the water moves, both in its bed and as groundwater. Some rock types such as limestone can, to an extent, neutralize the acid while others, such as granite, have virtually no effect on pH. Jackson Creek is located primarily in granitic and basaltic bedrock.

Another factor which affects the pH is the amount of plant growth and organic material within a body of water. Aquatic plant production including algae blooms (such as that of *Cladophora sp.* and *Spirogyra sp.* observed in Jackson below the WWTP, Photo 4-2) can cause temporary increases in pH. During photosynthesis, carbon dioxide (CO_2) and water are converted by sunlight into oxygen and carbohydrate. Hydroxyl ions (OH^-) are produced, raising the water column pH. In addition, plants use a large amount of dissolved CO_2 for photosynthesis, resulting in lower levels of carbonic acid (H_2CO_3) in the water column. Thus, photosynthesis during green algae blooms can increases water column pH (Tetra Tech, 2007).

The "normal" pH range in streams is from 6 to 9 (Tetra Tech, 2007). Extremely high or low pH values in streams are harmful to aquatic organisms. For example, high pH levels can be toxic to fish and other organisms. High pH levels damage fish gills, eyes, and skin, and affect fish reproduction. High pH levels also increase the toxicity of some substances, such as ammonia. Low pH levels can

ECO:LOGIC
ENGINEERS · CONSULTANTS

City of Jackson- Jackson Creek Beneficial Use Assessment
Technical Memorandum No. 1

Beneficial Use Assessment Study Preliminary Findings and Proposed Analysis Methods

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Date: October 17, 2008

1.1 PURPOSE AND SCOPE

The purpose of this technical memorandum is (a) to present the preliminary findings from the pre-field screening (CNDDB, 2008) and the June and July, 2008 biological field component of the Jackson Creek Beneficial Use Assessment Study (BUAS), and (b) to outline the City's proposed methods of analysis. It should be noted that the findings presented here are preliminary. The complete BUAS report will be submitted to the Board well in advance of the February 27, 2010 compliance date (i.e., 18 months from the August 27, 2008 workplan approval date).

1.2 PRELIMINARY FINDINGS

During the June and July, 2008 field surveys which utilized the Surface Water Ambient Monitoring Program (SWAMP) protocols, the single pass electro-shocking, and the Visual Encounter Survey for amphibians, the following aquatic species were documented:

- Pike minnow (above and below the outfall)
- Green sunfish (above and below the outfall)
- Brown trout (in reaches above the City)
- Rainbow trout (in reaches above the City)
- Foothill yellow-legged frog (single individual near Stony Creek Bridge)
- California red-legged frog (POTENTIAL HABITAT ONLY)
- Bullfrog (all four reaches)
- Pacific chorus frog (below the outfall)

- Western pond turtle (all four reaches)
- Sierra Nevada garter snake (near Stony Creek Bridge)
- River otter (all four reaches)
- Crayfish (all four reaches)

Note: Benthic macro invertebrate (BMI) taxa are currently being analyzed.

In addition, several riparian-associated species were documented either through direct observation, indirect evidence of their presence (i.e., scat, nests, or prints), or anecdotal evidence from local landowners. These species include riparian/stream-associated avian species (i.e., American dipper, belted kingfisher, great blue heron, etc.) and riparian-associated terrestrial species (i.e., deer, coyote, mountain lion, raccoon, rattle snake, etc.).

Physical barriers to instream migration were also documented, the largest of which is a 30+ foot dam located below Stony Creek Bridge and above Lake Amador. It constitutes a complete barrier to fish migration upstream from Lake Amador.

1.3 METHOD OF ANALYSIS

Our analytical approach is to review current species distribution and community attributes in the study area, the habitat conditions currently supporting these species and communities, and the sensitivity and responses of these species and communities to the expected habitat changes. This will provide the basis for selecting the key habitat and biological attributes that define current beneficial uses and the potential effect of the WWTP discharge removal on these uses.

Specifically, given our preliminary findings, the biological team proposes the following method of analysis:

1. **Describe Baseline Conditions:** Describe species occurrences, community attributes, and spatial/temporal patterns in flow (including annual and seasonal variability), water temperature, water quality, and physical habitat currently supporting these species, communities, and associated beneficial uses in Jackson Creek.
2. **Identify Key Evaluation Species And Communities**: Identify key evaluation species and community attributes based on legal protection status, coverage under the Basin Plan, ecological importance, recreational/economic importance, and utility as indicators of specific beneficial uses (see Table 1-1 for preliminary list).
3. **Describe Habitat Relationships**: Describe relevant life history attributes, habitat requirements, potential limiting factors, and observed habitat associations of key evaluation species and communities, focusing in on sensitive life stages that occur during effluent-dominated flow months (because these life-stages would be most affected by discharge removal). Describe observed and/or published habitat relationships that define potential species/community responses to changes in flow, water quality, water temperature, and other variables potentially affected by proposed WWTP discharge removal.

4. **Conduct Flow Analysis**: Simulate potential effects of WWTP discharge removal on streamflow below the outfall by subtracting historical daily average WWTP discharge from historical daily average streamflow above the outfall. Describe predicted changes in timing, magnitude, frequency, and duration of flows, and how these changes would affect other key habitat variables, focusing on the effluent dominated months when discharge removal would result in little or no flow below the outfall (see Figures 1-1 to 1-3).

5. **Evaluate Potential Impacts:** Qualitatively evaluate potential effects of WWTP discharge removal on existing beneficial uses based on predicted changes in habitat conditions below the outfall and the expected responses of the key evaluation species and communities.

Table 1-1 below, outlines an example of the species and community parameter screening process. In addition, predicted daily flow changes and frequency distribution curve based on the upstream stream hydrology and the effluent data for the past eight years (2001-2008) are depicted in Figures 1-1a/b, and 1-2, respectively.

Note: Flow estimates upstream of the WWTF are from 2001-2008 and therefore do not reflect the potential future decrease in flow conditions when the Amador Water Agency canal is converted to a pipeline.

1.4 PRELIMINARY FLOW FINDINGS AND PROPOSED APPROACH

Based on our analysis of daily average flow rates (2001-2008) above the outfall (R1 Station), Jackson Creek has gone dry for periods greater than 30 days during three of the past eight years (Figure 1-1, Table 1-2). The key period when effluent dominates (consists of more than 50%) of the flow below the outfall is July to September in moderately dry to dry years (2001/2002, 2003, 2007 and 2008) (Figure 1-2). During these drier years, in the late summer/early autumn period the flow rate at R1 above the outfall was either zero or the flow rate was so low that removal of the effluent in combination with evapotranspiration and seepage may have caused it to go dry below the outfall. Therefore, the proposed analysis methods will focus on species requirements during late summer and early autumn.

In addition, to better understand the overall changes in the creek hydrograph under zero effluent conditions, the City proposes to utilize a frequency distribution curve to assess projected frequency of dry and low flow conditions. Based on flow data from 2001-2008, if the effluent were absent from the system, the stream would have been dry below the outfall 5% of the time (i.e. 164 days in 8 years, Figure 1-3, Table 1-2). This is the number of days R1 was dry during the period of record. R1, above the outfall went completely dry during 35, 62, 1, and 38 days during the years of 2001, 2002, 2003, and 2008, respectively.

Therefore, the proposed analysis methods will focus on species requirements during the expected stressor period with respect to flow, July to September, and will address the impacts of such changes is flow-rate frequencies (Tables 1-2) on key species and community indicators (Table 1-1) in a qualitative manner.

ecial tus ing?	Basin Plan Recreation Importance (Hunting, Fishing, Wildlife Viewing	Critical Life Stage and/or season (dates TBD)	Native	Suitable Beneficial Use Indicator						Clear Al Migrate o Low Perio
				Warm Freshwater Aquatic Habitat	Warm Water Fish Migration Habitat	Warm Water Fish Spawning Habitat	Cold Freshwater Aquatic Habitat	Cold Water Fish Migration Habitat	Wildlife Habitat	
	X		X	X	x	X				N
				X	x	X				N
	X						X	x		N
	X		X				x	x		N
X			X						X	N
X			X						X	N
									X	N
			X						X	YE
X	X		X						X	Mode
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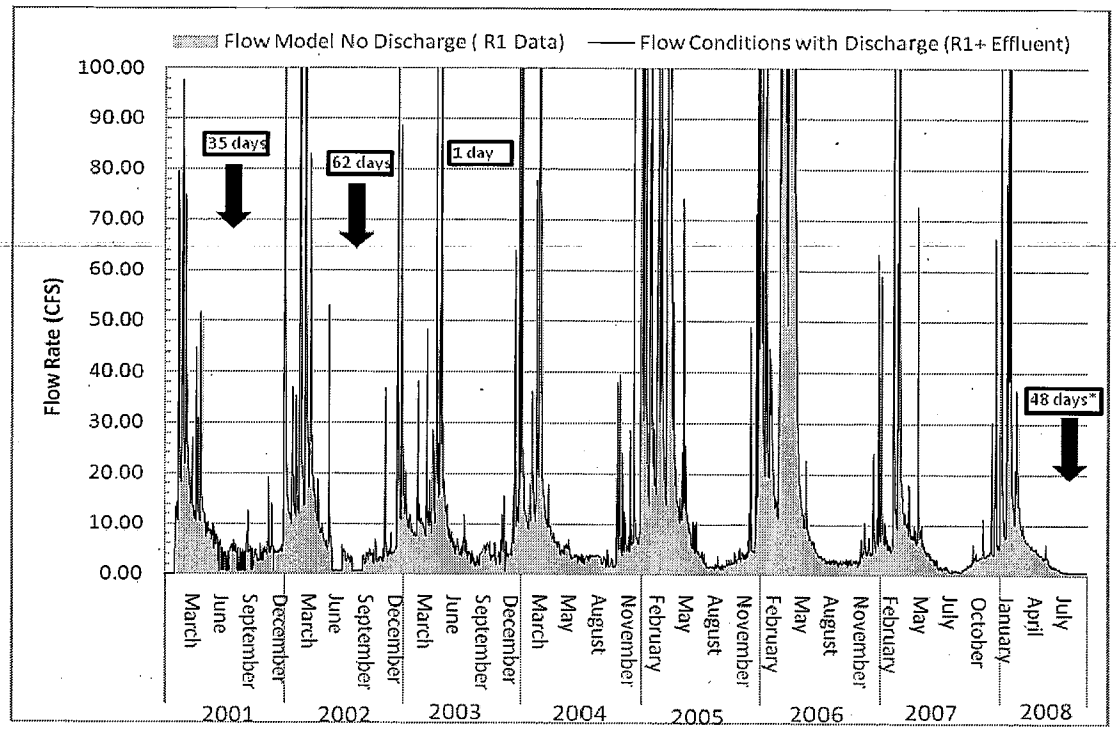

Figure 1-1
Flow Model Overview Based on 2001-2007 Hydrograph
(Black Arrows indicate periods and number of days when stream was actually dry above the outfall at R1.)

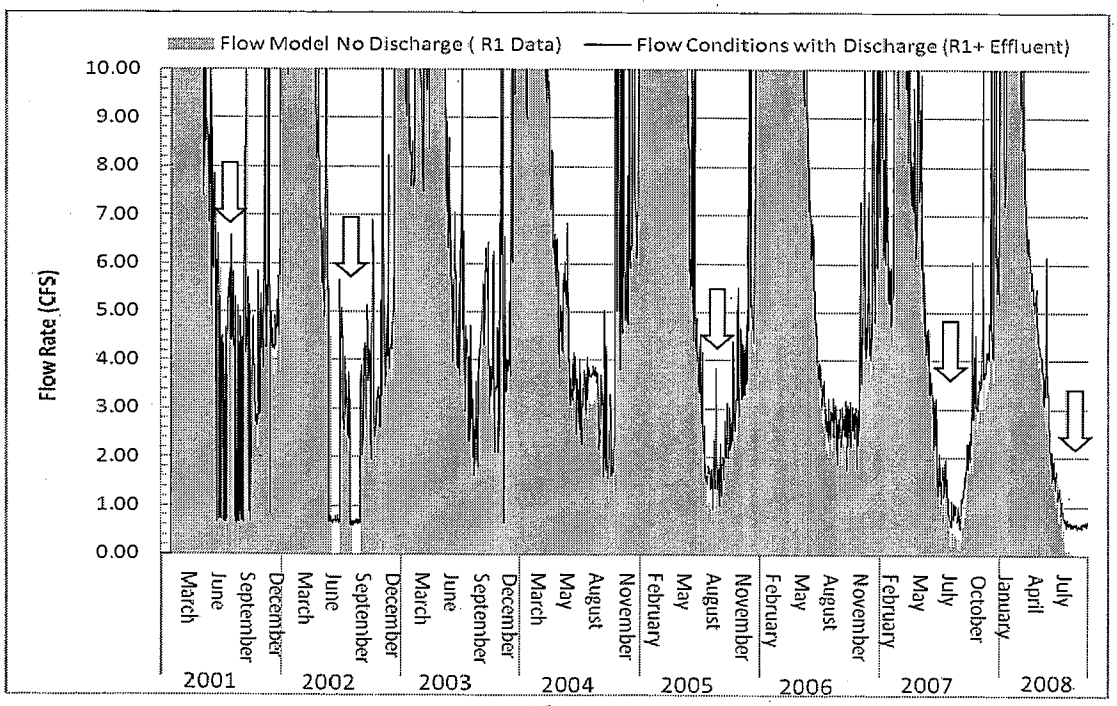

Figure 1-2
Focused (0-10 cfs) Flow Model Based on 2001-2008 Hydrograph
(White Arrows indicate times when stream had days of effluent dominance, greater than 50%, and could have gone dry under no effluent conditions, depending on natural water loss rates.)

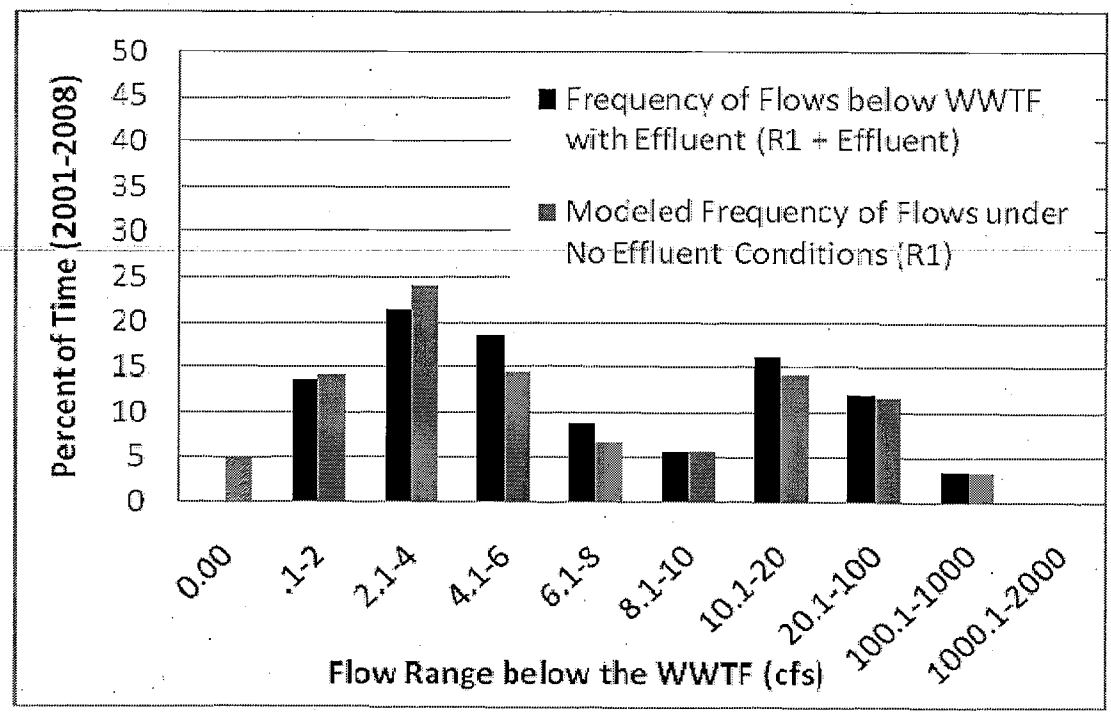

Figure 1-3
Frequency Distributions of Flow Ranges During the Past Eight Years (Black Bars) **and Estimated Flow Frequency Distribution Without Effluent** (Gray Bars)
Note: Refer to Table 1-2 for Raw Data.

Table 1-2
Flow Frequency Distribution
Actual and predicted number of days of each flow range in Jackson Creek (with and without effluent). This analysis is based on 2001-2008 flow data prior to the planned piping of the Amador Water Agency canal

Flow Range (cfs)	Number of Days (n = 2798)		Change in Number of Days at Each Flow Range
	True Flow Below Outfall (R1+ Effluent)	No Effluent Model (R1, Natural Conditions)	
0	0	146	146
.1-2	382	396	14
2.1-4	600	672	72
4.1-6	522	406	-116
6.1-8	245	190	-55
8.1-10	157	163	6
10.1-20	454	396	-58
20.1-100	338	332	-6
100.1-1000	99	97	-2
1000.1-2000	1	0	-1