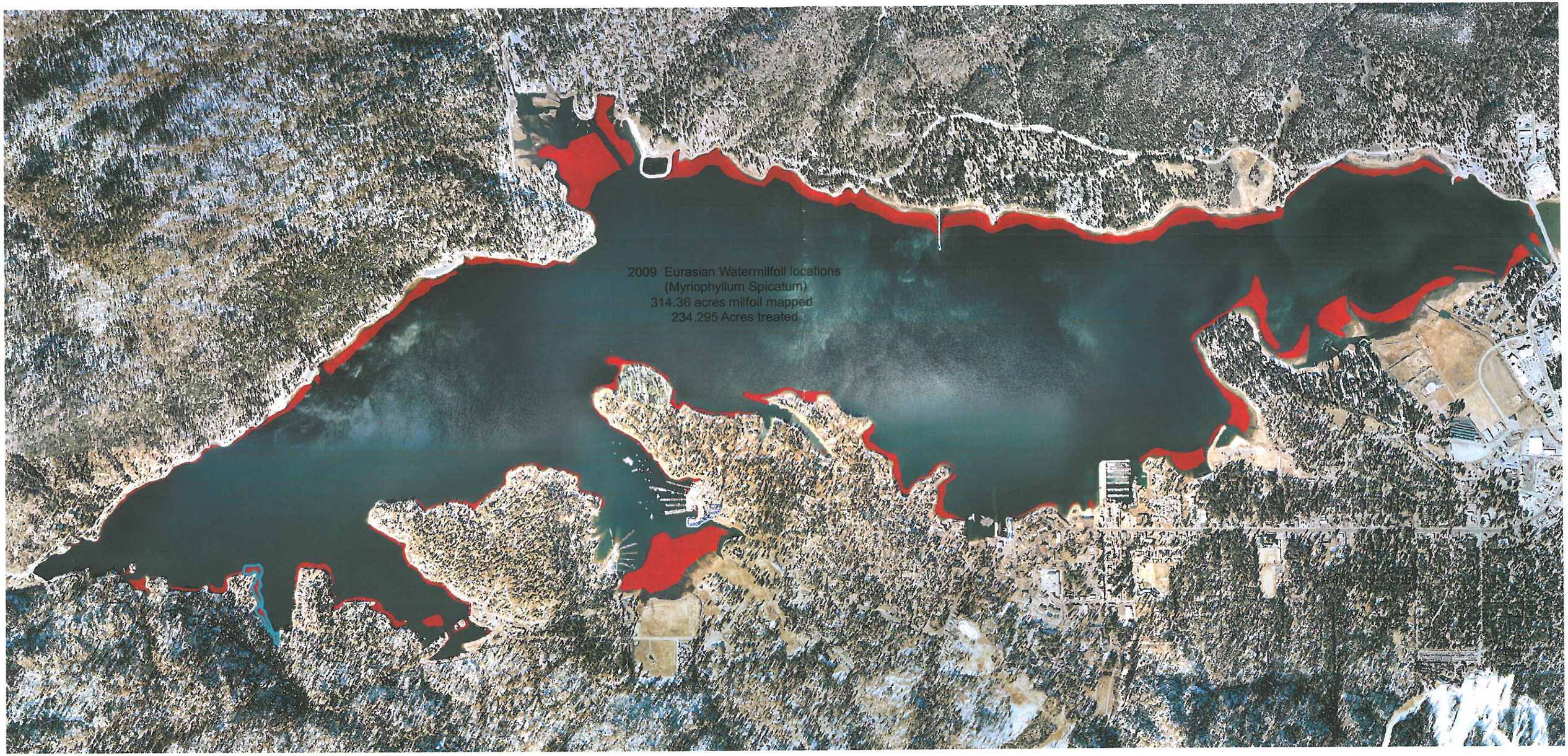
2009 Eurasian Watermilfoil locations
(Myriophyllum Spicatum)
314.36 acres milfoil mapped
234.295 Acres treated

Santa Ana Watershed Project Authority

SAWPA

June 15, 2010

Gerard Thibeault, Executive Director
Regional Water Quality Control Board
3737 Main St., Suite 500
Riverside, CA 92501

RE: Big Bear Lake Nutrient TMDL Task Deliverable
Task 6 – Submittal of Integrated Management Plan for the Dry Hydrological Conditions

Ron Sullivan
Commission
Chair

Celeste Cantú
General
Manager

Eastern
Municipal
Water
District

Inland
Empire
Utilities
Agency

Orange
County
Water
District

San
Bernardino
Valley
Municipal
Water
District

Western
Municipal
Water
District

Dear Mr. Thibeault:

The Big Bear Lake Nutrient TMDL Task Force (Task Force) is submitting the attached letter in response to the June 15, 2010 NPDES permit requirement for submittal of several documents required under the Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions (NPDES Permit Section V.D.4.h). To date, the Santa Ana Regional Water Quality Control Board (RWQCB) has received four documents that satisfy the requirements of Task 6D of the TMDL. These documents include: Nuisance and Noxious Aquatic Plant Management Plan, Model Update Plan, Sediment Nutrient Reduction Plan, and the Strategy for Reducing Wet Weather Inputs of Nutrients to Big Bear Lake.

The Task Force appreciates that there is no further comment from the RWQCB on the Sediment Nutrient Reduction Plan or the Strategy for Reducing Wet Weather Inputs of Nutrients to Big Bear Lake. However, as discussed at the May 18, 2010 Task Force meeting, it is clear that addressing the RWQCB's comments on the Aquatic Plant Management Plan and Model Update Plan will require more time beyond June 15, 2010. It was also decided that these four plans would be merged together into one Integrated Planning document (Plan) that would be submitted to the RWQCB at a later date. That effort is now underway and a draft is expected to be completed by mid-July 2010. Finally, as was also discussed at the meeting, it makes more sense to obtain the review and approval or conditional approval of Big Bear Municipal Water District (District) for the various activities proposed for the Lake in the Plan and potentially new commitments for the District that result from the Plan. To that end, the District has scheduled a workshop with its Board of Directors on June 24, 2010 followed by some formal action on the Plan at a later date in July or August.

Therefore, the Task Force respectfully recommends extending the submittal date of the Final Integrated Plan to August 24, 2010 and scheduling the RWQCB hearing on the Plan in the September or October time frame in order to allow sufficient time to accomplish these actions. We look forward to discussing the Integrated Plan and outcome of the Big Bear Municipal Water District Workshop during the July Task Force meeting.

Thank you for your consideration. If you have any questions or concerns regarding our proposed plan, please contact me at 951-354-4221.

Respectfully submitted,

for

Mark Norton P.E., LEED AP
Water Resources & Planning Manager

CC: Ms. Hope Smythe / Regional Water Quality Control Board
Ms. Heather Boyd / Regional Water Quality Control Board
Mr. Matt Yeager / Storm Water Program Manager, San Bernardino County Flood Control District

COMMENT AND RESPONSE SUMMARY

BIG BEAR LAKE - NUTRIENT TMDL ANNUAL REPORT

Section	Page	Comment	Response
1.1 - TMDL Monitoring and Reporting Requirement	3	There are no interim phosphorus allocations and no interim phosphorus and chlorophyll *a* numeric targets.	References to "interim and/or final" will not be included in future Annual Reports.
		Would like to see some mention about the TMDL, WLA and Las.	A new section and reference table listing the TMDL, WLA and LAs (based on Table 5-9a-3 of R8-2006-0023) will be included in future reports.
		A table showing the TMDL, WLA and LAs and under what conditions those loads have to be calculated (dry hydrological conditions).	
		A brief paragraph stating that 2009 did not fall under those conditions with the data to back that statement up (preferably presented in table) so that we know that you did look at the data and that this information was not overlooked.	Dry hydrologic conditions were not present in 2009 (in 2009, the precipitation at Bear Valley Dam provided by BBMWD was 30.7" (limit is 23")). A comparable evaluation and brief statement will be included in future reports.
1.3 – Numeric Targets	4	Please include Table 5-9a-c of the TMDL with all the numeric targets, including the vegetation metrics.	Reference Table 5-9a-c of R8-2006-0023 – TMDL Numeric Targets will be inserted into Section 1.3 of future rreports.
		There should be some mention that the vegetation numeric targets were not calculated in this annual report because the vegetation plan that includes the procedure for calculating such targets has not been finalized.	This comment will be included in future reports until such a procedure is finalized.
Section 2.0 - Big Bear Lake: In-Lake Nutrient Monitoring Program	5	Include the Resolution No. of the finalized Monitoring Plan (MP) (2008-070) and the date of the approved MP (Nov. 2007)	The Resolution No. and date of the approved MP will be included in future reports.
		Separate the parameters into field and laboratory	In future reports, these parameters will be presented separately.
		Consistency between what is presented in MP versus TMDL versus data actually collected – e.g., alkalinity, hardness collected as both photic zone composite and bottom discrete – MP states only photic zone composite; VSS collected but not in MP; MP states TDS collected as both photic zone composite and bottom discrete, but not included in data on CD.	This comment pertains to sampling that is conducted by BBMWD. Brown and Caldwell has been tasked to summarize and discuss the in-lake data, not to collect it.
	6	Sampling schedule – consistency between what is presented in MP versus TMDL versus data actually collected. – Approved MP does not state TOC and DOC will be monitored quarterly (no data were submitted that shows these constituents were monitored at all in 2009) – Approved MP states one event per Month for March, April and November and 2 events per month for May-Oct (actual sample dates show no samples for March and April; 2 event for May-Sept; 2 events for No. and one event for	This comment pertains to sampling that is conducted by BBMWD. Brown and Caldwell has been tasked to summarize and discuss the in-lake data, not to collect data.

Section	Page	Comment	Response
		Oct.)	
		Include the dates of each sampling event in the sampling schedule.	The dates of each sampling event will be included in future reports.
Section 2.1 - In-Lake Annual Water Quality Summary	7	Separate all data in to 2 tables – field versus laboratory.	These data will be presenetd separately in future reports.
		Include standard deviation with all annual means.	Standard deviations will be calculated and provided in future reports.
		Include the sample count for all means.	Sample count will be provided in future reports.
		For range of values, instead of presenting ND – include the TRL (e.g., <0.1 – 30).	In future reports, the range will be presented using the TRL as the lowest value.
	8	Make sure the annual means reflect significant figures reported, e.g., chla is shown with 2 decimal points, but reported data shown with one; TP shown with 2 decimal points, but reported data shows none.	Data in future reports will be submitted using consistent significant figures.
		For numeric targets (chla and total P) would like to see the 95% CI so we know how close the reported lakewide average is to the actual numeric target.	Brown and Caldwell will request these data from BBMWD for inclusion in future reports. It is assumed that the statistics necessary to establish a 95% Confidence Interval will be prepared by BBMWD and submitted to Brown and Caldwell to include as attachments to the Annual Report.
		Include a brief note about how NDs were included in the means – was ½ the DL or TRL used to calculate the averages.	Future reports will include a note that NDs were accounted for by using ½ the TRL to calculate averages.
	7-8	Not all data that were collected or supposed to be collected are summarized. – DOC, hardness, TOC and TDS are not summarized. – DOC, TOC and TDS not included on the CD.	These data were not provided to Brown and Caldwell for use in preparing the 2009 Annual Report. Brown and Caldwell will request these data from BBMWD for inclusion in future reports. It is assumed that vertical profiles will be prepared by BBMWD or others and submitted to Brown and Caldwell to include as attachments to the Annual Report.
		Vertical profile measurements and secchi depth are not include on the CD and are not summarized.	
		The calibration records for the YSI probe should be submitted with the annual data.	Calibration forms were not provided to Brown and Caldwell for use in preparaing the 2009 Annual Report. Brown and Caldwell will request these data from BBMWD for inclusion in future reports. It is assumed that these forms will be included as attachments to future Annual Reports.
		For DO and pH vertical profile measurements, want to see the data graphed, so we know when the lake is not meeting the water quality objetuive for the COLD beneficial use – would have 4 graphs showing each station with all dates for DO and 4 grpahs for pH.	These data were not provided to Brown and Caldwell for use in preparing the 2009 Annual Report. Brown and Caldwell will request these data from BBMWD for inclusion in future reports. It is assumed that vertical profiles and graphs (DO, pH and Secchi depth) will be prepared by BBMWD or others and submitted to Brown and Caldwell to include as attachments to the Annual Report.
		Also graph the secchi disk data – one graph showing all stations and dates.	

Section	Page	Comment	Response
Section 3.0 - Big Bear Lake Watershed Nutrient Monitoring Program	9	Include the Resolution No. of the finalized Monitoring Plan (MP) (2009-043).	The Resolution No. of the final MP will be included in future reports.
		Separate the parameters into field and laboratory.	In future reports, these parameters will be presented separately.
		Consistency between what is presented in MP versus data actually collected MP states nitrate+ nitrite - the data collected were nitrate as N and nitrite as N.	The original laboratory that provided analyses for this project (E.S. Babcock) was only able to provide results as nitrate N and nitrite N. Beginning in December 2009, samples were analyzed by GEI Consultants in Denver, Co and reported as nitrate+nitrite N. Therefore, future reports will report dta as nitrate+nitrite N as presented in the MP. Chlorophyl a is not being sampled in the tributaries, as was agreed by the Task Force in summer 2009. The actual frequency of the sampling was conducted according to the schedule in the approved MP; however, in future Annual Reports, Table 3-2 will be modified to be consistent with the format of Table 3-3 in the MP.
	11	Sampling schedule – consistency between what is presented in MP versus TMDL versus data actually collected. — Approved MP sampling frequency is not what is presented in Table 3-2. — Approved MP does not include chlorophyll a.	
		Include the dates of each sampling event in the sampling schedule.	The dates of each sampling event will be included in future reports.
		Include information about why a winter storm was not collected; nor a summer storm.	Future reports will include justification for why storm event data were not collected.
		Include updated information about which constitu-ents are sent o GEI under what conditions.	Future reports will include a paragraph explaining which analyses GEI is conducting.
		Include updated information about which parameters are collected over the hydrograph (see notes form January 6, 2010 meeting).	Future reports will include a discussion of which storm event parameters are collected and analyzed as a composite versus discrete grab samples.
Section 3.1 - Big Bear Lake Watershed Annual Water Quality Summary	12-14	Include standard deviation with all annual means.	Standard deviations will be calculated and provided in future reports.
		Include the sample count for all means.	Sample count will be provided in future reports.
		For range of values, instead of presenting ND – include the TRL (e.g., <0.1 – 30).	In future reports, the range will be presented using the TRL as the lowest value.
		Make sure the annual means reflect the actual significant figures reported, e.g., temperature is reported to one decimal point in field notes, but two decimal points in some summarized data; other summarized data show similar issues.	Data in future reports will be submitted using consistent significant figures.
		Consistency of reported data among sampling dates – some pH, DO and temperature data reported with two decimal points, some with one - if using the same instrument shouldn't these all be reported the same way?	Data in future reports will be submitted using consistent formats.
		Include a brief note about how NDs were included in the means – was ½ the DL or TRL used to calculate the averages.	Future reports will include a note that NDs were accounted for by using ½ the TRL to calculate averages.
		Is the Horiba instrument being used to obtain all field measurements because there is also notation of a Hach meter on the field notes (not included in the MP).	In preparing future reports, Brown and Caldwell will verify the actual instruments used for obtaining field measurements.

Section	Page	Comment	Response
		The pre and post calibration notes only show the pH parameters and none of the other parameters being collected.	Future reposrts will include calibration notes for all field constituents.
Section 4.0 - Nuisance Aquatic Plant Eradication Program	15	The two maps submitted have no title and no legends and are unclear in what they are attempting to depict.	Future reports will include executable files of the maps, as it is not possible to show all of the information effectively in a pdf file.
		The report states that there are maps and charts included as Appendix C – only see maps and no charts.	In preparing future reports, Brown and Caldwell will verify whether there are charts in addition to maps.
		Not clear how these maps show that eradication of nuisance plants is conducted in accordance with Table 5-9a-c of the TMDL.	Future reports will include executable files of the maps, as it is not possible to show all of the information effectively in a pdf file.
		This section should describe what is being done to meet the vegetation numeric targets. In this instance, there should be some mention that the vegetation numeric targets were not calculated in this annual report because the vegetation plan that includes the procedure for calculating such targets has not been finalized.	Future reports will include a discussion of efforts being conducted to achieve the vegetation numeric targets and will state that no procedure to calculate the targets has yet been developed. This comment will be included in future reports until such a procedure is finalized.

Big Bear Lake Nutrient TMDL Implementation Plan/Schedule Due Dates

TMDL Compliance

Compliance with "dry hydrological conditions" to be achieved as soon as possible, but no later than 2015					
Compliance with "wet and/or average hydrological conditions" to be achieved as soon as possible, but no later than 2020					
Task	Description	Responsible Party	Compliance Date-As soon As Possible but No Later Than	Delivery Date	Status
Phase 1 - Regional Board TMDL Deliverables					
Task 1	Establish New Waste Discharge Requirements for Nutrient Sources	Regional Board[1]	February 29, 2008	Sept. 2009	in review
	Waste Discharge Requirements (WDRs) or Conditional Waiver of WDRs to the US Forest Service				
Task 2	Establish New Waste Discharge Requirements for Lake Restoration Activities	Regional Board [+]	February 28, 2009	Oct. 2009	in review
	NPDES Permit to the US Forest Service, the State of California, Department of Transportation (Caltrans), the County of San Bernardino, San Bernardino County Flood Control District, the City of Big Bear Lake, and Big Bear Mountain Resorts				
Task 3	Revise Existing Waste Discharge Requirements	Regional Board[2]	February 29, 2008	Dec. 2009	in review
	3.1 Waste Discharge Requirements for the San Bernardino County Flood Control and Transportation District, the County of San Bernardino and the Incorporated Cities of San Bernardino County within the Santa Ana Region				
	3.2 State of California, Department of Transportation (Caltrans) Stormwater Permit				
Task 4	Nutrient Water Quality Monitoring Program		Plan/schedule due November 30, 2007 Annual reports due February 15		
	4.1 Watershed-wide Nutrient Monitoring Plan(s)	Task Force *		Jul-10	Final
	4.2 Big Bear Lake Nutrient Monitoring Plan(s)	Big Bear MWD			
	4.3 Annual Report			Feb-10	Annual Report
Task 5	Atmospheric Deposition Determination	Regional Board [++]	Plan/schedule due August 31, 2008	July 30, 2008	Task 1 in review
Task 6	Big Bear Lake – Lake Management Plan, including:		Plan/schedule due August 31, 2008 Annual reports due February 15		
	6A. Big Bear Lake and Watershed Model Updates	Task Force *		Apr-10	Draft Submittal
	6B. Big Bear Lake In-Lake Sediment Nutrient Reduction Plan for Dry Weather Conditions	Task Force *		Mar-10	Draft Submittal
	6C. Big Bear Lake Aquatic Plant Management Plan	Big Bear MWD		Feb-10	Draft Submittal
	6D. Annual Report			Feb-10	Annual Report
Phase 2 - Regional Board TMDL Deliverables					
Task 7	Review/Revision of Big Bear Lake Water Quality Standards	Regional Board	December 31, 2015		
	7.1 Review/Revise Nutrient Water Quality Objectives				No work
	7.2 Development of biocriteria				No work
	7.3 Development of natural background definition				No work
Task 8	Review Big Bear Lake Tributary Data	Regional Board[3]	December 31, 2008	Jly. 2009	In review
Task 9	Develop TMDLs, WLAs and LAs for wet and/or average hydrological conditions	Regional Board [+++]	December 31, 2012		No work
Task 10	Review of TMDL/WLAs/Las	Regional Board[4]	Once every 3 years	2010	No work

[1] Regional Board staff need to review status of state agreements with USFS to determine direction wrt to WDRs or other regulatory action -expect decision Sept. 2009

[+] The Regional Board, pursuant to the submittal of Task 6C, the Aquatic Plant Management Plan and Schedule

[2] Per communication with the Stormwater section, anticipate 1st workshop in July and adoption in August or October 2009 for MS4 permit; Existing CalTrans permit is up for renewal - schedule dependent on State Board expect end of 2009

* Task Force includes the US Forest Service, the State of California, Departmrnt of Transportation (Caltrans), the County of San Bernardino, San Bernardino County Flood Control District, the City of Big Bear Lake and Big Bear Mountaion Resorts

[++] Regional Board, in coordination with local stakeholders, the South Coast Air Quality Management District and the California Air Resources B45; Plan submitted July 30, 2008 at TMDL meeting

[3] Regional Board staff received beneficial use data April 2009; will meet next submittal of data for 305(b) report due in 2010

[+++] The Regional Board, pursuant to the collection of additional water quality data and information to meet monitoring program requirements (Tasks 4 and 5) and complete model updates (Task 6A)

[4] Regional Board review dependent on submittal of sufficient data and model updates

Big Bear Lake Dry Hydrologic Conditions Nutrient TMDL Atmospheric Deposition Determination Plan/Schedule					
Task #	Task Description	Due Date	Delivery Date	Delivery Date	Status
1	Data/Literature Review	11/30/08	Draft report submitted to management -12/17/2008		in review
2	Agency Coordination	Ongoing			Letters sent to Air Agencies 4/2009
3	Source Identification	01/31/10			
4	Source Reduction Plan	04/30/10			
5	Final Atmospheric Deposition Implementation Plan	01/31/11			

Lake Management Plan to Achieve Compliance with the Nutrient TMDL for Dry Weather Conditions in Big Bear Lake TMDL Task Force* Implementation Schedule					
Task #	Task Description	Strategy	Due Date	Delivery Date	Status
1	Review and Update Public Education Program	Prevention	2009		
2	Perform Maintenance on All Retention Basins	Prevention	2009		
3	Seek General Permit for Low Level Maintenance Dredging	Mitigation	2009		
4	Summarize and Report Lake Stabilization Activities	Offset	2009		
5	Update 3D Beneficial Use Map and Related Database	Compliance	2009		
6	Develop Formal Weed Control Plan	Remediation	2010		
7	Develop Formal Aeration Operation & Expansion Plan	Remediation	2010		
8	Develop Formal Fishery Management Plan	Offset	2010		
9	Revise and Update TMDL Models	Regulatory	2010		
10	Perform Special Studies to Estimate Natural Background Loads	Regulatory	2010		
11	Regional Board's TMDL Review for Big Bear Lake		2010		
11	Develop Nutrient Load Accounting System	Regulatory	2011		
12	Interim Compliance Deadline for Dry Weather Conditions	Regulatory	2015		

Summary: Big Bear TMDL Task Force Budget

FINAL DRAFT Budget FY 2010-11

6/28/2010

Stakeholder Funding Allocation

	Allocation	Received	
California Department of Transportation	$ 15,265	$ -	
San Bernardino County Flood Control District *	$ 210,000	$ -	minus credit for FY 2008-09 Monitoring contract for B&C
Big Bear Mountain Resorts	$ 19,500	$ -	
Total Funding Required	**$ 244,765**		
FY 2009-10 Carry-over	**$ 145,676**		
Total Task Force Funds	**$ 390,441**		

* Share includes contributions from San Bernardino County Flood Control District, as well as, the County of San Bernardino, and the City of Big Bear Lake .

	Task Description	Total Budget	Task Force Budget	Stakeholder Funded
	Task Force Funded Tasks			
1	Task Force Administration and Coordination (SAWPA)	$ 40,000	$ 40,000	
2	Consultant Support at Quarterly Task Force Meetings (Risk Sciences)	$ 25,000	$ 25,000	
3	Watershed-wide Nutrient Monitoring Program (Brown & Caldwell)	$ 145,300	$ 145,300	
4	Integration of Management Plan (Brown & Caldwell)	$ 8,000	$ 8,000	
5	BMP Implementation Strategy (Brown & Caldwell)	$ 60,000	$ 60,000	
6	Model Update (Consultant)	$ 60,000	$ 60,000	
7	Annual Monitoring Report (Brown & Caldwell)	$ 27,000	$ 27,000	
8	Grant Preparation: Big Bear Lake Hypolimnetic Oxygenation System (OPTIONAL)	$ 22,000	$ 22,000	
	Stakeholder Funded Tasks			
9	In-Lake Nutrient Monitoring Program (Funded by Big Bear Municipal Water District)	$ 52,000		$ 52,000
10	Lake aeration for fisheries improvement (electricity) (Funded by Big Bear Municipal Water District)	$ 11,000		$ 11,000
11	Aquatic plant monitoring, both reconnaissance and littoral circumventing and transecting (Funded by Big Bear Municipal Water	$ 25,000		$ 25,000
12	Invasive plant treatment (Funded by Big Bear Municipal Water District)	$ 125,000		$ 125,000
13	Updating beneficial use map (Funded by Big Bear Municipal Water District)	$ 3,500		$ 3,500
14	Watershed Sampling (Labor Funded by Big Bear Mountain Resorts)	TBD		
15	Watershed Sampling at Grout Creek (Labor Funded by USFS)	TBD		
16	Natural Background Analysis (Funded by USFS)	(Tentative)		
	Subtotal	$ 603,800	$ 387,300	$ 216,500
	TMDL Implementation Budget	**$ 603,800**	**$ 387,300**	**$ 216,500**

Summary: Big Bear TMDL Task Force Budget

6/28/2010

Approved Budget FY 2007-08

Stakeholder Funding Allocation

	Allocation	Received
California Department of Transportation	$ 15,861.00	$ -
San Bernardino County Flood Control District *	$ 47,582.00	$ 47,582.00
Big Bear Mountain Resorts	$ 15,861.00	$ 15,861.00
Total Funding Required	**$ 79,304.00**	**$ 63,443.00**

* Share includes contributions from San Bernardino County Flood Control District, as well as, the County of San Bernardino, and the City of Big Bear Lake

Task Description

		Total Budget	Task Force Budget	Stakeholder Funded	Invoiced
1	Watershed-wide Nutrient Monitoring Plan (TMDL Task #4.1 due 11/30/2007; Risk Sciences)	$ 25,000.00	$ 25,000.00		$ 37,955.03
8	Consultant Support at Task Force Meetings (Risk Sciences)	$ 15,000.00	$ 15,000.00		
2	BBMWD funded: Big Bear Lake Nutrient Monitoring Plan (TMDL Task #4.2 due 11/30/2007; Erika Saad)	$ 15,000.00		$ 15,000.00	
3	SBCFCD and City of Big Bear Lake funded: Atmospheric Deposition Determination lab analysis (TMDL Task #5 due 8/31/2008; USFS labor $22,960;)	$ 22,960.00		$ 22,960.00	
	Atmospheric Deposition Analysis (Funded by U.S. Forest Service)		$ 3,960.00		$ 11,696.48
4	BBMWD funded: Big Bear Lake - Lake Management Plan (TMDL Task #6 due 8/31/2008; Risk Sciences)	$ 100,000.00		$ 100,000.00	
9	Task Force Administration and Coordination (SAWPA)	$ 25,000.00	$ 25,000.00		$ 26,671.27
10	Contingency	$ 10,344.00	$ 10,344.00		
	TOTAL	**$ 213,304.00**	**$ 79,304.00**	**$ 137,960.00**	**$ 76,322.78**

NOTE: Budget for 2007-08 includes only costs associated with general Task Force administration and preparation of mandatory monitoring plans. The current budget does not include cost of implementing the monitoring program. Actual monitoring is expected to begin next fiscal year (July, 2008).

FY 2007-08 Task Force Budget Summary

	Projection
Stakeholder Contributions	**$ 63,443.00**
Task Force Costs	**$ 76,322.78**
Task Force Carry Over **	**$ (12,879.78)**

Summary: Big Bear TMDL Task Force Budget

Approved Budget FY 2008-09

6/28/2010

Stakeholder Funding Allocation

	Allocation	Received
California Department of Transportation	$ 31,680.00	$ 31,680.00
California Department of Transportation (FY2007-08)	$ 15,861.00	$ 15,861.00
San Bernardino County Flood Control District *	$ 265,120.00	$ 265,120.00
Big Bear Mountain Resorts	$ 20,000.00	$ 20,000.00
Total Funding Required	**$ 332,661.00**	**$ 332,661.00**

* Share includes contributions from San Bernardino County Flood Control District, as well as, the County of San Bernardino, and the City of Big Bear Lake

Task Description

		Total Budget	Task Force Budget	Projected Stakeholder Funded	Projected Cost To Task Force
1	Task Force Administration and Coordination (SAWPA)	$ 40,000.00	$ 40,000.00		$ 37,000.00
2	Database Management and RWQCB Annual Reports (SAWPA)	$ 18,000.00	$ 18,000.00		$ 12,440.33
3	Consultant Support at Quarterly Task Force Meetings (Risk Sciences) **	$ 30,000.00			$ 20,219.02
4	Watershed-wide Nutrient Monitoring Program (Consultant)	$ 200,000.00	$ 200,000.00		$ 47,902.90
	Additional Costs for Preparation of Watershed Monitor Plan and QAPP **				included in above
	Watershed Sampling & Delivery Labor (Funded by Big Bear Mountain Resorts $100,000)	$ 100,000.00		$ 100,000.00	
6	In-Lake Nutrient Monitoring Program (Funded by Big Bear Municipal Water District)	$ 50,000.00		$ 50,000.00	
7	Atmospheric Deposition Monitoring including collection, sampling, delivery, & analysis (Funded by USFS) **				$ 1,715.08
	Natural Background Analysis (Tentative) (Funded by USFS)				
	FY 2007-08 Budget Shortfall **				$ 12,879.78
	Subtotal	$ 438,000.00	$ 258,000.00	$ 150,000.00	$ 132,157.11
	Contingency (10%)	$ 25,800.00	$ 25,800.00		
	TMDL Implementation Budget	**$ 463,800.00**	**$ 283,800.00**	**$ 150,000.00**	**$ 132,157.11**

FY 2008-09 Projection

	Actual (end of FY)
Stakeholder Contributions	**$ 332,661**
Task Force Projected Costs	**$ 132,157**
Task Force Carry Over	**$ 200,504**

** highlighted cells identify items to be reimbursed to BBMWD for expenses incurred to support Task Force. These include $12,879.78 for FY 2007-08 to address the deferred payment by Cal Trans , and Task Force expenses for FY 2008-09 including $20,219.02 for consulting support by Risk Sciences and $ 1,715.08 for delivery charges for Atmospheric Deposition Monitoring

Summary: Big Bear TMDL Task Force Budget

6/28/2010

Approved Budget FY 2009-10

Stakeholder Funding Allocation

	Allocation	Received
California Department of Transportation	$ 19,000	$ 19,000
San Bernardino County Flood Control District *	$ 160,000	$ 147,338
Big Bear Mountain Resorts	$ 11,275	$ 11,275
Total Funding Required	**$ 190,275**	**$ 177,613**
FY 2008-09 Carry-over	**$ 200,504**	**$ 200,504**
Total Task Force Funds	**$ 390,779**	**$ 378,117**

* Share includes contributions from San Bernardino County Flood Control District, as well as, the County of San Bernardino, and the City of Big Bear Lake

	Task Description	Total Budget	Task Force Budget	Stakeholder Funded	Projected Cost To Task Force
	Task Force Funded Tasks				
1	Task Force Administration and Coordination (SAWPA)	$ 40,000	$ 40,000		$ 40,000
2	Database Management and RWQCB Annual Reports (SAWPA)	$ 18,000	$ 18,000		$ 10,000
3	Consultant Support at Quarterly Task Force Meetings (Risk Sciences - includes a 20% reduction)	$ 24,000	$ 24,000		$ 5,000
4	Watershed-wide Nutrient Monitoring Program (Consultant)	$ 232,200	$ 232,200		$ 142,200
5	Submit documentation to support revision of beneficial use designations and related water quality objectives for pathogen indicator bacteria in Knickerbocker Creek (Risk Sciences)	$ 19,000	$ 19,000		
6	FY 2008-09 Watershed-wide Nutrient Monitoring (B&C Through SBCFCD)				$ 35,241
	Stakeholder Funded Tasks				
7	In-Lake Nutrient Monitoring Program (Funded by Big Bear Municipal Water District)	$ 50,000		$ 50,000	
8	Watershed Sampling (Labor Funded by Big Bear Mountain Resorts)	TBD			
9	Watershed Sampling at Grout Creek (Labor Funded by USFS)	TBD			
10	Natural Background Analysis (Funded by USFS)	(Tentative)			
	Subtotal	$ 383,200	$ 333,200	$ 50,000	$ 232,441
	Contingency	$ 19,685	$ 19,685		
	TMDL Implementation Budget	**$ 402,885**	**$ 352,885**	**$ 50,000**	**$ 232,441**

FY 2009-10 Projection

Stakeholder Contributions including Carry-over	**$ 378,117**
Task Force Projected Costs	**$ 232,441**
Task Force Carry Over	**$ 145,676**

Big Bear Lake Nutrient TMDL Compliance Program Watershed-Wide Water Quality Monitoring and Support, FY 2010-2011 Scope of Work

Brown and Caldwell

Brown and Caldwell will coordinate the Big Bear Lake Nutrient TMDL Watershed-Wide Storm Monitoring Program during Fiscal Year 2010-11 in accordance with the Monitoring Plan prepared for this project. Water quality samples will be collected at the following locations in the watershed:

- Rathbun Creek (@ Sandlewood Drive)
- Rathbun Creek (Below Zoo)
- Grout Creek (@ Highway 38)
- West Summit Creek (@ Swan Drive)
- Knickerbocker Creek (@ Highway 18)
- Boulder Bay Creek (@ Highway 18)

The TMDL sampling methodology described in the Monitoring Plan requires the collection and analysis of monthly baseflow samples, snowmelt samples, and storm water samples, as shown in the following table:

Type of Analysis	Sampling Period	Sampling Frequency
Baseline Quality (Dry Weather)	Jan. 1st – Dec. 31st	Once per month when representative flow is present*
Snowmelt Quality	Feb. 1st – May 31st	Four samples, once per month, between February and May when representative flow is present*
Winter Storms	Oct. 1st – Mar. 31st	One storm event where est. rainfall >0.5"/24 hrs
Summer Storms	Apr. 1st – Sept. 1st	One storm event where est. rainfall >0.5"/24 hrs

* Baseline and snowmelt samples shall be collected by San Bernardino County Flood Control District staff, with Brown and Caldwell as backup for one month in the event the District cannot perform the sampling.

Approach/Work Plan

Brown and Caldwell's approach to the Watershed-wide Water Quality Monitoring Program is to provide the Big Bear Lake Nutrient TMDL Task Force with the necessary expertise and experience to successfully complete all of the required monitoring and reporting proposed for fiscal year 2010-11. During summer 2009, Brown and Caldwell performed two rounds of training in proper sampling methods to staff from the San Bernardino County Flood Control District, City of Big Bear Lake, Big Bear Mountain Resorts, U.S. Forest Service, and Caltrans. Subsequently, beginning in September, staff from the San Bernardino County Flood Control District began conducting the monthly baseline and snowmelt sampling.

Samples have been collected as manual grabs from the six tributaries flowing into Big Bear Lake listed in the table above. Originally, samples were to be collected from Bear Creek, immediately downstream of the dam; however, this site was eliminated due to major Caltrans bridge construction at the dam which made access to the sampling site difficult. This site may be reconsidered fro sampling once bridge construction activities are completed in 2012, but sampling will not be conducted at the Berar Creek outlet during fiscal year 2010-11.

Laboratory Analyses

As with the sampling locations, the Santa Ana Regional Water Quality Control Board mandated in the TMDL that certain water quality parameters be analyzed and reported. The specific field and laboratory parameters to be analyzed are presented in the following table, along with information regarding the methods, units, method detection limit, and target reporting limit. All data will be collected and analyzed in compliance with the Surface Water Ambient Monitoring Program (SWAMP). As was agreed by the Task Force and Regional Board during fiscal year 20009-10, a subset of the samples collected during the baseline and snowmelt samples will be analyzed by GEI Consultants of Denver, Colorado in order to achieve lower detection limits specified by the Regional Board. The remainder of the constituents will be analyzed by E.S. Babcock Laboratories in Riverside, California. For logistical reasons, all storm event samples will be analyzed by Babcock only.

In order to meet laboratory holding times for certain analyses (i.e., within 48 hours of sample collection for several analyses), we propose to deliver sample bottles to the laboratory at least once per 24-hour period of monitoring during storm events. Sample bottles will be properly labeled and stored in coolers on ice for delivery to Babcock Laboratories. All samples will be handled following strict Chain-of-Custody procedures.

We assume a standard laboratory turnaround time (7 days) to receive analytical results for the storm event. Brown and Caldwell will review and summarize the results using a tabular format.

Analytical Methods for Water Quality Parameters (Field and Laboratory)

Parameter	Laboratory	Units	Analytical Method	MDLs	Target Reporting Limits
Temperature	Field Sampling Staff	°C	Thermometer (-5 to 50oC)	NA	NA
Dissolved Oxygen	Field Sampling Staff	mg/L	Field – Horiba Meter	NA	0.2 mg/L
pH	Field Sampling Staff	s.u.	Field – Horiba Meter	NA	NA
Conductivity	Field Sampling Staff	mS/cm	Field – Horiba Meter	NA	2.0 mg/L
Turbidity	Field Sampling Staff	NTU	Field – Horiba Meter	NA	5.0 mg/L
Biochemical Oxygen Demand (BOD)	E.S. Babcock	mg/L	SM 5210B	1.0 mg/L	5.0 mg/L
Chemical Oxygen Demand (COD)	E. S. Babcock	mg/L	SM 5220D	1.0 mg/L	5.0 mg/L
Total Organic Carbon (TOC)	E.S. Babcock	mg/L	SM 5310B	0.1 mg/L	0.6 mg/L
Dissolved Organic Carbon (DOC)	E.S. Babcock	mg/L	SM 5210B	0.1 mg/L	0.6 mg/L
Total Nitrogen	GEI Consultants	µg/L	4500-N B	2 µg/L	2 µg/L
Total Dissolved Nitrogen	GEI Consultants	µg/L	4500-N B	2 µg/L	2 µg/L
Ammonia Nitrogen	GEI Consultants	µg/L	SM 4500-NH3, 10-107-06-3-D	3 µg/L	3 µg/L
Nitrate/Nitrite Nitrogen	GEI Consultants	µg/L	SM 4500-NO2B 10-107-04-1-B	2 µg/L	2 µg/L
Total Phosphorus	GEI Consultants	µg/L	SM 4500 PBE 10-115-01-1-U	2 µg/L	2 µg/L
Total Dissolved Phosphorus	GEI Consultants	µg/L	SM 4500 PBE 10-115-01-1-U	2 µg/L	2 µg/L
Ortho-Phosphate	GEI Consultants	µg/L	SM 4500 PE 10-115-01-1-T	2 µg/L	2 µg/L
Total Suspended Solids	E.S. Babcock	mg/L	SM 2540 D	0.5 mg/L	0.5 mg/L
Volatile Suspended Solids	E.S. Babcock	mg/L	SM 2540 E	1.0 mg/L	1.0 mg/L
Alkalinity as CaCO3	E.S. Babcock	mg/L	SM 2320 B	0.2 mg/L	1.0 mg/L
Hardness as CaCO3	E.S. Babcock	mg/L	SM 3120 B HACH 8266	0.2 mg/L	1.0 mg/L

Attend Selected Big Bear Lake Nutrient TMDL Task Force Meetings

Brown and Caldwell staff will attend up to 6 meetings of the Task Force to coordinate with the stakeholder and Regional Board, provide updates on monitoring activities, and present summaries of monitoring results. When appropriate, we will develop a PowerPoint presentation that presents the results in a clear format that is easy to understand.

Draft and Final Annual Water Quality Monitoring Report

Brown and Caldwell will prepare a draft and final Annual Water Quality Monitoring Report (due to the Regional Board by February 15, 2011). We will provide fifteen hard copies and an electronic CD of the draft report to the Task Force for review and comment. We will allow six weeks for review of the draft report prior to preparing the final report (this will enable us to distribute the draft report at least 2 weeks prior to a scheduled Task Force meeting, discuss the draft report at the meeting, and discuss the comments and revisions at the subsequent month's meeting). Once all comments have been addressed and the document has been finalized we will deliver fifteen hard copies and a CD of the final Annual Report to the Task Force.

The 2011 Annual Report will require a more intensive effort than the previous year (2010) report inasmuch as it will address the Regional Board's comments on the 2010 report outlined in their letter dated March 16, 2010. Brown and Caldwell prepared a detailed comment and response document that describes how we will incorporate each comment into the 2011 report, along with our assumptions. A copy of this comment and response document is attached.

Plan Integration

Brown and Caldwell will complete the integration of three plans: the Modeling Update Plan, Aquatic Plant Management Plan, and Sediment Nutrient Reduction Plan. Some of this work will have been completed during fiscal year 2009-10 in order to meet a Regional Board submittal deadline of June 15, 2010. However, subsequent work will be performed in fiscal year 2010-11 to prepare an Executive Summary that integrates the three plans. Coordination with the Task Force and Regional Board is also included.

BMP Implementation Strategy Development

At the direction of the Task Force, Brown and Caldwell will prepare an Implementation Strategy for Best Management Practices (BMP) addressing nutrient inputs to the margins of Big Bear Lake. The Plan and Schedule for In-Lake Sediment Nutrient Reduction submitted to the Regional Board on April 15, 2010 included this Strategy as a deliverable (Stage 1, Task 3) to be completed by July 2011. The Strategy would be a first step to implement the Wasteload Allocation (WLA) for external sources of sediments and nutrients to Big Bear Lake.

The BMP Implementation Strategy would provide detail on issues that were raised when describing opportunities to enhance current practices of dredging and lake treatment. Specific questions that would be addressed by the Strategy include:

- Can new nutrient inputs to the lake be isolated by preparatory dredging and/or deployment of silt fences?
- Would addition of flocculants (e.g., alum) or binding agents (e.g., Phoslock®) after a storm inhibit the release of phosphorous from sediments along the margins to the lake?
- How soon after a storm event would flocculent or binding agent addition be needed to be effective?
- What is the cost of preparatory dredging, silt fence deployment, and lake treatment along the margins?
- What is the expected benefit of implementing a margin management strategy for in-lake sediments as compared to no action or a hypolimnetic oxygenation system alone?

The Strategy would propose an adaptive approach to evaluate these questions using pilot projects that are scaled to match available resources. The strategy will define specific pilot projects to be conducted, a schedule

for pilot project implementation, estimates of probable costs for labor and materials, expected outcomes, monitoring approaches to evaluate effectiveness, and a process for defining future projects based on the outcomes of pilot studies.

The cost estimate for this task includes a contingency, in the event that the comments from the SARWQCB or Task Force members require refinement of the strategy.

Proposition 84 Grant Application Preparation (Optional Task)

The State of California Department of Water Resources is in the process of allocating grant funding for projects under Proposition 84. Approximately $114 million in Prop. 84 money is allocated to the Santa Ana region. In developing the Sediment Nutrient Reduction Plan, a key candidate project involves the construction of a Hypolimnetic Oxygenation System (HOS) that could provide considerable benefits to the Big Bear Lake community both in terms of achieving TMDL targets for phosphorous reduction as well as protecting or even enhancing the beneficial uses of the Lake. Design and construction of the HOS potentially fulfills the objectives for regional projects that may qualify for a grant under Prop. 84. The grant application process is a two-step submittal that involves an initial online submittal by June 30, 2010, followed by the preparation of a more extensive grant proposal package. Depending on the timing of this process, Brown and Caldwell is including an optional task for preparing the full grant proposal package.

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Analytical Laboratory

E.S. Babcock & Sons, Inc. and GEI Consultants (Baseline and Snowmelt Nutrients)

Water Samples			No. Samples	No. Samples	Total No.	
Parameter	Method	Unit Price	Monthly	2 Storms	Samples	Total Price
Ammonia-N	SM 4500NH3H	$27.00	80	15	95	$2,565.00
Biochemical Oxygen Demand	SM 5210B	$45.00	80	15	95	$4,275.00
Chemical Oxygen Demand	SM 5220D	$25.00	80	15	95	$2,375.00
Total Hardness Package	Varies	$30.00	80	15	95	$2,850.00
Alkalinity	SM 2320B	$13.00	80	15	95	$1,235.00
Ortho-phosphorous	SM 4500PE	$27.00	80	15	95	$2,565.00
Total Phosphorous	SM 4500BE	$32.00	80	158	238	$7,616.00
Total Dissolved Phosphorous	SM 4500BE	$32.00	80	15	95	$3,040.00
Total Suspended Solids	SM 2540D	$15.00	80	158	238	$3,570.00
Volatile Suspended Solids	EPA 160.4	$15.00	80	15	95	$1,425.00
Total Organic Carbon	SM 5310B	$45.00	80	15	95	$4,275.00
Dissolved Total Organic Carbon	SM 5310B	$45.00	80	15	95	$4,275.00
Total Nitrogen Package (wet-weather)	Varies	$71.00	0	158	158	$11,218.00
Total Nitrogen (Baseline/Snowmelt)		$32.00	80	0	80	$2,560.00
Total Dissolved Nitrogen (Baseline/ Snowmelt)		$32.00	80	0	80	$2,560.00
Nitrate/Nitrite N (Baseline/Snowmelt)		$27.00	80	0	80	$2,160.00
Sample Filtration	N/A	$14.00	80	158	238	$3,332.00
Shipping to GEI	Fed Ex	$75.00	12	0	12	$900.00
						$0.00
Subtotal						$62,796.00
Total Cost, Water Analysis (Including 5% Markup)						$65,935.80

Note: Includes 10% additional samples for QA/QC. No sampling at Bear Creek outlet.

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Consultant Other Direct Charges (ODCs)

Consultant: Brown and Caldwell

Travel

Type	Rate	Units	Cost
Mileage - (assumes 10 trips @ 200 mi./ea)	$0.51	2,000	$1,010.00
Meals/Incidentals	$8.00	20	$160.00
Airfare (K. Abusaba - 6 trips)	$350.00	6	$2,100.00
Total Travel			$3,270.00

Other Direct Costs

Description	Unit Cost	Units	Cost
Misc. Monitoring Supplies (disposable sampling equipment, gloves, etc)	$100.00	1	$100.00
Ice	$5.00	36	$180.00
Deionized Water (2 gal/event)	$10.00	20	$200.00
Equipment Rental/Chargeout (Flow and Horiba meter)	$250.00	8	$2,000.00
Total Other Direct Costs			$2,480.00

Cost Estimate: Brown and Caldwell

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Start Date: 7/1/2010 End Date: 6/30/2011

Task Number #	Description of Task/Subtask	Project Managerr: Nancy Gardiner	Supervising Scientist: K. Abusaba	Engineer II: Brett Bennetts/ Soumya Kini	Project Chemist - Greg Cole	Graphics Support: Susan Sicora	Sr. Technician: Jim Atkinson	Field Technician	Sr. Field Technician	Field Technician	Project Assistant: Janelle Kaminski	Word Processor	Total Hours	Subtotal Cost	Total Cost
1	**Progam Oversight, Project Management, and QA/QC (FY 2010-11)**														
	Attend Subset of Monthly Task Force Meetings (Assumes 6 meetings)	36.0	24.0										60.0		11,427.31
	Laboratory Coordination and QA/QC (QA/QC inlcudes review of laboratory data)	8.0		16.0	4.0								28.0		3,872.88
	General Project Management	24.0				8.0					8.0		40.0		6,320.82
														$21,621.02	
2	**Watershed-Wide Monitoring (FY 2010-11)**														
	Field Preparation: Bottle acquisition and labeling, preparation of sampling materials, calibrating equipment, field forms, etc. - spread across all monitoring events, approximately 2 hours per event)	4.0		24.0									28.0		3,157.98
	Monthly Baseline Sampling: Coordination with SBCFCD and laboratories only. It is assumed that SBCFCD will sample all 8 months as part of their "in-kind" contribution.	8.0											8.0		1,643.88
	Bimonthly Snow Melt Sampling: Conduct Bi-Monthly Snow Melt sampling (Assumes 1 event betweeen November and March; assumes 2 staff x 14 hours per event). Includes transporting samples to analytical laboratory. It is assumed that SBCFCD will handle the other 2 months.	2.0		8.0			14.0	21.0					45.0		4,075.31
	Winter and Summer Storms: Monitor 2 Storm Events, One Winter and One Summer (Assumes 2 teams of 2 staff each x 14 hours x 2 shifts). Includes transporting samples to analytical laboratory.	16.0		28.0			48.0	24.0	48.0	48.0			212.0		20,353.46
	False Starts: Assumes 3 false starts (mobilization without successful storm capture). Note that summer "monsoonal" type storms are spotty and difficult to capture. Cost savings may be realized if local staff are available to capture summer storms.	6.0		12.0			18.0	12.0	18.0	12.0			78.0		7,551.59
														$36,782.22	
3	**Data Management and Reporting (FY 2010-11)**														
	Preparation of Data Spreadsheets (SWAMP Compatible)	2.0		24.0								12.0	38.0		3,662.76
	Preparation of Statistical Data Summaries and QA/QC	4.0			20.0	4.0						8.0	36.0		5,179.99
	Incorporate Comments from RWQCB	12.0	16.0	20.0	2.0							8.0	58.0		8,045.41
	Draft Annual Report	8.0	8.0	40.0							2.0	16.0	74.0		8,254.19
	Final Annual Report	4.0		8.0								4.0	16.0		1,905.87
														$27,048.23	
4	**Plan Integration (Modeling, Aquatic Plant & Sediment Nut.)**														
	Final Executive Summary	2.0	8.0									8.0	18.0		2,364.76
	Coordination with RWQCB	2.0	16.0			6.0					2.0	2.0	28.0		3,986.80
														$6,351.56	
5	**BMP Implementation Strategy**														
	Kickoff Meeting	8.0	8.0										16.0		2,987.16
	Data Gathering and Research	24.0	40.0	60.0		8.0					8.0	8.0	148.0		19,487.85
	Draft Implementation Strategy	40.0	60.0	40.0		24.0					8.0	20.0	192.0		26,660.23
	Final Implementation Strategy	12.0	16.0	20.0		16.0					2.0	12.0	78.0		9,724.83
														$58,860.07	
6	**Preparation of Proposition 84 Grant Application for HOS (Optional Task)**														
	Draft Application	16.0	40.0	20.0		8.0						16.0	100.0		13,950.57
	Final Application	8.0	24.0	12.0		4.0						8.0	56.0		7,841.60
														$21,792.16	
	Total Hours by Employee	246.0	260.0	332.0	26.0	78.0	80.0	57.0	66.0	60.0	30.0	122.0	721.0		
	Loaded Hourly Rate	205.49	167.91	97.34	167.91	97.34	92.64	75.65	92.64	75.65	76.31	76.31			
	Total Labor Cost for Prime Consultant, FY 2010-11														**$172,455.26**

Total Cost	
Labor	$172,455.26
Travel	$3,270.00
Other Direct Costs	$2,480.00
Analytical Costs	$65,935.80
Contingency*	$15,000.00
Total Cost	**$259,141.06**

* Note that $15,000 has been included as a contingency in the event that the comments from the SARWQCB or Task Force members require refinement of the strategy.