NOTE: If you wish to address the MWD Board of Directors during discussion of an agenda item, or during the PUBLIC FORUM, please complete a Speaker Request card (blue in color) and give it to the Board Secretary. Unless a detailed presentation of an agenda item is required by the Board of Directors, it is requested that each speaker limit comments to FIVE MINUTES. All testimony given before the Board of Directors is tape recorded.

AGENDA
BIG BEAR MUNICIPAL WATER DISTRICT

BOARD OF DIRECTORS
Regular Meeting
August 5, 2010

PLACE: Big Bear Municipal Water District
40524 Lakeview Drive, Big Bear Lake, CA 92315

Next Resolution Number: 2010- 06

OPEN SESSION: 1:00 P.M.

1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE

3. DISCUSSION AND ACTION ON CLOSED SESSION ITEMS

4. REPORTS
A. General Manager
B. Lake Manager
C. Legal
D. Committee
E. Other

5. CONSENT CALENDAR
A. Minutes of a Regular Meeting of July 15, 2010
B. Minutes of a Special Meeting of July 27, 2010
C. Warrant List Dated July 30, 2010 for $250,645.33

6. BUSINESS
A. Consider approval of termination of dock agreement and reconveyance for Edgewater Dock

7. PUBLIC FORUM
(The Board will receive comments from the public on items not on the agenda; no action is permitted on these items. Time set aside not to exceed 30 minutes total by all participants)

8. ANNOUNCEMENTS

9. DIRECTOR COMMENTS

10. ADJOURNMENT

NEXT MEETING: Open Session at 1:00 P.M.
Thursday, August 19, 2010
Big Bear Municipal Water District
40524 Lakeview Drive, Big Bear Lake, CA

MINUTES OF A REGULAR MEETING OF BIG BEAR MUNICIPAL WATER DISTRICT HELD ON THURSDAY, JULY 15, 2010

CALL TO ORDER

President Fashempour called the Open Session to order at 1:00 PM. Those in attendance included Director Suhay, Director Smith, Director Murphy, District Counsel Wayne Lemieux (via Skype), General Manager Scott Heule, Lake Manager Mike Stephenson, and Board Secretary Vicki Sheppard.

REPORTS

General Manager, Scott Heule reported that he and four of the Directors (President Fashempour, Director Suhay, Director Eminger and Director Murphy), went to the ACOE Change of Command Ceremony and thought it was very successful. He commented that lake use on the July 4th holiday was a little down in numbers from last year. He added that the Chamber of Commerce reported that lodging did well over the holiday. He stated that he attended the North Shore Improvement Association meeting last night reporting that it went well. Mr. Heule reported that he attended the Chamber of Commerce meeting this morning and a representative from State Senator Dutton's office was there talking about what is going on in Sacramento. He added that the Chamber reports that they are going to be hosting a candidate public forum after Labor Day. Mr. Heule reported that he and Mr. Stephenson met with Anna Milloy and Jeff Brandt from Department of Fish & Game yesterday regarding the District's MOU with them. He stated that it was a very positive meeting adding that they seem willing to allow us permission to do whatever is needed. Mr. Heule reported that the trout pond is up for sale again.

Lake Manager, Mike Stephenson reported that the limnological report is very interesting. He explained that the lake is half stratified and the clarity and oxygen is good in some areas but the bottom has little to no oxygen. He added that the water temperature is at about 70 ° already. He commented that he would have more to report as the season progresses. Mr. Stephenson explained that they are running the aerator at the dam but haven't found it necessary to run the de-stratification unit as yet. President Fashempour asked if trout move as necessary to find the most advantageous area of water. Mr. Stephenson explained that they do move to the cooler parts of the lake as needed. He reported that weed treatments are going well adding that they are almost done treating. He stated that they will start harvesting in certain areas soon. He commented that the staff BBQ went very well. Mr. Stephenson reported that the bear-proof cans that were purchased with the Forest Service will be installed next week. He explained that 8 double cans (16 cans total) were purchased with the Forest Service (cost share 50/50) with the Forest Service doing the installation. He explained that participation in the carp tournament was up. Mr. Stephenson reported on the meeting with Department of Fish & Game explaining that they trust us to do what is best without specific approvals for each and every project. Director Smith asked when Fish & Game did the last fish plant. Mr. Stephenson reported that it was last Thursday. He added that they are doing approximately 2 ½ stockings per month. He added that they are not stocking many other lakes commenting that Big Bear Lake is very lucky.

District Counsel Wayne Lemieux reported that at the last Board meeting they met in closed session regarding the Conroy matter adding that her request was denied and there is no reportable action.

APPROVAL OF CONSENT CALENDAR
Mr. Heule explained that the Warrant List was very large due to the check to Bear Valley Mutual adding that it was half of what it was last year however.

Upon a motion by Director Suhay, seconded by Director Murphy, the following consent items were unanimously approved:

- Minutes of a Regular Meeting of June 17, 2010
- Minutes of a Special Meeting of June 21, 2010
- Warrant List Dated July 9, 2010 for $1,588,434.52
- Approval of the Notice of Completion of the Carol Morrison East Public Launch Ramp Paving and Decontamination Station Construction
- Approval of CSDA Board of Directors Election
- Approval of CSDA By-Laws changes

District Counsel Wayne Lemieux left the meeting at 1:26 pm

UPDATE ON ARMY CORPS OF ENGINEERS EXOSYSTEM RESTORATION STUDY PRESENTATION ONLY, NO ACTION
Kathleen Bergmann and Dr. Josephine Axt made a presentation to the Board (copy attached). Ms. Bergmann stated that they are tentatively recommending Alternative 4. She explained that if a proposal has a recreational element in it, it would probably not be allowed since it needs to be Ecosystem Restoration and not recreational. Ms. Bergmann discussed the alum treatments and re-claimed water asking if they are really needed in the proposals. It was the consensus of the Directors that alum treatments should probably be removed but it was decided that a workshop meeting should be held to make a final decision about reclaimed water.

Mr. Pete Gwaltney, General Manager of Big Bear Airport, came to observe the meeting. He added that some of the options presented would involve enlarging migrating bird populations which could present a problem to the airport. He stated that he felt the District and ACOE needed to make a presentation to the Airport Board of Directors.

Mr. Heule asked what the next step should be with the Airport.

Ms. Bergmann stated that they would need to get together with District Committees and then make a presentation to the Airport Board.

Dr. Axt asked Mr. Gwaltney if he could send them information on migrating birds. Mr. Gwaltney stated that he would.

Mr. Heule stated that he would get together study materials and have the airport information available for a workshop. President Fashempour and the Directors determined that a special workshop should be scheduled the last week in July.

ANNOUNCEMENTS
Mr. Heule reported that he would taking Friday off to go to Parker AZ. He added the Mr. Stephenson would be taking a few days off next week to go on a fishing trip.

DIRECTOR COMMENTS
Director Murphy reported that the Paddlefest seemed to go very well. President Fashempour commented on the staff barbeque stating that she appreciated all of the staff participation.

ADJOURNMENT
There being no further business, the meeting was adjourned at 3:04 P.M.

NEXT MEETING Open Session at 1:00 P.M.
Thursday, August 5, 2010
Big Bear Municipal Water District
40524 Lakeview Drive, Big Bear Lake, CA

_____

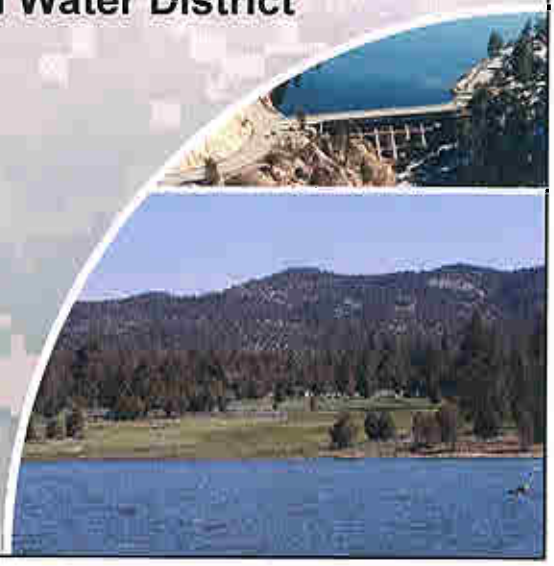
Vicki Sheppard
Secretary to the Board
Big Bear Municipal Water District

(SEAL)

Big Bear Lake Ecosystem Restoration Study

Big Bear Municipal Water District Board Meeting

15 July 2010



US Army Corps of Engineers
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Problems & Opportunities

- Pre-dam, the basin supported a 6000 acre marsh/meadow complex with a 500-1000 acre semi-perennial lake
- Aquatic
  - Non-native vegetation displacing native aquatic species
  - High nutrient levels
  - Carp out competing more desirable fish species
  - Changing natural ecosystem (changing or being changed)
  - Summer algae blooms and lack of water clarity
- Marsh, Meadow, Riparian
  - Remaining marsh/meadow/riparian habitats disappearing
  - Impact of development on adjacent riparian zones increasing erosion
  - Exotic vegetation establishment near development

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Study Assumptions

- The dam and existing lake are vital to the region and will not be removed
- Tributaries on the North shore are trapping sediment at an acceptable rate
- Tributaries on the South shore are degrading
- Restoration of the surrounding shoreline and watershed will improve the lake ecosystem
- Fires have not yet significantly affected the lake
- Restoration goals must follow Corps guidelines
- Reclaimed water will be available

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STUDY OBJECTIVES

Objectives		
Restore Lacustrine Ecosystem	Restore multi-tiered self-sustaining warm & cold water fishery	0.052
total = 0.258	Restore native aquatic plant community	0.133
	Restore/improve migratory waterfowl habitat	0.073
Restore Shoreline Riparian Ecosystem	Restore/improve shoreline marsh/meadow area	0.160
total = 0.309	Restore/improve shoreline riparian areas	0.095
	Restore/improve raptor bird habitats	0.054
Restore Riparian Ecosystem on Tributaries	Restore/improve tributary creek habitat for amphibians	0.117
total = .433	Restore/improve riparian habitat for migratory birds	0.114
	Restore/improve marsh and meadow habitat on tributaries	0.202
		1.00

Objectives were weighted and this was used to evaluate measures and alternatives using for Effectiveness.

This allow us to screen an initial array of 67 alternatives down to 13 for quantative analysis

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Preliminary Array

1. No Action Alternative

Comprehensive Alternatives:

2. Comprehensive Alternative A
3. Comprehensive Alternative B

Lake Alternatives:

4. Lake
5. Lake and Shoreline
6. Lake and Marsh
7. Lake and Meadow
8. Lake and Riparian

Shoreline Alternative:

9. Shoreline

Meadow Alternatives:

10. Meadow and Lake
11. Meadow and Riparian

Vegetation Restoration Alternatives:

12. Aquatic Plant
13. Invasive Removal and Restoration

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Costs & Habitat Analysis

Plan	Cost w/o OM & Real Estate	Cost w/o O&M but w/Real Estate		O&M Only		Total Acres	Initial Uplift (Hus)	Secondary Uplift (Hus)	TOTAL UPLIFT
Alt A	$49,644,116.53	$78,499,518.53		$ 428,838.00	Alt.2 Comprehensive A	2832.53	413.8	109.8	523.6
Alt B	$133,850,466.51	$162,746,281.51	Max	$1,325,251.00	Alt.3 Comprehensive B	3102.89	1679.1	205.9	1775.4
4	$62,985,587.54	$71,509,824.54		$ 988,160.00	Alt.4 Lake	2871.30	1518.8	213.9	1732.7
5	$101,936,429.96	$114,155,467.96		$ 1,144,682.00	Alt.5 Lake and Shoreline	3028.74	1554.3	204.4	1758.7
6	$87,976,030.68	$108,090,198.68		$ 234,624.00	Alt.6 Lake and Marsh	1273.96	168.5	106.1	270.6
7	$50,732,058.33	$76,837,390.33		$ 490,686.00	Alt.7 Lake and Meadow	1145.80	85.1	100.1	185.2
8	$86,510,821.06	$125,080,046.06		$ 1,090,347.00	Alt.8 Lake and Riparian	2834.25	1496.6	196.0	1692.6
9	$57,666,558.04	$81,289,003.04		$ 295,899.00	Alt.9 Shoreline	693.73	76.7	8.3	84.0
10	$47,833,085.53	$71,443,032.53		$ 479,245.00	Alt.10 Meadow and Lake	1177.83	74.3	107.7	182.0
11	$18,266,400.45	$46,841,980.45		$ 330,473.00	Alt.11 Meadow and Riparian	328.36	40.2	0.0	40.2
12	$24,402,281.12	$33,131,316.12	Min	$ 143,608.00	Alt.12 Aquatic Planting	486.28	68.5	8.3	71.8
13	$29,445,255.71	$68,024,599.71		$ 318,608.00	Alt.13 Invasives Removal	678.09	89.4	0.0	89.4

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Incremental Analysis
Cost Effectiveness

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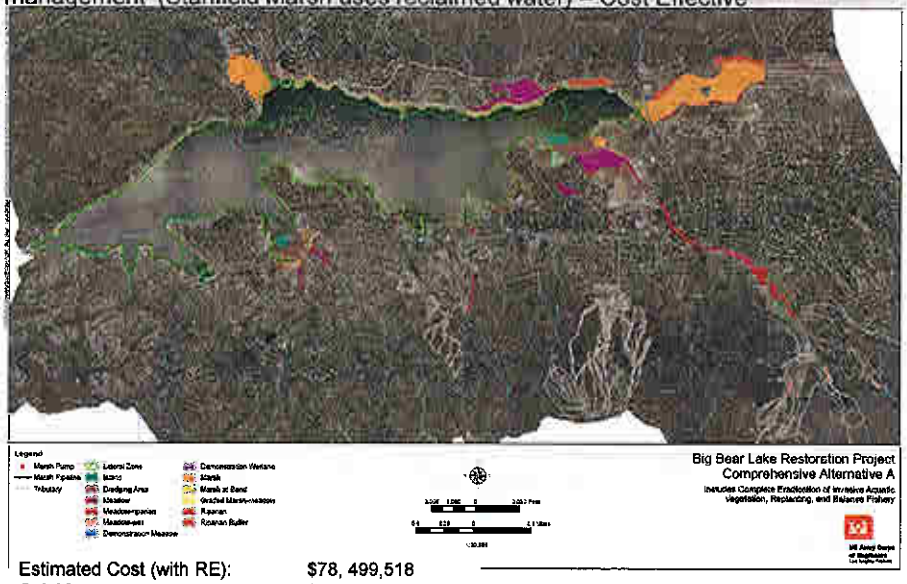
Alternative 2 - All Measures except pumps & pipelines, soil caps, alum, carp management (Stanfield Marsh uses reclaimed water) – Cost Effective



Estimated Cost (with RE):	$78, 499,518
O & M	$408,838
Habitat Units:	523.5
Acres:	2832.53

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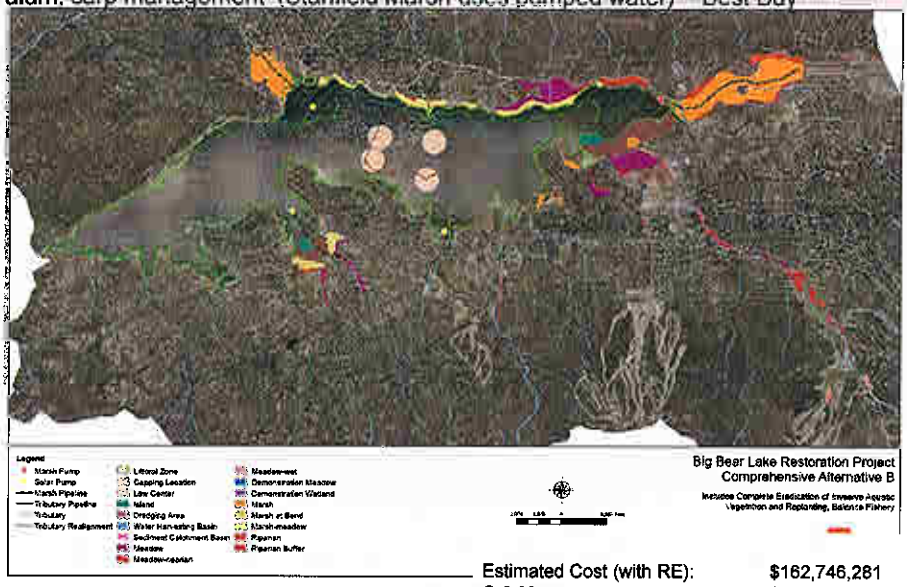
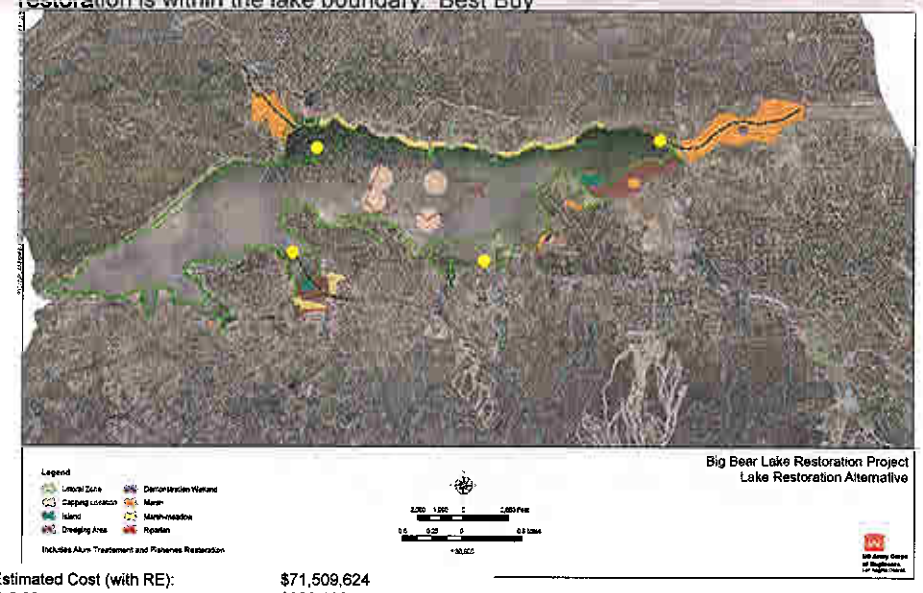
Alternative 3 – Includes All Measures except pumps & pipelines, soil caps, alum, carp management (Stanfield Marsh uses pumped water) – Best Buy



Estimated Cost (with RE):	$162,746,281
O & M	$1,325,251
Habitat Units:	1775.4
Acres:	3102.89

Alternative 4 – Focuses on Lake only measures. Marsh and meadow restoration is within the lake boundary. Best Buy



Estimated Cost (with RE):	$71,509,624
O & M	$988,160
Habitat Units:	1732.7
Acres:	2871.30

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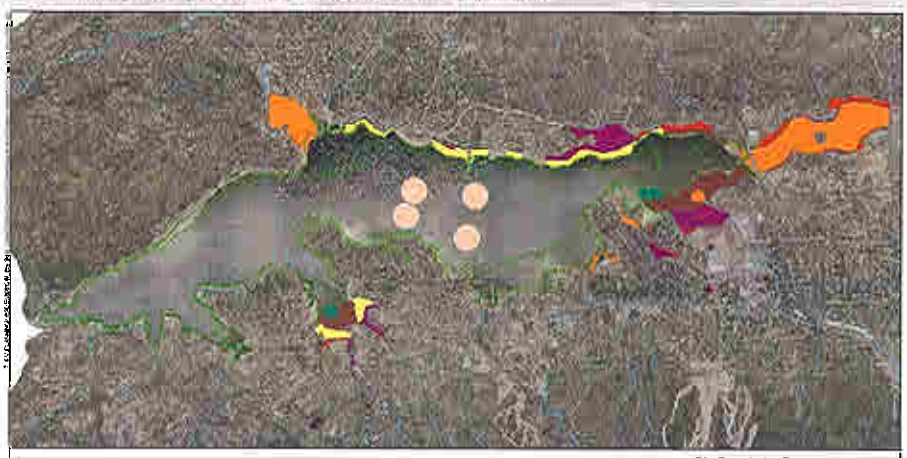
Alternative 5 – Focuses on Lake and Shoreline location measures. (Stanfield Marsh water supply is reclaimed water) – Best Buy



Estimated Cost (with RE):	$114,155,467
O & M	$1,144,682
Habitat Units:	1758.7
Acres:	3029.74

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Alternative 10 – Focuses on Meadow & Lake location measures. (Stanfield Marsh edges are restored) – Cost Effective

Estimated Cost (with RE):	$71,443,032
O & M	$479,245
Habitat Units:	182
Acres:	1177.83

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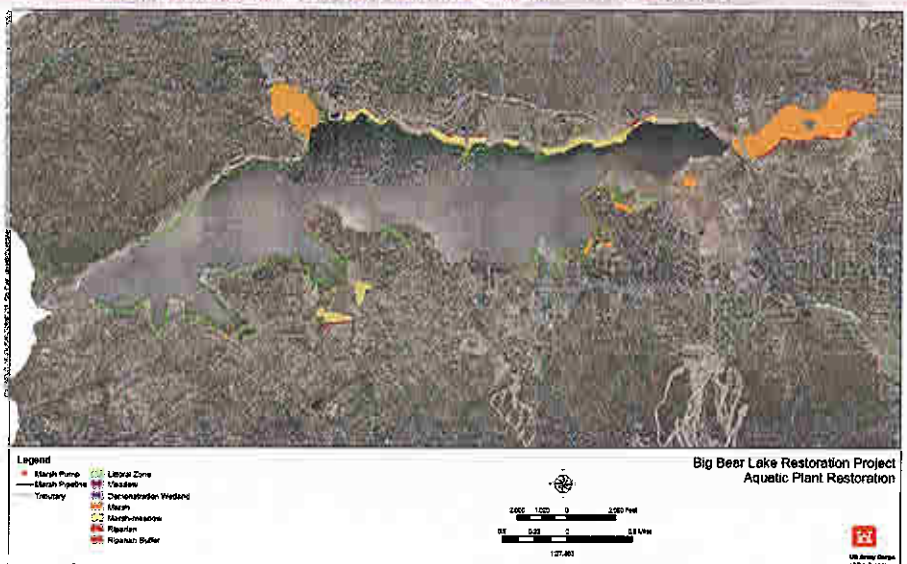
Alternative 12 – Focuses on Aquatic and planting only within lake boundaries measures. (Stanfield Marsh uses reclaimed water) – Cost Effective



Estimated Cost (with RE):	$33,131,316
O & M	$143,608
Habitat Units:	71.8
Acres:	486.28

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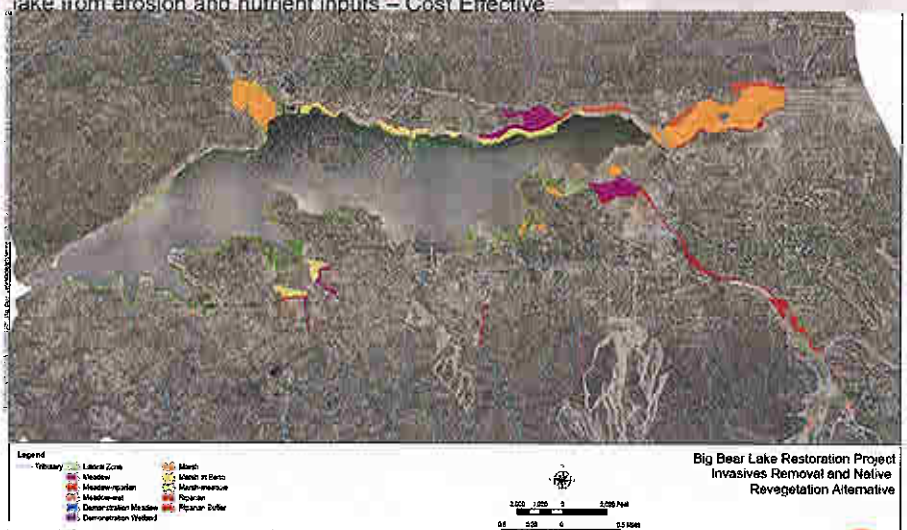
Alternative 13 – Focuses on all restoration locations with invasive removal and replanting. Provides protection from development keeping open spaces and protects lake from erosion and nutrient inputs – Cost Effective



Estimated Cost (with RE):	$58,024,599
O & M	318.608
Habitat Units:	89.4
Acres:	678.09

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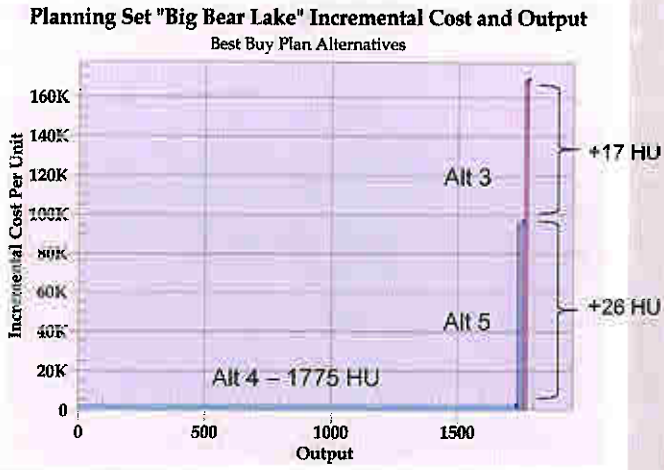
Incremental Analysis
"Best Buys"



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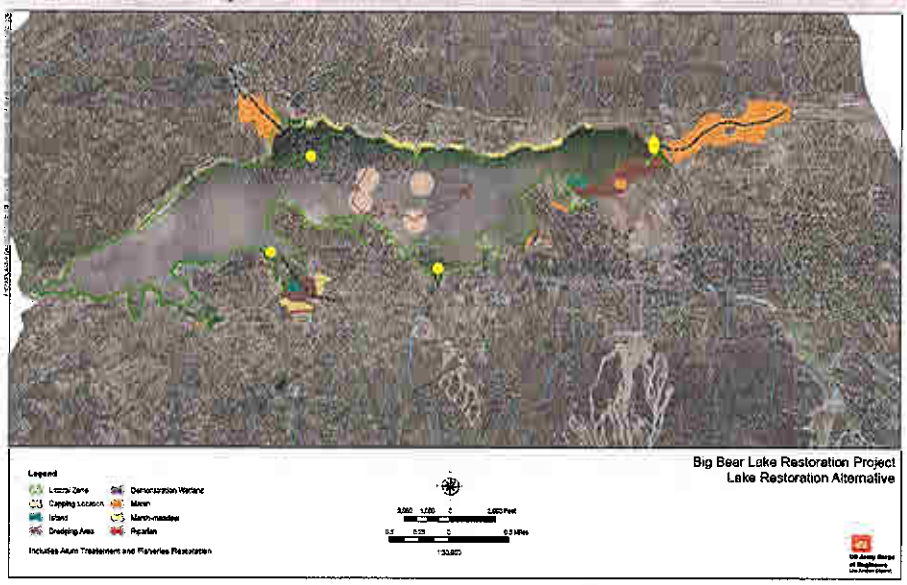
Tentatively Recommended Alternative 4: Lake



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Alternative Strengths

- Restores Aquatic Habitat
- Restores Marsh-Meadow & Riparian Habitat
- Sequesters Nutrients with alum treatment and capping
- Manages Invasive Plants and Fish
- Drought Management measures for Stanfield Marsh and Fish Spawning (Pump and Pipeline Systems)

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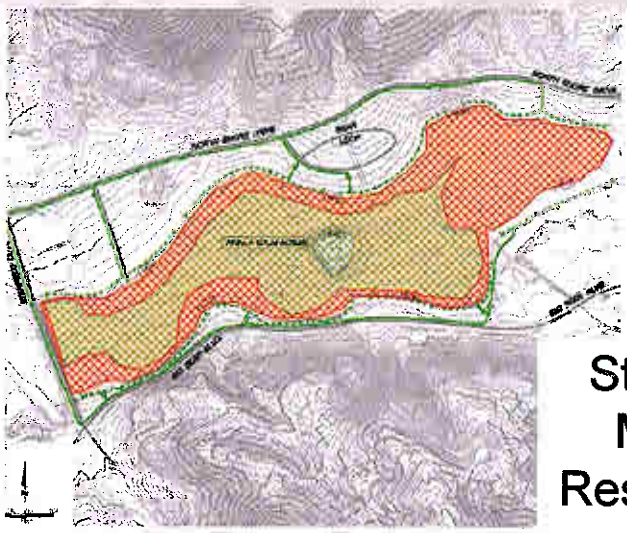

Stanfield Marsh Restoration

Figure 3. The area above elevation 6736 (red) is most feasible for creation of permanent marsh and represents about half (60 acres) of the 121 acres in the target area. The most suitable area is 30 acres in the far eastern section. Area below the 6736 contour will be subjected to extended (multiple year) inundation.

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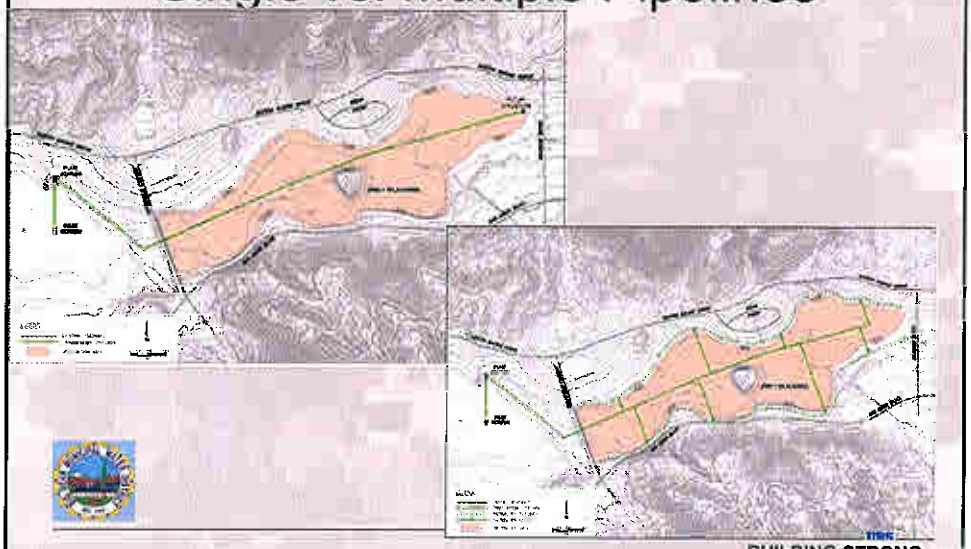
Single vs. Multiple Pipelines



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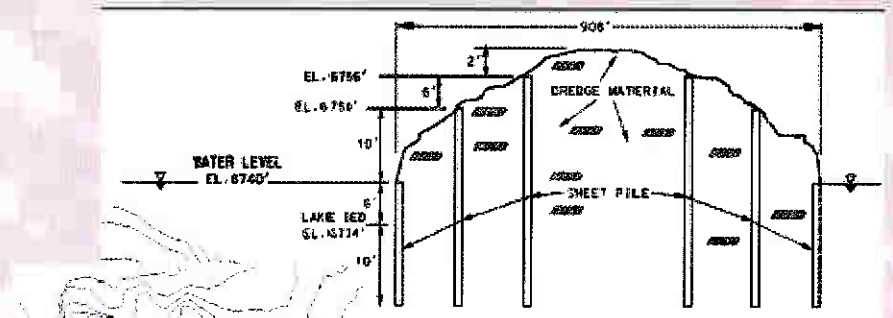
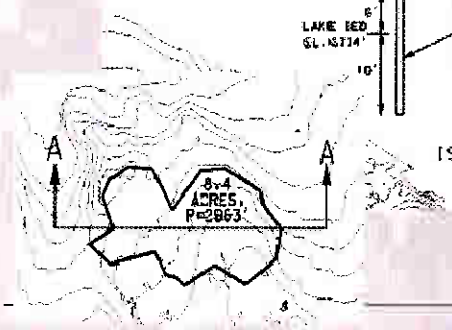
Island Typical Design





ISLAND SECTION A-A TYPICAL

N.T.S.

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Potential Terrace Design

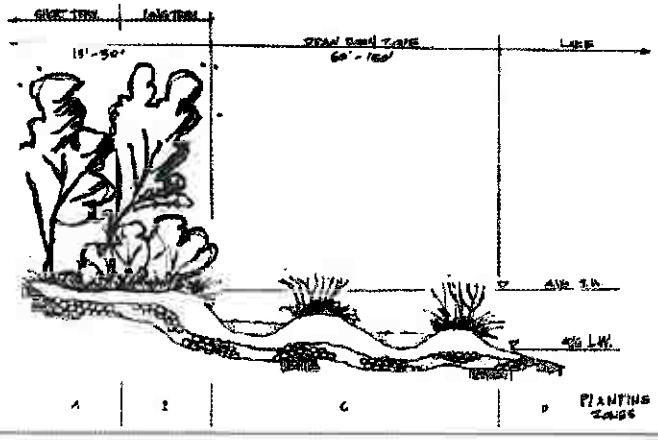

FIGURE 1: DRAW DOWN ZONE CONCEPT

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Big Bear Lake Ecosystem Restoration Study

Schedule

UPCOMING STUDY MILESTONES

	Start	Finish
Contractor Report Preparation of F4	5/21/2010	9/28/2010
Agency Tech Review of F4	9/30/2010	10/29/2010
Division Tech Review	11/2/2010	12/2/2010
F4 Review Conference		12/18/2010
Likely Funding delay due to no FY 11 Budget. If optimal funding of $455,000 the following dates apply:		
AFB Report Preparation	1/10/2011	2/24/2011
Technical Review AFB	2/26/2011	4/12/2011
AFB Package to SPD/HQ	4/14/2011	5/14/2011
AFB		5/14/2011
Report Preparation-Draft Report (F5)	6-Dec-11	4-Jan-12
Technical Review-Draft Report	4-Jan-12	3-Feb-12
Public Review of Draft Report (F5)	3-Feb-12	
Feasibility Public Review Period (F5)	3-Feb-12	7-Mar-12
Prepare Final Public Meeting (F6)	3-Feb-12	10-Feb-12
Final Public Meeting(F6)	7-Mar-12	9-Mar-12
Feasibility Review Conference (F7) (CW050)		9-Mar-12
Report Preparation-Final Report (F8)	9-Mar-12	10-Apr-12
Technical Review-Final Report	10-Apr-12	24-May-12
Feasibility Report with NEPA to SPD (F8) (CW160)		24-May-12
SPD DST Review and Preparation of DE's Notice	24-May-12	15-Jun-12
MSC Commander's Public Notice (F9) (CW260)		15-Jun-12

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Big Bear Lake Ecosystem Restoration Study

Cost Share Through F4

	Federal Funds	Local Work In Kind (WIK)	
Prior to FY 10	$3,485,977	$3,535,820	Credited Through May 2007
		$67,000	Additional PMP In-Kind through F4
		$119,584	GM and Lake Manager June 2007 through F4 at 1.5 days/month
		$64,500	Water Master Reports for 2008 & 2009
		$94,000	Lake Water Quality Sampling/Analysis for 2008 & 2009
		$96,700	Beneficial Use Map - Remetrix
		$12,900	Beneficial Use Map - Consultant and Staff
		$31,400	Aquatic Plant Management Plan - Consultant
		$14,100	ACOE Sediment Sampling Data Evaluations - Consultant
		$13,610	Annual Lake Weed Mapping
		$36,000	Sediment Sampling Big Bear Marina
FY 10	$577,000		
Total	$4,062,977	$4,085,614	

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Big Bear Lake Ecosystem Restoration Study

Budget to Complete

Project Management	40.0	Cost	60.0
Analyst	10.0	Real Estate	55.0
Scheduler	6.0	Regulatory	10.0
Plan Formulation	80.0	Contracting	7.0
Geology	8.0	Contracts	100.0
Soils	5.0	Reviews	220.0
Design	25.0	Travel	10.0
H & H	20.0	Sub Total	831.0
Water Quality	15.0		
Sediment	20.0	Total DIV & Branch Technical Management Subtotal	77.5
Economics	20.0	TOTAL CASH	908.5
Environmental Coordination	40.0		
Biology	40.0	WIK	92.6
PCX Model Cert	35.0		
Cultural	25.0	TOTAL	1,021.1

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Big Bear Lake Ecosystem Restoration Study

Cost Share to Complete

In Thousands

POST F4	WIK	Cash	
Carryover Balance from F4	$23.0		
Project Management	$40.0		
Plan Formulation	$20.0		
Reviews	$10.0		
TOTAL WIK	$92.6		
TOTAL CASH		$342.9	
TOTAL CONTRIBUTION			$435.5

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Issues

- Future Funding:
  - In Kind Services & Study Cost
  - Federal Funding
- TMDL Services & Corps Policy Questions
- Coordination:
  - Stakeholders (Airport)
  - Potential Partners for action taken outside BBMWD lands or authorities

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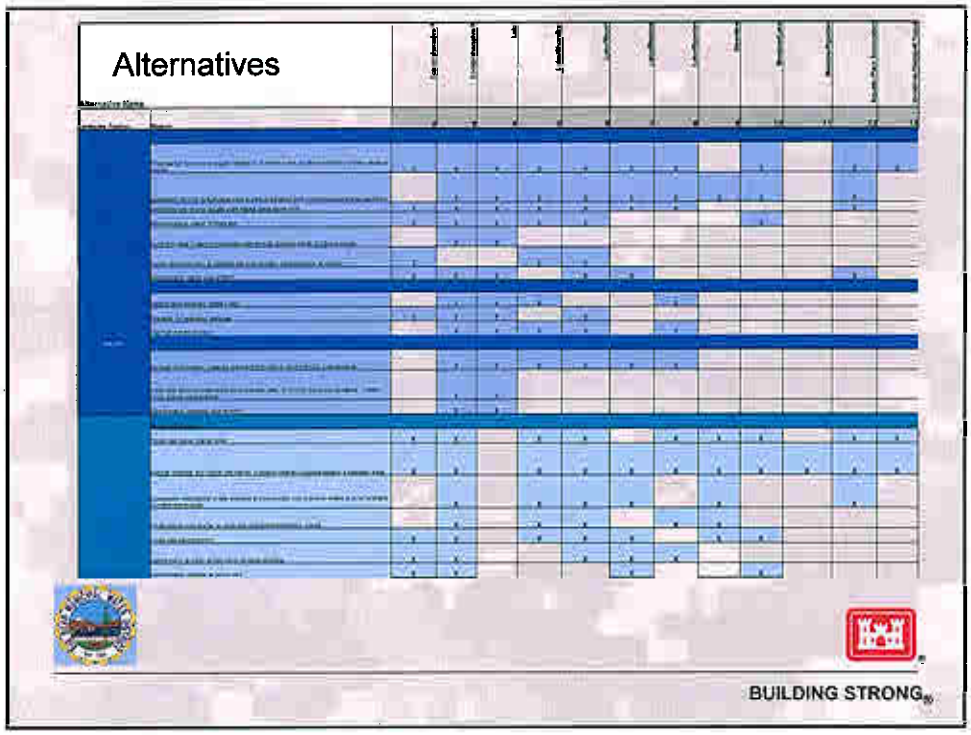
Alternatives
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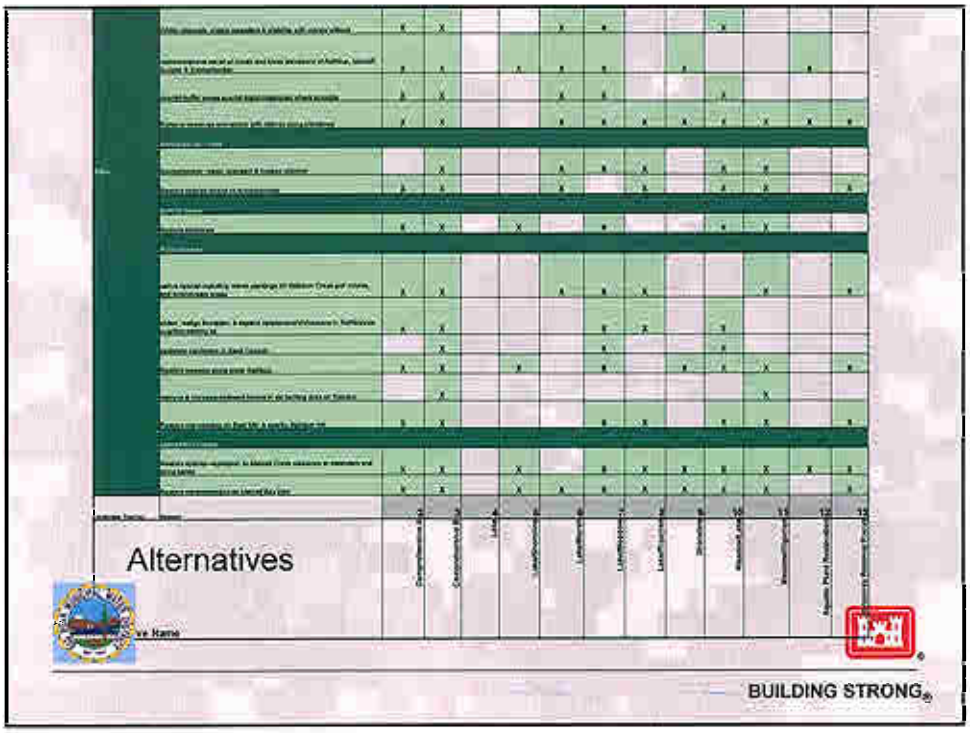
Alternatives
BUILDING STRONG®

MINUTES OF A SPECIAL MEETING WORKSHOP OF BIG BEAR MUNICIPAL WATER DISTRICT HELD ON TUESDAY, JULY 27, 2010

The Open Session workshop began at 9:30 am. Those in attendance included President Fashempour, Director Suhay, Director Murphy, Director Smith, Director Eminger, General Manager Scott Heule, Lake Manager Mike Stephenson, and Board Secretary Vicki Sheppard.

BIG BEAR LAKE ECOSYSTEM RESTROATION STUDY ALTERNATIVES WORKSHOP DISCUSSION

Mr. Heule made a brief introduction explaining that he hopes we will be able to come up with a direction on how to proceed. He listed the topics to be discussed as follows: (1) Selecting a sponsor preferred alternative from the list of cost effective and best buys described; (2) the affect of the elimination of alum treatment from the alternatives; (3) the FAA issues related to bird strikes and the airport; (4) the ACOE study schedule and costs.

Mr. Heule briefly went over the Advisory Circular from the Department of Transportation regarding land uses having the potential to attract hazardous wildlife to the vicinity of public use airports. Director Suhay asked how much power the FAA has. Mr. Heule explained that if the FAA has any problem with any of the alternatives the ACOE would not do the project. Director Smith explained that the City of Big Bear Lake Planning Commission would not approve anything that could present a safety issue to local or visiting pilots. He added that they would most likely turn it down even if the FAA approves it. Director Murphy suggested we take out any Stanfield Marsh options. Mr. Heule suggested that we could leave Stanfield Marsh options in and let the FAA eliminate them making it easier for us to pursue other plans. Director Suhay suggested that we could continue to retain Walter Yep and go to Washington DC with a proposal in mind and solicit money for a specific project. The consensus is to leave the Stanfield Marsh in for the time being. Mr. Heule went over the preferred alternatives explaining that Kathy Bergmann, ACOE, likes Alternative B. He explained that we could agree on one or make a plan of our own from the plans presented. He stated that the decision to not pursue the alum treatments was tentatively made at the last Board Meeting. He explained that when we pick a preferred alternative that is where F4 will go. President Fashempour stated if we are only going to try to get to F4 does it matter which alternative we pick? Mr. Heule explained that the F4 Document could be used to get our blanket 404 and then we could have a plan and get our design. Mr. Stephenson stated that if it stops at F4 maybe one day we could use a piece of it for our own project. Director Suhay suggested that we not use additional money to go to F5 but stop at F4 and then go for money in Washington DC on our own with the help of Walter Yep. Mr. Heule stated that he believes we could get more accomplished by concluding ACOE and concentrating on TMDL. Director Smith reported that Tim Moore believes that the ACOE can't help us at this time. President Fashempour stated that from this discussion she concludes that we are going to finish F4. Director Suhay stated that at the conclusion of F4 we could then go to Washington DC with a project (even a small project) all ready to go. Director Smith stated that perhaps we could get Jerry Lewis to commit a certain amount of money to the District and not to ACOE. Director Suhay stated that we need to have someone to lobby for us that knows where

money is available and go after it. President Fashempour asked if we want to pick an Alternative today. The consensus is that we pick Alternative 3 (Comprehensive Alternative B) minus the alum and let the FCC pull the Stanfield Marsh.
Mr. Heule stated that he will contact Walter Yep and also stay in contact with the airport. He added that he will be having a meeting with Mike Rogers, MWH. He discussed the walking bridge at the dam explaining that it is still not decided if it will be a change-order with Caltrans.
Director Suhay asked if the fishing dock at Boulder Bay Marina should have a sign saying "no boats on the fishing dock". Mr. Heule stated that the City of Big Bear Lake could decide what they wanted. Mr. Heule stated that he has been contacted by Jim Miller of the City to ask if we would be interested in partnering to finish the pedestrian walk in the Marsh. Director Smith inquired where the pedestrian walk around the marsh is proposed to end. Mr. Heule pointed it out on the map stating that it would end at the DWP well site on North Shore and Division. He added that no decision or commitment has been discussed by the District regarding finishing the walkway. Director Smith inquired about the latest information on the trout pond. Mr. Heule stated that it is up for sale again and the District will be holding a closed session on it the second meeting in August.

ADJOURNMENT
There being no further business, the workshop was adjourned at 11:16 AM.

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Vicki Sheppard
Secretary to the Board
Big Bear Municipal Water District

(SEAL)

BIG BEAR
MUNICIPAL WATER DISTRICT

Memorandum

To: Board of Directors

CC: Lake Manager

From: Scott Heule

Date: 7/20/2010

Re: Tuesday July 27, 2010 Board Workshop – Army Corps of Engineers Feasibility Study

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The attached materials are for your review prior to our next workshop on July 27, 2010 at 9:30 AM. We should attempt to select a sponsor preferred alternative from the short list of cost effective and best buys described. At this time we do not know how the elimination of alum treatment from the alternatives will affect the rating scales. I have also attached an advisory circular from the FAA that addresses issues related bird strikes and the airport. I believe the circular is self explanatory.

Sorry for all the reading. You probably have most of the needed information already based on our earlier discussions and the ACOE presentation.

Finally, I believe it will be useful to have a candid discussion about how much more effort the District should expend on this study. Even with a liberal policy of in-kind contributions the District will need to come up with a cash payment to the ACOE for them to get us to the F5 level.

Thanks

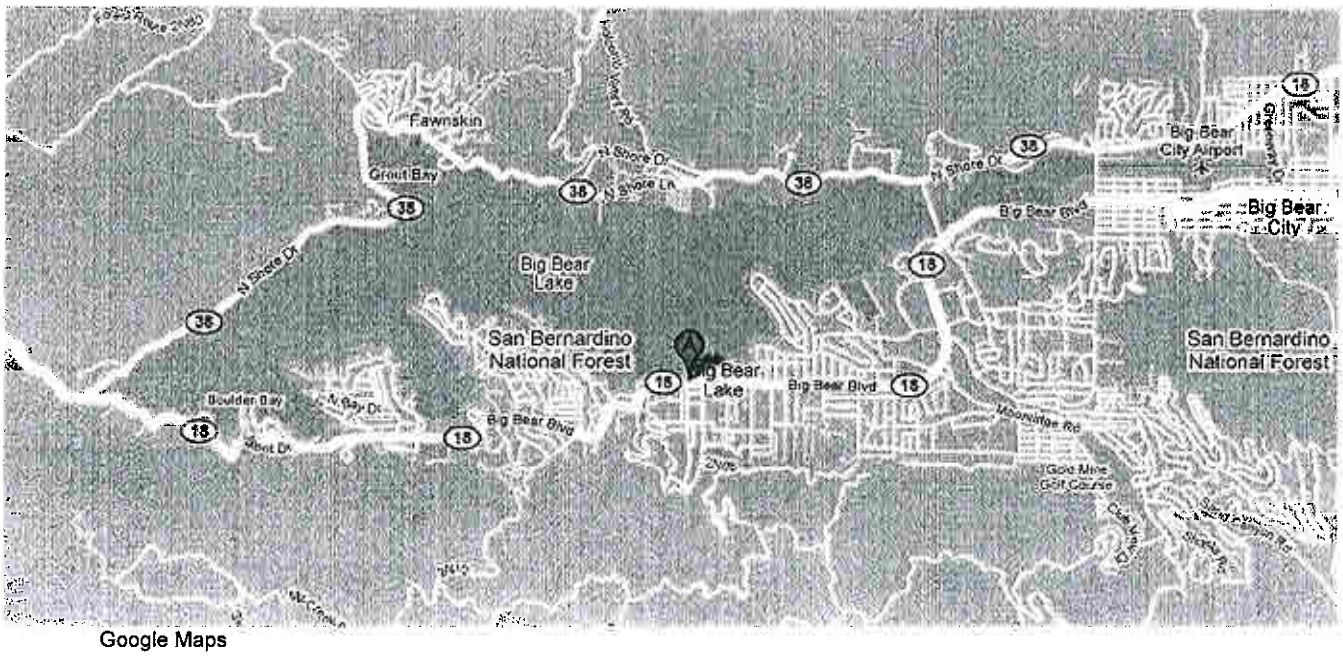
P.O. Box 2863, 40524 Lakeview Drive, Big Bear Lake CA 92315
(909)866-5796 Phone • (909)866-6485 Fax
sheule@bbmwd.org

US Army Corps
of Engineers

Big Bear Lake Feasibility Study
Cost Effectiveness and Incremental Cost Analysis of Alternatives

Economics Section
Draft
May 12, 2010

Rev 5-12-2010 edits



Google Maps

Cost of Alternatives

The cost estimates which follow were developed by the Los Angeles District Cost Engineering Section. There are 12 sets of tables. The first table shows the cost components of the alternative. The cost components are real estate, lake and shoreline measures, tributary measures, planting measures, adaptive management, planning, engineering and design (PED), construction management (S&A), and engineering during construction (EDC). Also included are contingency costs. The second table includes the cost of the O&M expenses, interest during construction and average annual costs, as well as estimates of ecosystem restoration benefits in terms of habitat units generated from the CHAP analysis.

Alternative 2 – Comprehensive A

This alternative includes most proposed restoration measures to restore the lake and surrounding riparian and marsh/meadows. Riparian and marsh/meadow areas on tributaries that have negatively affected lake health are also restored. Structural management measures such as sediment basins or major geomorphic restructuring of shoreline are not included. Fisheries are expected to benefit from this alternative, but no actions will be taken to improve them.

Table 1: Big Bear Lake Ecosystem Restoration - Cost Estimates on Comprehensive A

PROJECT: Big Bear Lake Ecosystem Restoration - Cost Estimates on Comprehensive A - Alternative 2

DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	CONTINGENCY PERCENT
Real Estate	**$28,855,402**		**$28,855,402**	0.0%
Lake & Shoreline Measures				
Stanfield Marsh Restoration	$385,000	$96,250	$481,250	25.0%
Tributary Measures	$4,954,375	$1,238,594	$6,192,969	25.0%
Planting Measures				
Invasives	$2,409,369	$602,342	$3,011,711	25.0%
Vegetation Type	$25,019,650	$6,254,913	$31,274,563	25.0%
Total Estimated Construction Cost	**$32,768,394**	**$8,192,099**	**$40,960,493**	25.0%
Adaptive Management (3% of Construction Cost)	$1,228,815		$1,228,815	10.0%
Planning, Engineering and Design (PED), 10%	$4,096,049		$4,096,049	10.0%
Construction Management (S&A), 6.7%	$2,744,353		$2,744,353	6.7%
Engineering During Construction (EDC), 1.5%	$614,407		$614,407	6.7%
Total Project Cost	**$41,452,019**	**$8,192,099**	**$49,644,118**	
Total Project Cost (Including Real Estate)	**$70,307,421**	**$8,192,099**	**$78,499,520**	

Table 2: Alternative 2 - Average Annual Cost

Big Bear Lake Alternative 2 - Comprehensive A	
Incremental Gains Beyond NO ACTION (AAHU)	523.53
Total Project Construction Cost (First Costs)	$78,499,520
Interest During Construction	$5,115,678
Total Gross Investment	$83,615,197
Present Value of O&M over the life of the project	$12,929,062
Total Costs	**$96,544,259**
Annual Cost of Total Gross Investment	$4,145,404
Annual Cost of O&M	$640,986
Total Annual Costs	$4,786,391
Average Annual Cost Per AAHUs	**$9,142.53**

Alternative 3 – Comprehensive B

This alternative includes all proposed restoration measures in Comprehensive Alternative A except the water source for restoration in Stanfield Marsh. This alternative is distinguished by the most additional measures.

Table 3: Big Bear lake Ecosystem Restoration - Cost Estimates on Comprehensive B

PROJECT: Big Bear Lake Ecosystem Restoration - Cost Estimates on Comprehensive B - Alternative 3				
DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	CONTINGENCY PERCENT
Real Estate	**$28,895,816**		**$28,895,816**	0.0%
Lake & Shoreline Measures				
Dredging within the Lake	$4,224,448	$1,056,112	$5,280,560	25.0%
Alum Treatment of Entire Lake	$10,000,000	$2,500,000	$12,500,000	25.0%
Fisheries Restoration	$2,000,000	$500,000	$2,500,000	25.0%
Install Solar Powered Water Pumps to Recyle Water	$5,174,325	$1,293,582	$6,467,907	25.0%
Stanfield Marsh Restoration	$7,378,600	$1,844,650	$9,223,250	25.0%
Geomorphic Restructing	$380,000	$95,000	$475,000	25.0%
Island Near Rathbum	$14,669,736	$3,667,434	$18,337,170	25.0%
Island Near Metcalf	$9,495,710	$2,373,928	$11,869,638	25.0%
Tributary Measures	$6,309,205	$1,577,301	$7,886,506	25.0%
Planting Measures				
Invasives	$2,409,369	$602,342	$3,011,711	25.0%
Vegetation Type	$26,308,750	$6,577,188	$32,885,938	25.0%
Total Estimated Construction Cost	**$88,350,143**	**$22,087,536**	**$110,437,679**	25.0%
Adaptive Management (3% of Construction Cost)	$3,313,130		$3,313,130	3.0%
Planning, Engineering and Design (PED), 10%	$11,043,768		$11,043,768	10.0%
Construction Management (S&A), 6.7%	$7,399,325		$7,399,325	6.7%
Engineering During Construction (EDC), 1.5%	$1,656,565		$1,656,565	1.5%
Total Project Cost	**$111,762,931**	**$22,087,536**	**$133,850,467**	
Total Project Cost (Including Real Estate and O&M)	**$140,658,747**	**$22,087,536**	**$162,746,283**	

Table 4: Alternative 3 - Average Annual Cost

Big Bear Lake Alternative 3 - Comprehensive B	
Incremental Gains Beyond NO ACTION (AAHU)	1775.41
Total Project Construction Cost (First Costs)	$162,746,283
Interest During Construction	$10,605,894
Total Gross Investment	$173,352,177
Present Value of O&M over the life of the project	$32,027,111
Total Costs	**$205,379,288**
Annual Cost of Total Gross Investment	$8,594,309
Annual Cost of O&M	$1,587,813
Total Annual Costs	$10,182,123
Average Annual Cost Per AAHUs	**$5,735.08**

Alternative 4 – Lake Restoration

This Alternative focuses on in-lake restoration. The alternative assumes that restoration of marsh and meadow at the fluctuating lake edge will further meet objectives for both lake and riparian restoration.

Table 5: Big Bear Lake Ecosystem Restoration - Cost Estimates on Lake Restoration

PROJECT: Big Bear Lake Ecosystem Restoration - Cost Estimates on Lake Restoration Alternative (4)

DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	CONTINGENCY PERCENT
Real Estate	**$8,523,937**		**$8,523,937**	0.0%
Lake & Shoreline Measures				
Dredging within the Lake	$4,224,448	$1,056,112	$5,280,560	25.0%
Alum Treatment of Entire Lake	$10,000,000	$2,500,000	$12,500,000	25.0%
Fisheries Restoration	$2,000,000	$500,000	$2,500,000	25.0%
Install Solar Powered Water Pumps to Recyle Water	$5,174,325	$1,293,581	$6,467,906	25.0%
Stanfield Marsh Restoration	$385,000	$96,250	$481,250	25.0%
Geomorphic Restructing	$202,500	$50,625	$253,125	25.0%
Tributary Measures	$0	$0	$0	
Planting Measures				
Invasives	$2,409,369	$602,342	$3,011,711	25.0%
Vegetation Type	$17,179,070	$4,294,768	$21,473,838	25.0%
Total Estimated Construction Cost	**$41,574,712**	**$10,393,678**	**$51,968,390**	25.0%
Adaptive Management (3% of Construction Cost)	$1,559,052		$1,559,052	3.0%
Planning, Engineering and Design (PED), 10%	$5,196,839		$5,196,839	10.0%
Construction Management (S&A), 6.7%	$3,481,882		$3,481,882	6.7%
Engineering During Construction (EDC), 1.5%	$779,526		$779,526	1.5%
Total Project Cost	**$52,592,011**	**$10,393,678**	**$62,985,689**	
Total Project Cost (Including Real Estate)	**$61,115,948**	**$10,393,678**	**$71,509,626**	

Table 6: Alternative 4 – Average Annual Cost

Big Bear Lake Alternative 4 - Lake	
Incremental Gains Beyond NO ACTION (AAHU)	1732.68
Total Project Construction Cost (First Costs)	$71,509,626
Interest During Construction	$4,660,159
Total Gross Investment	$76,169,784
Present Value of O&M over the life of the project	$21,451,440
Total Costs	**$97,621,224**
Annual Cost of Total Gross Investment	$3,776,282
Annual Cost of O&M	$1,063,502
Total Annual Costs	$4,839,783
Average Annual Cost Per AAHUs	**$2,793.24**

Alternative 5 – Lake and Shoreline Restoration

This alternative focuses on restoration of the lake and surrounding shoreline. This alternative includes all the measures in the Lake Restoration Alternative except that restoration of Stanfield Marsh will use reclaimed water piped in from the wastewater treatment plant and pumps and pipelines.

Table 7: Big Bear Lake Ecosystem Restoration - Cost Estimates on Lake and Shoreline Restoration

PROJECT: Big Bear Lake Ecosystem Restoration - Cost Estimates on Lake and Shoreline Restoration Alternative (5)				
DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY	CONTINGENCY PERCENT
Real Estate	**$12,219,038**		**$12,219,038**	0.0%
Lake & Shoreline Measures				
Dredging within the Lake	$4,224,448	$1,056,112	$5,280,560	25.0%
Alum Treatment of Entire Lake	$10,000,000	$2,500,000	$12,500,000	25.0%
Fisheries Restoration	$2,000,000	$500,000	$2,500,000	25.0%
Stanfield Marsh Restoration	$385,000	$96,250	$481,250	25.0%
Geomorphic Restructing	$380,000	$95,000	$475,000	25.0%
Island Near Rathbum	$14,669,736	$3,667,434	$18,337,170	25.0%
Island Near Metcalf	$9,495,710	$2,373,928	$11,869,638	25.0%
Tributary Measures	$0	$0	$0	
Planting Measures				
Invasives	$2,409,369	$602,342	$3,011,711	25.0%
Vegetation Type	$23,720,510	$5,930,128	$29,650,638	25.0%
Total Estimated Construction Cost	**$67,284,773**	**$16,821,193**	**$84,105,966**	25.0%
Adaptive Management (3% of Construction Cost)	$2,523,179		$2,523,179	3.0%
Planning, Engineering and Design (PED), 10%	$8,410,597		$8,410,597	10.0%
Construction Management (S&A), 6.7%	$5,635,100		$5,635,100	6.7%
Engineering During Construction (EDC), 1.5%	$1,261,589		$1,261,589	1.5%
Total Project Cost	**$85,115,238**	**$16,821,193**	**$101,936,431**	
Total Project Cost (Including Real Estate)	**$97,334,276**	**$16,821,193**	**$114,155,469**	

Table 8: Alternative 5 - Average Annual Cost

Big Bear Lake Alternative 5 - Lake and Shoreline	
Incremental Gains Beyond NO ACTION (AAHU)	1758.71
Total Project Construction Cost (First Costs)	$114,155,469
Interest During Construction	$7,439,314
Total Gross Investment	$121,594,783
Present Value of O&M over the life of the project	$26,827,622
Total Costs	**$148,422,405**
Annual Cost of Total Gross Investment	$6,028,325
Annual Cost of O&M	$1,330,037
Total Annual Costs	$7,358,362
Average Annual Cost Per AAHUs	**$4,183.95**

Table 25: Big Bear Lake Alternative Summary of Costs and HUs

Big Bear Lake Alternative Summary - Costs and HUs								
Description	Total Acres	Initial Uplift (HUs)	Secondary Uplift (HUs)	Total Incremental HUs	Total Costs	Total Annual Costs	Cost per HU based on Total Cost	Cost per HU based on Total Annual Costs
Alternative 2 - Comprehensive A	3083.48	413.8	109.8	523.53	$96,544,300	$4,786,400	$184,400	$9,140
Alternative 3 - Comprehensive B	3102.89	1570.1	205.3	1775.41	$205,379,300	$10,182,100	$115,700	$5,740
Alternative 4 - Lake	2871.30	1518.8	213.9	1732.68	$97,621,200	$4,839,800	$56,300	$2,790
Alternative 5 - Lake and Shoreline	3029.74	1554.3	204.4	1758.71	$148,422,400	$7,358,400	$84,400	$4,180
Alternative 6 - Lake and Marsh	1273.96	165.5	105.1	270.57	$121,836,100	$6,040,300	$450,300	$22,320
Alternative 7 - Lake and Meadow	1141.80	95.1	100.1	195.20	$98,604,600	$4,888,500	$505,100	$25,040
Alternative 8 - Lake and Riparian	2824.25	1496.6	196.0	1692.55	$158,032,500	$7,834,800	$93,400	$4,630
Alternative 9 - Shoreline	583.73	78.7	5.3	84.01	$97,332,900	$4,825,500	$1,158,600	$57,440
Alternative 10 - Meadow and Lake	1177.83	74.3	107.7	182.03	$90,087,100	$4,466,300	$494,900	$24,540
Alternative 11 - Meadow and Riparian	328.36	40.2	0.0	40.20	$61,410,200	$3,044,500	$1,527,600	$75,730
Alternative 12 - Aquatic Planting	486.28	66.5	5.3	71.84	$40,258,600	$1,995,900	$560,400	$27,780
Alternative 13 - Invasives Removal	678.09	89.4	0.0	89.44	$69,774,000	$3,459,200	$780,100	$38,680

Table 26: Big Bear Lake Alternatives - Cost Effective and Best Buy Analysis

Big Bear Lake Alternatives - Cost Effective & Best Buy Analysis

Description	Total Annual Cost	Total Incremental HUs	Cost Effective
Alternative 1 - No Action	$0	0.00	Best Buy
Alternative 11 - Meadow and Riparian	$3,044,500	40.20	No
Alternative 12 - Aquatic Planting	$1,995,900	71.84	Yes
Alternative 9 - Shoreline	$4,825,500	84.01	No
Alternative 13 - Invasives Removal	$3,459,200	89.44	Yes
Alternative 10 - Meadow and Lake	$4,466,300	182.03	Yes
Alternative 7 - Lake and Meadow	$4,888,500	195.20	No
Alternative 6 - Lake and Marsh	$6,040,300	270.57	No
Alternative 2 - Comprehensive A	$4,786,400	523.53	Yes
Alternative 8 - Lake and Riparian	$7,834,800	1692.55	No
Alternative 4 - Lake	$4,839,800	1732.68	Best Buy
Alternative 5 - Lake and Shoreline	$7,358,400	1758.71	Best Buy
Alternative 3 - Comprehensive B	$10,182,100	1775.41	Best Buy

The next figure is a graph from the IWR Plan program which depicts the alternatives differentiated by cost effectiveness.

Table 27: Big Bear Lake Alternatives - Incremental Cost by HUs

Big Bear Lake Alternatives - Incremental Cost of Best Buy Plan Combinations Ordered by HUs

Description	Order by Incremental Cost of Best Buy Plan	Total Annual Cost	Total Incremental HUs	Average Annual Cost Per HU	Incremental Cost	Incremental HU	Incremental Cost per HU
Alternative 1 - No Action	1	$0	0.00				
Alternative 4 - Lake	2	$4,839,800	1732.68	$2,790	$4,839,800	1732.68	$2,790
Alternative 5 - Lake and Shoreline	3	$7,358,400	1758.71	$4,180	$2,518,600	26.03	$96,760
Alternative 3 - Comprehensive B	4	$10,182,100	1775.41	$5,740	$2,823,800	16.70	$169,090

BIG BEAR LAKE ECOSYSTEM RESTORATION

Primary Objectives

To restore Big Bear Lake and Shoreline including degraded Tributaries as needed to restore Lake and Shoreline Habitat.

Big Bear Valley, prior to the raising of the dam, was home to a diverse ecosystem dependent upon a 500 to 1000 acre semi perennial lake surrounded by 6000 acres of marsh and meadows. In 1884 the valley was dammed and today the reservoir serves as the economic base of for the Big Bear resort community. Water demands range from local needs, downstream water supply for residential uses to lakeside and downstream Bear Creek habitat.

Taking a watershed approach, this study seeks to formulate and evaluate alternatives for restoring the Lake and adjacent areas of the Valley, and to improve the health of the lake while supporting both the community and surrounding habitat. While some measures proposed are not within the authority of the sponsor, BBMWD, or the Corps of Engineers to implement, it is hoped that other agencies and governments in the Valley will participate in their implementation to improve the health of the lake, shoreline, and degraded tributaries in the watershed.

Proposed project alternatives are described below, encompassing a variety of measures to improve the lake, shoreline marshes and meadows, and degraded habitat along selected lake tributaries. For each alternative, Best Management Practices" (BMPs) and public education measures have also been identified and evaluated, to include:

- Guidelines for keeping marinas clean and free of invasive macrophytes, to include such measures as boat washing prior to lake entry.
- Shoreline and park signage, newsletters, public education on ecosystems and historic habitats, kiosks in parks, and shoreline landscaping guides,
- Economic incentives for developers:
    - Permit requirements.
    - Tax credits or property tax relief.
    - Funding support (state/Fed grants).
- BMPs for sediment management.
- Mitigation for development, as follows, with built-in tax breaks :
    - Meadow protection and restoration,
    - Creation of marsh habitat along tributaries and shoreline,
    - Recreation trails to direct pedestrian traffic away from restored areas,
    - Restoration of native riparian areas
- Zoning regulations to set aside land for open space, and/or to designate setbacks,
- Economic and other incentives for landowners to support environmental and open space values.
- Further reduction of wave action to prevent shoreline erosion.

Fourteen alternatives were originally developed, with a total of seventy variations. As these alternatives and their variations were screened, measures were eliminated that did not meet project objectives and/or were less effective than others proposed. These alternatives were then screened based on pairwise comparison, weighting of objectives, and the effectiveness of each measure in meeting those objectives. Weighting of objectives was accomplished by Project Delivery Team (PDT) members, including the Corps, Sponsor, USFWS, FS, CF&G, NRCS, and the RCWQB. Alternatives that were not significantly different from similar alternatives were also eliminated by the PDT.

The remaining, still preliminary, array of alternatives addresses objectives to restore the ecosystem in the lake and, to varying degrees, related shoreline and tributary habitats. While similar in many respects, individual alternatives focus on different landscape locales and, or, restoration measures. The names of the alternatives are intended to reflect their relative focus, with the first word representing their primary focus (e.g. lake), and the second their secondary focus (e.g. meadow). Riparian may refer to one or more of several montane riparian habitat communities, to include Montane Riparian, Wet or Dry Montane Meadow, or Montane Marsh. If Marsh or Meadow is named, it is because that specific riparian community is the focus of the alternative as opposed to other riparian communities. All restoration areas are supported with water harvesting, grading and excavation as needed for sustainability. The comprehensive alternatives, in turn, subsume different combinations of multiple measures in multiple habitat types. The alternative names are:

Lake – Alt. 4
Lake and Shoreline – Alt. 5
Lake and Marsh
Lake and Meadow
Lake and Riparian
Shoreline
Meadow and Lake
Meadow and Riparian
Aquatic Plant Restoration
Invasive Removal and Restoration
Comprehensive Alternative A – Alt. 2
Comprehensive Alternative B – Alt. 3

Alt. #2 **COMPREHENSIVE ALTERNATIVE A**

This alternative includes most proposed restoration measures to restore the lake and surrounding riparian and marsh/meadows. Riparian and marsh/meadow areas on tributaries that have negatively affected lake health are also restored. Structural management measures such as sediment basins are not included.

The following measures form this alternative:

Lake Restoration

- Eradicate invasive aquatic vegetation, and following eradication treatment, plant native aquatic and depth-tolerant vegetation in deeper locations (in the littoral zone).
- Improve aquatic plant habitat in littoral zone
- Fisheries Restoration:
    - Remove non-native, nuisance species of fish by netting, electro-fishing and carp round-up.
- Marsh/Meadow Restoration
    - Install pump in the East End Deepening Project area of the lake with pipeline conveying water to recirculate water through Stanfield Marsh. This water resource will keep marsh wet all year. Water will flow through a braided system developed by micro-grading back through the porous Stanfield Crossing toward the west into the lake. This will allow wet meadow and marsh habitat to develop along wetted areas as lake levels rise and fall with varying weather conditions.
    - Construct low lying islands from dredge material, planted with riparian, marsh and meadow vegetation to restore habitat for migratory birds and waterfowl in Metcalf Bay and near the mouth of Rathbun Creek. Island design would include a moat to lengthen the time the island base is protected from predators and surrounded by deep water as lake levels fluctuate. Dredge material from terracing would be used for island construction.
    - Terracing or geomorphic restructuring of the shoreline within the fluctuating area primarily along the northern edges of the lake –so that as the water level changes, the plant community would change from aquatic to marsh to meadow on terraces. To establish this community, we would include bed treatments and planting to establish seed beds, and a diverse native aquatic plant community appropriate for migratory birds, fish, native amphibians, and migratory waterfowl habitat.
    - Restore marsh/meadow at mouth of Metcalf Creek and along Metcalf Bay
    - Restore and reintroduce native plants and remove invasives in existing riparian scrub, marsh, and meadow in Grout Bay.

Shoreline Restoration

- Meadows:
    - Remove invasives and replant native vegetation.

    - Restore and reintroduce native plants in areas along the shoreline where meadows once existed.
    - Improve areas with existing meadows and at mouths of creeks.
- Marsh:
    - Increase meadow/marsh areas along shoreline – grade from emergent to meadow grasses.
    - Dredge shallow shoreline areas creating a terrace to restore shoreline marsh at public access points.
- Montane Riparian:
    - Improve shoreline riparian areas and restore with native riparian scrub plantings along public shoreline and as riparian buffer zones of 15 to 100 meters along restored marsh/meadow areas.

Marsh/Meadow and Riparian Restoration on Tributaries

- Add riparian buffer zones from 15 meters to 100 meters widths along restored marsh meadow areas of tributaries where possible.
- Restore and reintroduce native plants and remove invasives in existing riparian scrub, marsh, and meadow.
- Restore marsh/meadow areas at existing stream meanders on the inside of bends along the lower creek.
- Stabilize steam banks with riparian vegetation.
- Restore wet meadows in ski area.
- On Knickerbocker Creek restore riparian strand in areas upstream.

Cost Effective Alt. #2

Big Bear Lake Ecosystem Restoration - Engineer's Estimate on Alternative A - 2010 PRICE LEVEL

Code of Acc.		DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST WITHOUT CONTING	CONTING	COST WITH CONTING	CONTG %
01	**REAL ESTATE**								
	01	Government Lands	1	LS	$2,801,419	$2,801,419		$2,801,419	0%
	02	Private Lands	1	LS	$26,053,983	$26,053,983		$26,053,983	0%
		Total Real Estate Cost			$28,855,402	$28,855,402		$28,855,402	
06.	**LAKE & SHORELINE MEASURES**								
	1	**Stanfield Marsh Restoration**							
		Grading in Stanfield Marsh to use reclaimed water effectively (Water supplied by Water Treatment Plant)	154	ACR	$2,500	$385,000	$96,250	$481,250	25%
		Total Lake and Shoreline Measures				$385,000	$96,250	$481,250	
09.	**TRIBUTARY MEASURES**								
	1	**Grading at Knickerbocker, Rathbun, Metcalf, and Summit for Vegetation Planting**							
		Terracing to encourage marsh development	162	ACR	$24,300	$3,936,600	$984,150	$4,920,750	25%
		Grading planting areas	407	ACR	$2,500	$1,017,775	$254,444	$1,272,219	25%
		Total Tributary Measures				$4,954,375	$1,238,594	$6,192,969	
09.	**PLANTING MEASURES**								
	1	**Invasives**							
		Eradicate aquatic invasives	1	LS	$1,153,369	$1,153,369	$288,342	$1,441,711	25%
		Remove shoreline & tributary invasive plants (391 acres, assume 40% invaded)	157	ACR	$8,000	$1,256,000	$314,000	$1,570,000	25%
	2	**Vegetation Types**							
		Aquatic Communities	717	ACR	$15,000	$10,760,250	$2,690,063	$13,450,313	25%
		Marsh Communities	226	ACR	$15,000	$3,387,600	$846,900	$4,234,500	25%
		Riparian Communities	62	ACR	$36,000	$2,228,400	$557,100	$2,785,500	25%
		Meadow Communities	112	ACR	$40,000	$4,462,400	$1,115,600	$5,578,000	25%
		Marsh/Meadow Communities	81	ACR	$35,000	$2,826,600	$706,650	$3,533,250	25%
		Meadow/Riparian Communities	34	ACR	$40,000	$1,354,400	$338,600	$1,693,000	25%
		Total Planting Measures				$27,429,019	$6,857,255	$34,286,273	
		Construction Cost				$32,768,394	$8,192,098	$40,960,492	
		Adaptive Management (3% of Construction Cost)				$1,228,815		$1,228,815	
30.		**Planning, Engineering and Design (PED), 10%**				$4,096,049		$4,096,049	
31.		**Construction Management (S&A), 6.7%**				$2,744,353		$2,744,353	
		Engineering During Construction (EDC), 1.5%				$614,487		$614,487	
		Total Project Cost				$41,452,018	$8,192,098	$49,644,117	
		O & M costs							
		O & M Costs (annual costs over life of project)				$408,838			
		TOTAL PROJECT COST FOR ALTERNATIVE A (Including Real Estate)				$70,307,420	$8,192,098	$78,499,518	
		USFS LAND RESTORATION							
		Real estate impact							
		Planting							
		Geomorphic Restructuring							
		Subtotal Federal Non-Corps (USFS) Costs							

Alt. #3

COMPREHENSIVE ALTERNATIVE B

This alternative includes all proposed restoration measures in Comprehensive Alternative A. In contrast to Comprehensive Alternative A, the alternative includes alum treatment of the lakebed, pumping upstream from the lake on tributaries for spawning of fish, dredge capping of high nutrient areas in the lake, dredging of shoreline within the lake, and dredging of Knickerbocker Creek at the tributary mouth. It also includes sediment basins and improvement of sediment traps at the ski overflow parking area on Rathbun Creek.

This alternative includes the following additional measures:

Lake Restoration

- Restore aquatic vegetation:
  - Plant appropriate native aquatics remaining littoral zone.
  - Plant emergent marsh/meadow along shoreline edge
- Improved shallow areas will be configured and seeded to encourage development of aquatic and marsh habitats. Deep water habitat is expected to develop where dredging deepens shallow areas.
- Alum treatment to establish a physical barrier between nutrient rich sediments and the water column (entire Lake).
- Placement of a soil cap in the lakebed over areas of high nutrient concentration along with suction dredging of top layer of high nutrient concentration.
- Install water pump to recycle lake water to provide fish spawning habitat at Grout and Metcalf Creeks a short distance upstream. Pump only during spawning season for trout and bass.
- Create rocky, gravely creek bottoms for spawning beds in Grout & Metcalf.

Shoreline Restoration

- Dredge lake shoreline & creek mouths to provide wetted area for emergent shoreline marsh areas

Marsh/Meadow and Riparian Restoration on Tributaries

- Rathbun Creek:
  - Improve sediment traps on Rathbun Creek at ski parking lot. Traps need to be improved to allow some pass through of fines, yet control excessive sedimentation that would damage riparian and marsh/meadow areas downstream.
  - New sediment catchment basins located upstream on Rathbun in Sand Canyon and at Bear Mountain.
- Knickerbocker Creek
  - New sediment catchment basin above urbanized area with meandering stream lined with riparian vegetation.

Best Buy
Alt. #3

Big Bear Lake Ecosystem Restoration - Engineer's Estimate on Alternative B - 2010 PRICE LEVEL

Code of Acc.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST WITHOUT CONTING	CONTING	COST WITH CONTING	CONTG %
01	**REAL ESTATE**							
01	Government Lands	1	LS	$26,087,397	$26,087,397		$26,087,397	0%
02	Private Lands	1	LS	$2,808,419	$2,808,419		$2,808,419	
	Total Real Estate Cost			$2,808,419	$28,895,816		$28,895,816	
06.	**LAKE & SHORELINE MEASURES**							
1	**Dredging within the Lake**							
	Mob and Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
	Dredge material and pump to cap over high-nutrient areas (within 188 acre center)	323,865	CY	$11.50	$3,724,448	$931,112	$4,655,559	25%
2	**Alum treatment of entire lake (3000 acres)**	1	LS	$10,000,000	$10,000,000	$2,500,000	$12,500,000	25%
3	**Fisheries Restoration**							
	Remove non-native, nuisance species of fish	1	LS	$2,000,000	$2,000,000	$500,000	$2,500,000	25%
4	**Install solar powered water pumps to recycle lake water for spawning**							
	Install pump station and pipelines at Grout Creek	1	LS	$3,132,950	$3,132,950	$783,238	$3,916,188	25%
	Install pump station and pipelines at Metcalf Creek	1	LS	$1,989,775	$1,989,775	$497,444	$2,487,219	25%
	Gravely stream bottom in both creeks	1	LS	$51,600	$51,600	$12,900	$64,500	25%
5	**Stanfield Marsh Restoration**							
	Grading in Stanfield Marsh to use pumped water effectively	154	ACR	$2,500	$385,000	$96,250	$481,250	25%
	Install pump station and pipelines - Multiple Outlets Option	1	LS	$6,993,600	$6,993,600	$1,748,400	$8,742,000	25%
6	**Geomorphic Restructuring**							
	Grading in Meadow	81	ACR	$2,500	$202,500	$50,625	$253,125	25%
	Terrace or geomorphic restructuring of shoreline	71	ACR	$2,500	$177,500	$44,375	$221,875	25%
7	**Island near Rathbun**							
	Sheetpile (16' to 19' deep @ PZ40 lb/sf)	1,910	ton	$4,500	$8,595,000	$2,148,750	$10,743,750	25%
	Mob/Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
	Remove existing weaker base soil to affirm structure	41,000	CY	$8.00	$328,000	$82,000	$410,000	25%
	Dredge Material	284,592	CY	$8.00	$2,276,736	$569,184	$2,845,920	25%
	Rock Habitat - Placement	99,000	ton	$30.00	$2,970,000	$742,500	$3,712,500	25%
8	**Island near Metcalf**							
	Sheetpile (16' to 19' deep @ PZ40 lb/sf)	1,191	ton	$4,500	$5,359,500	$1,339,875	$6,699,375	25%
	Mob/Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
	Remove weaker soil to affirm structure	27,100	CY	$7.50	$203,250	$50,813	$254,063	25%
	Dredge Material	189,728	CY	$7.50	$1,422,960	$355,740	$1,778,700	25%
	Rock Habitat - Placement	67,000	ton	$30.00	$2,010,000	$502,500	$2,512,500	25%
	Total Lake and Shoreline Measures				$53,322,819	$13,330,705	$66,653,523	
09.	**TRIBUTARY MEASURES**							
1	**Knickerbocker Creek: Water Infiltration / Sediment Basin**							
	Excavation	5,600	CY	$14	$78,400	$19,600	$98,000	25%
	24" RCP (Exc, lay pipe, bedding, backfill)	770	LF	$170	$130,900	$32,725	$163,625	25%
	12' High Gravity Wall (Conrt, forms, reinfr and finish)	240	CY	$260	$62,400	$15,600	$78,000	25%
2	**Rathbun Creek:**							
	1' High Stone Berms (2 ea) and 24" riprap slope	1,616	TON	$50	$80,800	$20,200	$101,000	25%
	Excavation	50,855	CY	$14	$711,970	$177,993	$889,963	25%
	24" RCP (Exc, lay pipe, bedding, backfill)	790	LF	$170	$134,300	$33,575	$167,875	25%
	10' High Outlet Wall (Conrt, forms, reinfr and finish)	459	CY	$340	$156,060	$39,015	$195,075	25%
3	**Grading at Knickerbocker, Rathbun, Metcalf, and Summit for Vegetation Planting**							
	Terracing to encourage marsh development	162	ACR	$24,300	$3,936,600	$984,150	$4,920,750	25%
	Grading planting areas	407	ACR	$2,500	$1,017,775	$254,444	$1,272,219	25%
	Total Tributary Measures				$6,309,205	$1,577,301	$7,886,506	
09.	**PLANTING MEASURES**							
1	**Invasives**							
	Eradicate aquatic invasives	1	LS	$1,153,389	$1,153,389	$288,342	$1,441,711	25%
	Remove shoreline & tributary invasive plants (391 acres, assume 40% invaded)	157	ACR	$8,000	$1,256,000	$314,000	$1,570,000	25%
2	**Vegetation Types**							
	Aquatic Communities	705	ACR	$15,000	$10,580,550	$2,645,138	$13,225,688	25%
	Marsh Communities	235	ACR	$15,000	$3,523,050	$880,763	$4,403,813	25%
	Riparian Communities	84	ACR	$36,000	$3,009,600	$752,400	$3,762,000	25%
	Meadow Communities	113	ACR	$40,000	$4,502,800	$1,125,700	$5,628,500	25%
	Marsh/Meadow Communities	95	ACR	$35,000	$3,340,750	$835,188	$4,175,938	25%
	Meadow/Riparian Communities	34	ACR	$40,000	$1,352,000	$338,000	$1,690,000	25%
	Total Planting Measures				$28,718,119	$7,179,530	$35,897,648	
				Construction Cost	$88,350,142	$22,087,536	$110,437,678	
				Adaptive Management (3% of Construction Cost)	$3,313,130		$3,313,130	
30.				**Planning, Engineering and Design (PED), 10%**	$11,043,768		$11,043,768	
31.				**Construction Management (S&A), 6.7%**	$7,399,324		$7,399,324	
				Engineering During Construction (EDC), 1.5%	$1,656,565		$1,656,565	
				Total Project Cost	$111,762,930	$22,087,536	$133,850,466	
	O & M costs							
	Alum Treatment repeated every 10 years							
	O & M Costs (annual costs over life of project).				$1,325,251			
	TOTAL PROJECT COST FOR ALTERNATIVE A (Including Real Estate)				$140,658,746	$22,087,536	$162,746,282	
	USFS LAND RESTORATION							
	Real estate impact							
	Planting							
	Geomorphic Restructuring							
	Subtotal Federal Non-Corps (USFS) Costs							

PRELIMINARY ALTERNATIVES DESCRIPTION

Alt. #4 LAKE RESTORATION ALTERNATIVE

This Alternative focuses on in-lake restoration including dredging to enhance habitat, eradication of non-native aquatics, re-establishment of native aquatic vegetation, and includes a pump and pipeline to keep the Stanfield Marsh wetted year round to meet objectives for riparian and marsh/meadow restoration. Alum treatment to establish a physical barrier between nutrient rich sediments and the water column over the entire lakebed will improve water quality for aquatic plants and fish. The alternative assumes that restoration of marsh and meadow at the fluctuating lake edge will further meet objectives for riparian restoration. The alternative includes balancing of fisheries for a diverse and healthy aquatic plant community, along with support of spawning areas which will be kept wet during spawning season on Grout and Metcalf Creeks using a pump system.

The following measures form this alternative:

Lake Restoration

- Eradicate invasive aquatic vegetation, and following eradication treatment, plant aquatic and depth-tolerant vegetation in deeper locations (in the littoral zone).
- Dredging will be used for restoration as follows:
    - Terracing or regrading to create a geomorphic surface at levels within the fluctuating area–so that as the water level changes, the plant community would change from aquatic to marsh to meadow in terraced or graded areas. To establish this community, we would include bed treatments and planting to establish seed beds, and a diverse native aquatic plant community appropriate for birds, fish, and wildlife. As areas are dredged there will be an increase deeper water habitat and marsh around the lake edge.
    - Place a soil cap from low-nutrient lake dredge material in the lakebed over areas of high nutrient concentration.
    - Construct low lying islands from dredge material, planted with riparian, marsh and meadow vegetation to restore habitat for migratory birds and waterfowl in Metcalf Bay and near the mouth of Rathbun Creek. Island design would include a moat to lengthen the time the island base is wetted, protected and surrounded by water as lake levels fluctuate.
- Fisheries Restoration:
    - Improve aquatic plant habitat in shallow areas.
    - Remove non-native, nuisance species of fish by netting, electro-fishing and carp round-up.
- Alum treatment to establish a physical barrier between nutrient rich sediments and the water column (entire Lake).
- Install solar powered water pump to recycle lake water to provide fish spawning habitat at Grout and Metcalf Creeks a short distance upstream. Pump only during spawning season for trout and bass. Create rocky, gravely creek bottoms for spawning beds.

- Lake Marsh/Meadow Restoration
    - Install pump in the East End Deepening Project area of the lake with pipeline conveying water to recirculate water through Stanfield Marsh. This water resource will keep marsh wetter during dry periods. Water will flow through a braided system developed by micro-grading back through the porous Stanfield Crossing toward the west into the lake. This will allow wet meadow and marsh habitat to develop along wetted areas as lake levels rise and fall with varying weather conditions.

Best Buy
Alt. #4

Big Bear Lake Ecosystem Restoration - Engineer's Estimate on Lake Restoration Alternative

Code of Acc.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST WITHOUT CONTING	CONTING	COST WITH CONTING	CONTG %
01	**REAL ESTATE**							
01	Government Lands	1	LS	$1,638,747	$1,638,747		$1,638,747	0%
02	Private Lands	1	LS	$6,885,190	$6,885,190		$6,885,190	0%
	Total Real Estate Cost				$8,523,937	$8,523,937		
06.	**LAKE & SHORELINE MEASURES**							
1	**Dredging within the Lake**							
	Mob and Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
	Dredge material and pump to cap over high-nutrient areas (within 188 acre center)	323,885	CY	$11.50	$3,724,448	$931,112	$4,655,559	25%
2	**Alum treatment of entire lake (3000 acres)**	1	LS	$10,000,000	$10,000,000	$2,500,000	$12,500,000	25%
3	**Fisheries Restoration**							
	Remove non-native, nuisance species of fish	1	LS	$2,000,000	$2,000,000	$500,000	$2,500,000	25%
4	**Install solar powered water pumps to recycle lake water for spawning**							
	Install pump station and pipelines at Grout Creek	1	LS	$3,132,950	$3,132,950	$783,238	$3,916,188	25%
	Install pump station and pipelines at Metcalf Creek	1	LS	$1,989,775	$1,989,775	$497,444	$2,487,219	25%
	Gravely stream bottom in both creeks	1	LS	$51,600	$51,600	$12,900	$64,500	25%
5	**Stanfield Marsh Restoration**							
	Grading in Stanfield Marsh to use pumped water effectively (Water supplied by Water Treatment Plant)	154	ACR	$2,500	$385,000	$96,250	$481,250	25%
6	**Geomorphic Restructuring**							
	Grading in Meadow	81	ACR	$2,500	$202,500	$50,625	$253,125	25%
	Total Lake and Shoreline Measures				$21,986,273	$5,496,568	$27,482,841	
09.	**PLANTING MEASURES**							
1	**Invasives**							
	Eradicate aquatic invasives	1	LS	$1,153,369	$1,153,369	$288,342	$1,441,711	25%
	Remove shoreline & tributary invasive plants (391 acres, assume 40% invaded)	157	ACR	$8,000	$1,256,000	$314,000	$1,570,000	25%
2	**Vegetation Types**							
	Aquatic Communities	720	ACR	$15,000	$10,803,000	$2,700,750	$13,503,750	25%
	Marsh Communities	230	ACR	$15,000	$3,445,350	$861,338	$4,306,688	25%
	Riparian Communities	3	ACR	$36,000	$106,920	$26,730	$133,650	25%
	Marsh/Meadow Communities	81	ACR	$35,000	$2,823,800	$705,950	$3,529,750	25%
	Total Planting Measures				$19,588,439	$4,897,110	$24,485,548	
	Construction Cost				$50,098,648	$10,393,678	$60,492,326	
30.	**Adaptive Management (3% of Construction Cost)**				$1,814,770		$1,814,770	
31.	**Planning, Engineering and Design (PED), 10%**				$6,049,233		$6,049,233	
	Construction Management (S&A), 6.7%				$4,052,986		$4,052,986	
	Engineering During Construction (EDC), 1.5%				$907,385		$907,385	
	Total Project Cost				$62,923,021	$10,393,678	$73,316,699	
	O & M Costs (annual costs over life of project).				$988,160			
	TOTAL PROJECT COST FOR ALTERNATIVE A (including Real Estate)				$71,446,958	$10,393,678	$81,840,636	
	USFS LAND RESTORATION							
	Real estate impact							
	Planting							
	Geomorphic Restructuring							
	Subtotal Federal Non-Corps (USFS) Costs							

LAKE AND SHORELINE RESTORATION ALTERNATIVE

This alternative focuses on restoration of the lake and surrounding shoreline. It includes eradication of invasives and restoration of native aquatic and riparian plants as well as improvement of the Stanfield Marsh habitat. It reconfigures the lake edge to encourage establishment of marsh/meadow/riparian vegetation as the lake levels fluctuate. Fisheries are balanced between warm and cold-water habitat and restored aquatic vegetation. High nutrient areas of the lake are capped and spawning areas for trout and bass are supported by pumping water upstream during spawning season.

This alternative includes all the measures in the Lake Restoration Alternative and adds the following:

Shoreline Restoration

- Meadows:
  - Remove invasives and replant native vegetation.
  - Restore and reintroduce native plants in areas along the shoreline where meadows once existed.
  - Improve areas with existing meadows and at mouths of creeks.
- Marsh:
  - Increase meadow/marsh areas along shoreline
  - Dredge shallow shoreline areas creating a terrace to restore shoreline marsh at public access points.
- Montane Riparian:
  - Shoreline revegetation - native plantings along public shoreline –from emergent to grasses to riparian scrub.

Best Buy
Alt. 5

Big Bear Lake Ecosystem Restoration - Engineer's Estimate on Lake & Shoreline Restoration Alternative

Code of Acc.		DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST WITHOUT CONTING	CONTING	COST WITH CONTING	CONTG %
01		**REAL ESTATE**							
	01	Government Lands	1	LS	$1,814,975	$1,814,975		$1,814,975	0%
	02	Private Lands	1	LS	$10,404,063	$10,404,063		$10,404,063	0%
		Total Real Estate Cost			$12,219,038	$12,219,038		$12,219,038	
06.		**LAKE & SHORELINE MEASURES**							
	1	**Dredging within the Lake**							
		Mob and Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
		Dredge material and pump to cap over high-nutrient areas (within 188 acre center)	323,865	CY	$11.50	$3,724,448	$931,112	$4,655,559	25%
	2	**Alum treatment of entire lake (3000 acres)**	1	LS	$10,000,000	$10,000,000	$2,500,000	$12,500,000	25%
	3	**Fisheries Restoration**							
		Remove non-native, nuisance species of fish	1	LS	$2,000,000	$2,000,000	$500,000	$2,500,000	25%
	4	**Stanfield Marsh Restoration**							
		Grading in Stanfield Marsh to use pumped water effectively (Water supplied by Water Treatment Plant)	154	ACR	$2,500	$385,000	$96,250	$481,250	25%
	5	**Geomorphic Restructuring**							
		Grading in Meadow	81	ACR	$2,500	$202,500	$50,625	$253,125	25%
		Terrace or geomorphic restructuring of shoreline	71	ACR	$2,500	$177,500	$44,375	$221,875	25%
	6	**Island near Rathbun**							
		Sheetpile (16' to 19' deep @ PZ40 lb/sf)	1,910	ton	$4,500	$8,595,000	$2,148,750	$10,743,750	25%
		Mob/Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
		Remove existing weaker base soil to affirm structure	41,000	CY	$8.00	$328,000	$82,000	$410,000	25%
		Dredge Material	284,592	CY	$8.00	$2,276,736	$569,184	$2,845,920	25%
		Rock Habitat - Placement	99,000	ton	$30.00	$2,970,000	$742,500	$3,712,500	25%
	7	**Island near Metcalf**							
		Sheetpile (16' to 19' deep @ PZ40 lb/sf)	1,191	ton	$4,500	$5,359,500	$1,339,875	$6,699,375	25%
		Mob/Demob	1	LS	$500,000	$500,000	$125,000	$625,000	25%
		Remove weaker soil to affirm structure	27,100	CY	$7.50	$203,250	$50,813	$254,063	25%
		Dredge Material	189,728	CY	$7.50	$1,422,960	$355,740	$1,778,700	25%
		Rock Habitat - Placement	67,000	ton	$30.00	$2,010,000	$502,500	$2,512,500	25%
		Total Lake and Shoreline Measures				$41,154,894	$10,288,723	$51,443,617	
09.		**PLANTING MEASURES**							
	1	**Invasives**							
		Eradicate aquatic invasives	1	LS	$1,153,369	$1,153,369	$288,342	$1,441,711	25%
		Remove shoreline & tributary invasive plants (391 acres, assume 40% invaded)	157	ACR	$8,000	$1,256,000	$314,000	$1,570,000	25%
	2	**Vegetation Types**							
		Aquatic Communities	705	ACR	$15,000	$10,580,250	$2,645,063	$13,225,313	25%
		Marsh Communities	231	ACR	$15,000	$3,462,450	$865,613	$4,328,063	25%
		Riparian Communities	23	ACR	$36,000	$821,160	$205,290	$1,026,450	25%
		Meadow Communities	101	ACR	$40,000	$4,054,800	$1,013,700	$5,068,500	25%
		Marsh/Meadow Communities	95	ACR	$35,000	$3,324,850	$831,163	$4,155,813	25%
		Meadow/Riparian Communities	37	ACR	$40,000	$1,477,200	$369,300	$1,846,500	25%
		Total Planting Measures				$26,129,879	$6,532,470	$32,662,348	
		Construction Cost				$67,284,772	$16,821,193	$84,105,965	
30.		**Adaptive Management (3% of Construction Cost)**				$2,523,179		$2,523,179	
		Planning, Engineering and Design (PED), 10%				$8,410,597		$8,410,597	
31.		**Construction Management (S&A), 6.7%**				$5,635,100		$5,635,100	
		Engineering During Construction (EDC), 1.5%				$1,261,589		$1,261,589	
		Total Project Cost				$85,115,237	$16,821,193	$101,936,430	
		O & M Costs (annual costs over life of project).				$1,144,682			
		TOTAL PROJECT COST FOR ALTERNATIVE A (Including Real Estate)				$97,334,275	$16,821,193	$114,155,468	
		USFS LAND RESTORATION							
		Real estate impact							
		Planting							
		Geomorphic Restructuring							
		Subtotal Federal Non-Corps (USFS) Costs							

U.S. Department
of Transportation

**Federal Aviation
Administration**

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS

Date: 5/1/97
Initiated by: AAS-310 and APP-600

AC No: 150/5200-33
Change:

1. PURPOSE. This advisory circular (AC) provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. It also provides guidance concerning the placement of new airport development projects (including airport construction, expansion, and renovation) pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICATION. The standards, practices, and suggestions contained in this AC are recommended by the Federal Aviation Administration (FAA) for use by the operators and sponsors of all public-use airports. In addition, the standards, practices, and suggestions contained in this AC are recommended by the FAA as guidance for land use planners, operators, and developers of projects, facilities, and activities on or near airports.

3. BACKGROUND. Populations of many species of wildlife have increased markedly in the last few years. Some of these species are able to adapt to human-made environments, such as exist on and around airports. The increase in wildlife populations, the use of larger turbine engines, the increased use of twin-engine aircraft, and the increase in air-traffic, all combine to increase the risk, frequency, and potential severity of wildlife-aircraft collisions.

Most public-use airports have large tracts of open, unimproved land that are desirable for added margins of safety and noise mitigation. These areas can present potential hazards to aviation because they often attract hazardous wildlife. During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives world-wide, as well as billions of dollars worth of aircraft damage. Hazardous wildlife attractants near airports could jeopardize future airport expansion because of safety considerations.

DAVID L. BENNETT
Director, Office of Airport Safety and Standards

SECTION 1. HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. TYPES OF HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS. Human-made or natural areas, such as poorly-drained areas, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airport's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety.

All species of wildlife can pose a threat to aircraft safety. However, some species are more commonly involved in aircraft strikes than others. Table 1 lists the wildlife groups commonly reported as being involved in damaging strikes to U.S. aircraft from 1993 to 1995.

Table 1. Wildlife Groups Involved in Damaging Strikes to Civilian Aircraft, USA, 1993-1995.

Wildlife Groups	Percent involvement in reported damaging strikes
Gulls	28
Waterfowl	28
Raptors	11
Doves	6
Vultures	5
Blackbirds-Starlings	5
Corvids	3
Wading birds	3
Deer	11
Canids	1

1-2. LAND USE PRACTICES. Land use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife-aircraft collisions. FAA recommends against land use practices, within the siting criteria stated in 1-3, that attract or sustain populations of hazardous wildlife within the vicinity of airports or cause movement of hazardous wildlife onto, into, or across the approach or departure airspace, aircraft movement area, loading ramps, or aircraft parking area of airports.

Airport operators, sponsors, planners, and land use developers should consider whether proposed land uses, including new airport development projects, would increase the wildlife hazard. Caution should be exercised to ensure that land use practices on or near airports do not enhance the attractiveness of the area to hazardous wildlife.

1-3. SITING CRITERIA. FAA recommends separations when siting any of the wildlife attractants mentioned in Section 2 or when planning new airport development projects to accommodate aircraft movement. The distance between an airport's aircraft movement areas, loading ramps, or aircraft parking areas and the wildlife attractant should be as follows:

a. Airports serving piston-powered aircraft. A distance of 5,000 feet is recommended.

b. Airports serving turbine-powered aircraft. A distance of 10,000 feet is recommended.

c. Approach or Departure airspace. A distance of 5 statute miles is recommended, if the wildlife attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

SECTION 2. LAND USES THAT ARE INCOMPATIBLE WITH SAFE AIRPORT OPERATIONS.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment are highly variable and may depend on several factors, including land-use practices on or near the airport. It is important to identify those land use practices in the airport area that attract hazardous wildlife. This section discusses land use practices known to threaten aviation safety.

2-2. PUTRESCIBLE-WASTE DISPOSAL OPERATIONS. Putrescible-waste disposal operations are known to attract large numbers of wildlife that are hazardous to aircraft. Because of this, these operations, when located within the separations identified in the sitting criteria in 1-3 are considered incompatible with safe airport operations.

FAA recommends against locating putrescible-waste disposal operations inside the separations identified in the siting criteria mentioned above. FAA also recommends against new airport development projects that would increase the number of aircraft operations or that would accommodate larger or faster aircraft, near putrescible-waste disposal operations located within the separations identified in the siting criteria in 1-3.

2-3. WASTEWATER TREATMENT FACILITIES. Wastewater treatment facilities and associated settling ponds often attract large numbers of wildlife that can pose a threat to aircraft safety when they are located on or near an airport.

a. New wastewater treatment facilities. FAA recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in the siting criteria in 1-3. During the siting analysis for wastewater treatment facilities, the potential to attract hazardous wildlife should be considered if an airport is in the vicinity of a proposed site. Airport operators should voice their opposition to such sitings. In addition, they should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

b. Existing wastewater treatment facilities. FAA recommends correcting any wildlife hazards arising from existing wastewater treatment facilities located on or near airports without delay, using appropriate wildlife hazard mitigation techniques. Accordingly, measures to minimize hazardous wildlife attraction should be developed in consultation with a wildlife damage management biologist. FAA recommends that wastewater treatment facility operators incorporate appropriate wildlife hazard mitigation techniques into their operating practices. Airport operators also should encourage those operators to incorporate these mitigation techniques in their operating practices.

c. Artificial marshes. Waste-water treatment facilities may create artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. FAA recommends against establishing artificial marshes within the separations identified in the siting criteria stated in 1-3.

d. Wastewater discharge and sludge disposal. FAA recommends against the discharge of wastewater or sludge on airport property. Regular spraying of wastewater or sludge disposal on unpaved areas may improve soil moisture and quality. The resultant turf growth requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw. The maimed or flushed organisms and the straw can attract hazardous wildlife and jeopardize aviation safety. In addition, the improved turf may attract grazing wildlife such as deer and geese.

Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

e. Underwater waste discharges. The underwater discharge of any food waste, e.g., fish processing offal, that could attract scavenging wildlife is not recommended within the separations identified in the siting criteria in 1-3.

2-4. WETLANDS.

a. Wetlands on or near Airports.

(1) Existing Airports. Normally, wetlands are attractive to many wildlife species. Airport operators with wetlands located on or nearby airport property should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations.

(2) Airport Development. When practicable, the FAA recommends siting new airports using the separations identified in the siting criteria in 1-3. Where alternative sites are not practicable or when expanding existing airports in or near wetlands, the wildlife hazards should be evaluated and minimized through a wildlife management plan prepared by a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers (COE).

NOTE: If questions exist as to whether or not an area would qualify as a wetland, contact the U.S. Army COE, the Natural Resource Conservation Service, or a wetland consultant certified to delineate wetlands.

b. Wetland mitigation. Mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects. Wetland mitigation should be designed so it does not create a wildlife hazard.

(1) FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in the siting criteria in 1-3. Wetland mitigation banks meeting these siting criteria offer an ecologically sound approach to mitigation in these situations.

(2) Exceptions to locating mitigation activities outside the separations identified in the siting criteria in 1-3 may be considered if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge. Such mitigation must be compatible with safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife should be avoided. On-site mitigation plans may be reviewed by the FAA to determine compatibility with safe airport operations.

(3) Wetland mitigation projects that are needed to protect unique wetland functions (see 2-4.b.(2)), and that must be located in the siting criteria in 1-3 should be identified and evaluated by a wildlife damage management biologist before implementing the mitigation. A wildlife damage management plan should be developed to reduce the wildlife hazards.

NOTE: AC 150/5000-3, *Address List for Regional Airports Division and Airports District/Field Offices*, provides information on the location of these offices.

2-5. DREDGE SPOIL CONTAINMENT AREAS. FAA recommends against locating dredge spoil containment areas within the separations identified in the siting criteria in 1-3, if the spoil contains material that would attract hazardous wildlife.

SECTION 3. LAND USES THAT MAY BE COMPATIBLE WITH SAFE AIRPORT OPERATIONS.

3-1. GENERAL. Even though they may, under certain circumstances, attract hazardous wildlife, the land use practices discussed in this section have flexibility regarding their location or operation and may even be under the airport operator's or sponsor's control. In general, the FAA does not consider the activities discussed below as hazardous to aviation if there is no apparent attraction to hazardous wildlife, or wildlife hazard mitigation techniques are implemented to deal effectively with any wildlife hazard that may arise.

3-2. ENCLOSED WASTE FACILITIES. Enclosed trash transfer stations or enclosed waste handling facilities that receive garbage indoors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles, generally would be compatible, from a wildlife perspective, with safe airport operations, provided they are not located on airport property or within the runway protection zone (RPZ). No putrescible-waste should be handled or stored outside at any time, for any reason, or in a partially enclosed structure accessible to hazardous wildlife.

Partially enclosed operations that accept putrescible-waste are considered to be incompatible with safe airport operations. FAA recommends these operations occur outside the separations identified in the siting criteria in 1-3.

3-3. RECYCLING CENTERS. Recycling centers that accept previously sorted, non-food items such as glass, newspaper, cardboard, or aluminum are, in most cases, not attractive to hazardous wildlife.

3-4. COMPOSTING OPERATIONS ON AIRPORTS. FAA recommends against locating composting operations on airports. However, when they are located on an airport, composting operations should not be located closer than the greater of the following distances: 1,200 feet from any aircraft movement area, loading ramp, or aircraft parking space; or the distance called for by airport design requirements. This spacing is intended to prevent material, personnel, or equipment from penetrating any Obstacle Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway (see AC 150/5300-13, *Airport Design*). On-airport disposal of compost by-products is not recommended for the reasons stated in 2-3.d.

a. Composition of material handled. Components of the compost should never include any municipal solid waste. Non-food waste such as leaves, lawn clippings, branches, and twigs generally are not considered a wildlife attractant. Sewage sludge, wood-chips, and similar material are not municipal solid wastes and may be used as compost bulking agents.

b. Monitoring on-airport composting operations. If composting operations are to be located on airport property, FAA recommends that the airport operator monitor composting operations to ensure that steam or thermal rise does not affect air traffic in any way. Discarded leaf disposal bags or other debris must not be allowed to blow onto any active airport area. Also, the airport operator should reserve the right to stop any operation that creates unsafe, undesirable, or incompatible conditions at the airport.

3-5. ASH DISPOSAL. Fly ash from resource recovery facilities that are fired by municipal solid waste, coal, or wood, is generally considered not to be a wildlife attractant because it contains no putrescible matter. FAA generally does not consider landfills accepting only fly ash to be wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

Since varying degrees of waste consumption are associated with general incineration, FAA classifies the ash from general incinerators as a regular waste disposal by-product and, therefore, a hazardous wildlife attractant.

3-6. CONSTRUCTION AND DEMOLITION (C&D) DEBRIS LANDFILLS. C&D debris (Class IV) landfills have visual and operational characteristics similar to putrescible-waste disposal sites. When co-located with putrescible-waste disposal operations, the probability of hazardous wildlife attraction to C&D landfills increases because of the similarities between these disposal activities.

FAA generally does not consider C&D landfills to be hazardous wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

3-7. WATER DETENTION OR RETENTION PONDS. The movement of storm water away from runways, taxiways, and aprons is a normal function on most airports and is necessary for safe aircraft operations. Detention ponds hold storm water for short periods, while retention ponds hold water indefinitely. Both types of ponds control runoff, protect water quality, and can attract hazardous wildlife. Retention ponds are more attractive to hazardous wildlife than detention ponds because they provide a more reliable water source.

To facilitate hazardous wildlife control, FAA recommends using steep-sided, narrow, linearly-shaped, rip-rap lined, water detention basins rather than retention basins. When possible, these ponds should be placed away from aircraft movement areas to minimize aircraft-wildlife interactions. All vegetation in or around detention or retention basins that provide food or cover for hazardous wildlife should be eliminated.

If soil conditions and other requirements allow, FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

3-8. LANDSCAPING. Wildlife attraction to landscaping may vary by geographic location. FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. All landscaping plans should be reviewed by a wildlife damage management biologist. Landscaped areas should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-9. GOLF COURSES. Golf courses may be beneficial to airports because they provide open space that can be used for noise mitigation or by aircraft during an emergency. On-airport golf courses may also be a concurrent use that provides income to the airport.

Because of operational and monetary benefits, golf courses are often deemed compatible land uses on or near airports. However, waterfowl (especially Canada geese) and some species of gulls are attracted to the large, grassy areas and open water found on most golf courses. Because waterfowl and gulls occur throughout the U.S., FAA recommends that airport operators exercise caution and consult with a wildlife damage management biologist when considering proposals for golf course construction or expansion on or near airports. Golf courses should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-10. AGRICULTURAL CROPS. As noted above, airport operators often promote revenue-generating activities to supplement an airport's financial viability. A common concurrent use is agricultural crop production. Such use may create potential hazards to aircraft by attracting wildlife. Any proposed on-airport agricultural operations should be reviewed by a wildlife damage management biologist. FAA generally does not object to agricultural crop production on airports when: wildlife hazards are not predicted; the guidelines for the airport areas specified in 3-10.a-f. are observed; and the agricultural operation is closely monitored by the airport operator or sponsor to ensure that hazardous wildlife are not attracted.

NOTE: If wildlife becomes a problem due to on-airport agricultural operations, FAA recommends undertaking the remedial actions described in 3-10.f.

a. Agricultural activities adjacent to runways. To ensure safe, efficient aircraft operations, FAA recommends that no agricultural activities be conducted in the Runway Safety Area (RSA), OFA, and the OFZ (see AC 150/5300-13).

b. Agricultural activities in areas requiring minimum object clearances. Restricting agricultural operations to areas outside the RSA, OFA, OFZ, and Runway Visibility Zone (RVZ) (see AC 150/5300-13) will normally provide the minimum object clearances required by FAA's airport design standards. FAA recommends that farming operations not be permitted within areas critical to the proper operation of localizers, glide slope indicators, or other visual or electronic navigational aids. Determinations of minimal areas that must be kept free of farming operations should be made on a case-by-case basis. If navigational aids are present, farm leases for on-airport agricultural activities should be coordinated with FAA's Airway Facilities Division, in accordance with FAA Order 6750.16, *Siting Criteria for Instrument Landing Systems.*

NOTE: Crop restriction lines conforming to the dimensions set forth in Table 2 will normally provide the minimum object clearance required by

FAA airport design standards. The presence of navigational aids may require expansion of the restricted area.

c. Agricultural activities within an airport's approach areas. The RSA, OFA, and OFZ all extend beyond the runway shoulder and into the approach area by varying distances. The OFA normally extends the farthest and is usually the controlling surface. However, for some runways, the TSS (see AC 150/5300-13, Appendix 2) may be more controlling than the OFA. The TSS may not be penetrated by any object. The minimum distances shown in Table 2 are intended to prevent penetration of the OFA, OFZ, or TSS by crops or farm machinery.

NOTE: Threshold Siting standards should not be confused with the approach areas described in Title 14, Code of Federal Regulations, Part 77, (14 CFR 77), *Objects Affecting Navigable Airspace.*

d. Agricultural activities between intersecting runways. FAA recommends that no agricultural activities be permitted within the RVZ. If the terrain is sufficiently below the runway elevation, some types of crops and equipment may be acceptable. Specific determinations of what is permissible in this area requires topographical data. For example, if the terrain within the RVZ is level with the runway ends, farm machinery or crops may interfere with a pilot's line-of-sight in the RVZ.

e. Agricultural activities in areas adjacent to taxiways and aprons. Farming activities should not be permitted within a taxiway's OFA. The outer portions of aprons are frequently used as a taxilane and farming operations should not be permitted within the OFA. Farming operations should not be permitted between runways and parallel taxiways.

f. Remedial actions for problematic agricultural activities. If a problem with hazardous wildlife develops, FAA recommends that a professional wildlife damage management biologist be contacted and an on-site inspection be conducted. The biologist should be requested to determine the source of the hazardous wildlife attraction and suggest remedial action. Regardless of the source of the attraction, prompt remedial actions to protect aviation safety are recommended. The remedial actions may range from choosing another crop or farming technique to complete termination of the agricultural operation.

Whenever on-airport agricultural operations are stopped due to wildlife hazards or annual harvest, FAA recommends plowing under all crop residue and harrowing the surface area smooth. This will reduce or eliminate the area's attractiveness to foraging wildlife. FAA recommends that this requirement be written into all on-airport farm use contracts and clearly understood by the lessee.

Table 2. Minimum Distances Between Certain Airport Features And Any On-Airport Agriculture Crops.

Aircraft Approach Category And Design Group [1]	Distance In Feet From Runway Centerline To Crop		Distance In Feet From Runway End To Crop		Distance In Feet From Centerline Of Taxiway To Crop	Distance In Feet From Edge Of Apron To Crop
	Visual & ≥ ¾ mile	< ¾ mile	Visual & ≥ ¾ mile	< ¾ mile		
Category A & B Aircraft						
Group I	200 [2]	400	300[3]	600	45	40
Group II	250	400	400[3]	600	66	58
Group III	400	400	600	800	93	81
Group IV	400	400	1,000	1,000	130	113
Category C, D & E Aircraft						
Group I	530[3]	575[3]	1,000	1,000	45	40
Group II	530[3]	575[3]	1,000	1,000	66	58
Group III	530[3]	575[3]	1,000	1,000	93	81
Group IV	530[3]	575[3]	1,000	1,000	130	113
Group V	530[3]	575[3]	1,000	1,000	160	138
Group VI	530[3]	575[3]	1,000	1,000	193	167

1. Design Groups are based on wing span, and Category depends on approach speed of the aircraft.

Group I: Wing span up to 49 ft.	Category A: Speed less than 91 knots
Group II: Wing span 49ft. up to 78 ft.	Category B: Speed 91 knots up to 120 knots
Group III: Wing span 79 ft. up to 117 ft.	Category C: Speed 121 knots up to 140 knots
Group IV: Wing span 118 ft. up to 170 ft.	Category D: Speed 141 knots up to 165 knots
Group V: Wing span 171 ft. up to 213 ft.	Category E: Speed 166 knots or more
Group VI: Wing span 214 ft. up to 261 ft.	

2. If the runway will only serve small airplanes (12,500 lb. And under) in Design Group I, this dimension may be reduced to 125 feet; however, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.

3. These dimensions reflect the TSS as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA, and the dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.

SECTION 4. NOTIFICATION OF FAA ABOUT HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AN AIRPORT.

4-1. GENERAL. Airport operators, land developers, and owners should notify the FAA in writing of known or reasonably foreseeable land use practices on or near airports that either attract or may attract hazardous wildlife. This section discusses those notification procedures.

4-2. NOTIFICATION REQUIREMENTS FOR WASTE DISPOSAL SITE OPERATIONS. The Environmental Protection Agency (EPA) requires any operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, section 258.10, *Airport Safety*). The EPA also requires owners or operators of new municipal solid waste landfill (MSWLF) units, or lateral expansions of existing MSWLF units that are located within 10,000 feet of any airport runway end used by turbojet aircraft or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft.

a. Timing of Notification. When new or expanded MSWLFs are being proposed near airports, MSWLF operators should notify the airport operator and the FAA of this as early as possible pursuant to 40 CFR Part 258. Airport operators should encourage the MSWLF operators to provide notification as early as possible.

NOTE: AC 150/5000-3 provides information on these FAA offices.

b. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, the ability to sustain a reduction in the numbers of hazardous wildlife to levels that existed before a putrescible-waste landfill began operating has not been successfully demonstrated. For this reason, demonstrations of experimental wildlife control measures should not be conducted in active aircraft operations areas.

c. Other Waste Facilities. To claim successfully that a waste handling facility sited within the separations identified in the siting criteria in 1-3 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 3-2. FAA requests that waste site developers provide a copy of an official permit request verifying that the facility will not handle putrescible material other than that as outlined in 3-2. FAA will use this information to determine if the facility will be a hazard to aviation.

4-3. NOTIFYING FAA ABOUT OTHER WILDLIFE ATTRACTANTS. While U. S. EPA regulations require landfill owners to provide notification, no similar regulations require notifying FAA about changes in other land use practices that can create hazardous wildlife attractants. Although it is not required by regulation, FAA requests those proposing land use changes such as those discussed in 2-3, 2-4, and 2-5 to provide similar notice to the FAA as early in the development process as possible. Airport operators that become aware of such proposed development in the vicinity of their airports should also notify the FAA. The notification process gives the FAA an opportunity to evaluate the effect of a particular land use change on aviation safety.

The land use operator or project proponent may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents to notify the appropriate FAA Regional Airports Division Office.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land use operator or project proponent should also forward specific details of the proposed land use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

4-5. FAA REVIEW OF PROPOSED LAND USE CHANGES.

a. The FAA discourages the development of facilities discussed in section 2 that will be located within the 5,000/10,000-foot criteria in 1-3.

b. For projects which are located outside the 5,000/10,000-foot criteria, but within 5 statute miles of the airport's aircraft movement areas, loading ramps, or aircraft parking areas, FAA may review development plans, proposed land use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. Sensitive airport areas will be identified as those that lie under or next to approach or departure airspace. This brief examination should be sufficient to determine if further investigation is warranted.

c. Where further study has been conducted by a wildlife damage management biologist to evaluate a site's compatibility with airport operations, the FAA will use the study results to make its determination.

d. FAA will discourage the development of any excepted sites (see Section 3) within the criteria specified in 1-3 if a study shows that the area supports hazardous wildlife species.

4-6. AIRPORT OPERATORS. Airport operators should be aware of proposed land use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in the siting criteria in 1-3. Particular attention should be given to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas.

a. AIP-funded airports. FAA recommends that operators of AIP-funded airports, to the extent practicable, oppose off-airport land use changes or practices (within the separations identified in the siting criteria in 1-3) that may attract hazardous wildlife. Failure to do so could place the airport operator or sponsor in noncompliance with applicable grant assurances. FAA recommends against the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Airport operators, sponsors, and planners should identify wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

b. Additional coordination. If, after the initial review by FAA, questions remain about the existence of a wildlife hazard near an airport, the airport operator or sponsor should consult a wildlife damage management biologist. Such questions may be triggered by a history of wildlife strikes at the airport or the proximity of the airport to a wildlife refuge, body of water, or similar feature known to attract wildlife.

c. Specialized assistance. If the services of a wildlife damage management biologist are required, FAA recommends that land use developers or the airport operator contact the appropriate state director of the United States Department of Agriculture/Animal Damage Control (USDA/ADC), or a consultant specializing in wildlife damage management. Telephone numbers for the respective USDA/ADC state offices may be obtained by contacting USDA/ADC's Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157. The ADC biologist or consultant should be requested to identify and quantify wildlife common to the area and evaluate the potential wildlife hazards.

d. Notifying airmen. If an existing land use practice creates a wildlife hazard, and the land use practice or wildlife hazard cannot be immediately eliminated, the airport operator should issue a Notice to Airmen (NOTAM) and encourage the land owner or manager to take steps to control the wildlife hazard and minimize further attraction.

q. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring there of (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, WILDLIFE includes feral animals and domestic animals while out of the control of their owners (14 CFR 139.3, *Certification and Operations: Land Airports Serving CAB-Certificated Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters)*).

r. Wildlife attractants. Any human-made structure, land use practice, or human-made or natural geographic feature, that can attract or sustain hazardous wildlife within the landing or departure airspace, aircraft movement area, loading ramps, or aircraft parking areas of an airport. These attractants can include but are not limited to architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquacultural activities, surface mining, or wetlands.

s. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport (14 CFR 139.3).

2. RESERVED.

APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

a. Aircraft movement area. The runways, taxiways, and other areas of an airport which are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft exclusive of loading ramps and aircraft parking areas.

b. Airport operator. The operator (private or public) or sponsor of a public use airport.

c. Approach or departure airspace. The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

d. Concurrent use. Aeronautical property used for compatible non-aviation purposes while at the same time serving the primary purpose for which it was acquired; and the use is clearly beneficial to the airport. The concurrent use should generate revenue to be used for airport purposes (see Order 5190.6A, *Airport Compliance Requirements*, sect. 5h).

e. Fly ash. The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

f. Hazardous wildlife. Wildlife species that are commonly associated with wildlife-aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a wildlife-aircraft strike hazard.

g. Piston-use airport. Any airport that would primarily serve FIXED-WING, piston-powered aircraft. Incidental use of the airport by turbine-powered, FIXED-WING aircraft would not affect this designation. However, such aircraft should not be based at the airport.

h. Public-use airport. Any publicly owned airport or a privately-owned airport used or intended to be used for public purposes.

i. Putrescible material. Rotting organic material.

j. Putrescible-waste disposal operation. Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

k. Runway protection zone (RPZ). An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the design aircraft, type of operation, and visibility minimum.

l. Sewage sludge. The de-watered effluent resulting from secondary or tertiary treatment of municipal sewage and/or industrial wastes, including sewage sludge as referenced in U.S. EPA's *Effluent Guidelines and Standards*, 40 C.F.R. Part 401.

m. Shoulder. An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface, support for aircraft running off the pavement, enhanced drainage, and blast protection (see AC 150/5300-13).

n. Turbine-powered aircraft. Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

o. Turbine-use airport. Any airport that ROUTINELY serves FIXED-WING turbine-powered aircraft.

p. Wastewater treatment facility. Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 C.F. R. Section 403.3 (o), (p), & (q)).

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
Checking Account:	10010-00-001						
148367	AEICAS / AEI-CASC	07/14/10	2	30-01	001988	RATHBUNCK	350.00
						AEICAS Subtotal :	350.00
148368	ALLPRO / All Protection Alarm Co.	07/14/10	2	35304	001988	FACILMAINT	175.00
						ALLPRO Subtotal :	175.00
148369	ATT785 / AT&T	07/14/10	2	06242010	001988	PHONE-LD	82.75
						ATT785 Subtotal :	82.75
148370	BBDSPL / Big Bear Disposal	07/14/10	2	233826	001988	UTIL-RAMPS	178.02
						BBDSPL Subtotal :	178.02
148371	BMARIN / Big Bear Marina	07/14/10	2	10311102	001988	PETRO-BOAT	1197.37
						BMARIN Subtotal :	1197.37
148372		07/14/10	2	10311104	001988	CARPROUNDU	100.00
						BMARIN Subtotal :	100.00
148373	BVELEC / Bear Valley Electric	07/14/10	2	06302010	001988	UTIL-DAM	67.05
						BVELEC Subtotal :	67.05
148374	CNKLIN / Conklin Paints	07/14/10	2	80967	001988	EASTMAINT	29.97
148374		07/14/10	2	80971	001988	EASTMAINT	96.56
						CNKLIN Subtotal :	126.53
148375	CNTYSV / Water & Sanitation	07/14/10	2	06302010A	001988	UTIL-RAMPS	102.16
148375		07/14/10	2	06302010B	001988	UTIL-RAMPS	102.16
						CNTYSV Subtotal :	204.32
148376	COCKRE / Tyler Cockrell	07/14/10	2	06302010	001988	RAMPSUPTRA	47.10
						COCKRE Subtotal :	47.10
148377	DIVERS / Diversified Products, Inc.	07/14/10	2	9961135	001988	PATROLBOAT	69.25
148377		07/14/10	2	9988151	001988	PATROLBOAT	121.91
148377		07/14/10	2	9988216	001988	PATROLBOAT	117.77
148377		07/14/10	2	9988651	001988	FACILMAINT	546.12
						DIVERS Subtotal :	855.05
148378	DWP / Department of Water and Power	07/14/10	2	06292010A	001988	UTIL-RAMPS	181.32
148378		07/14/10	2	06292010B	001988	UTIL-MAIN	13.40
148378		07/14/10	2	06292010C	001988	UTIL-RAMPS	17.87
148378		07/14/10	2	06292010D	001988	UTIL-MAIN	44.15

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
148378		07/14/10	2	06292010E	001988	UTIL-MAIN	128.34
						DWP Subtotal :	385.08
148379	GRZZLY / Grizzly	07/14/10	2	536741	001988	PUBLICINFO	83.10
148379		07/14/10	2	536953	001988	LEGALNOTIC	76.18
						GRZZLY Subtotal :	159.28
148380	HAUPT / Ralph W. Haupt	07/14/10	2	9108	001988	PETRO-AUTO	60.54
148380		07/14/10	2	9109	001988	PETRO-AUTO	57.83
						HAUPT Subtotal :	118.37
148381	LEMIEU / Lemieux & O'neill A Professional	07/14/10	2	20-999M131	001988	RETAINER	3500.00
						LEMIEU Subtotal :	3500.00
148382	MASTER / FIRST BANKCARD CENTER	07/14/10	2	0630102328	001988	MASTER320	2636.44
						MASTER Subtotal :	2636.44
148383		07/14/10	2	0630108541	001988	MASTER102	588.38
						MASTER Subtotal :	588.38
148384		07/14/10	2	0630102502	001988	MASTER	9.06
						MASTER Subtotal :	9.06
148385		07/14/10	2	0630107379	001988	MASTER	8.39
						MASTER Subtotal :	8.39
148386		07/14/10	2	0630104817	001988	MASTER	8.56
						MASTER Subtotal :	8.56
148387	MCMSTR / McMaster-Carr Supply Co.	07/14/10	2	58856064	001988	FACILMAINT	579.43
						MCMSTR Subtotal :	579.43
148388	MCOYBR / Mountain Water Company	07/14/10	2	17995	001988	UTILITIES	145.15
						MCOYBR Subtotal :	145.15
148389	QUILL / Quill Corporation	07/14/10	2	6281236	001988	OFFSUPPLIS	41.86
						QUILL Subtotal :	41.86
148390	RDIOSH / RadioShack	07/14/10	2	5139941	001988	FACILMAINT	21.74
148390		07/14/10	2	515352	001988	EASTMAINT	13.89
148390		07/14/10	2	515895	001988	FACILMAINT	16.30
148390		07/14/10	2	516079	001988	WESTMAINT	7.38
148390		07/14/10	2	516156	001988		7.06

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
						RDIOSH Subtotal :	66.37
148391	ROTARY / Rotary Club of Big Bear Lake	07/14/10	2	IP-0626	001988	MEMBERSHIP	111.00
						ROTARY Subtotal :	111.00
148392	SBVMWD / SAN BERNARDINO VALLEY MWD	07/14/10	2	2164	001988	SASUCKERTF	17500.00
						SBVMWD Subtotal :	17500.00
148393	SCOTTE / Scott Equipment, Inc.	07/14/10	2	E47165	001988	OFROADMAIN	216.85
						SCOTTE Subtotal :	216.85
148394	TCM / TCM	07/14/10	2	877	001988	JANITSUPPL	1104.64
						TCM Subtotal :	1104.64
148395	TERMIN / TERMINIX INTERNATIONAL	07/14/10	2	296528048	001988	FACILMAINT	49.00
						TERMIN Subtotal :	49.00
148396	TIFCO / Tifco Industries	07/14/10	2	70618909	001988	SHOPMAINT	392.50
148396		07/14/10	2	70619179	001988	SHOPMAINT	117.68
						TIFCO Subtotal :	510.18
148397	UNIQUE / Unique Awards	07/14/10	2	05272010	001988	CARPROUNDU	540.71
						UNIQUE Subtotal :	540.71
148398	VERIZO / Verizon California	07/14/10	2	06252010	001988	PHONE-WS	31.71
148398		07/14/10	2	06282010	001988	PHONE-DAM	40.90
						VERIZO Subtotal :	72.61
148399	VERWIR / VERIZON WIRELESS	07/14/10	2	884668139	001988	PHONE-CELL	250.52
						VERWIR Subtotal :	250.52
148400	VOLVOP / Volvo Penta of the Americas, Inc.	07/14/10	2	384076	001988	PATROLBOAT	288.54
						VOLVOP Subtotal :	288.54
148401	WTACON / WTA CONSTRUCTION COMPANY	07/14/10	2	2682	001988	ERPAVPROJ	142540.20
						WTACON Subtotal :	142540.20
148402	ACWAHB / ACWA Health Benefits Authority (H	07/15/10	2	09012010	001991	HEALTHINS	15435.12
						ACWAHB Subtotal :	15435.12
148403	ASSARI / RAFFI ASSARIAN	07/15/10	2	03662	001991	PERMIT	85.00

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
						ASSARI Subtotal :	85.00
148404	BBDSPL / Big Bear Disposal	07/15/10	2	234093	001991	UTIL-MAIN	341.89
						BBDSPL Subtotal :	341.89
148405	BBPROD / BIG BEAR PRODUCTIONS	07/15/10	2	07032010	001991	MULTIMEDIA	6601.00
						BBPROD Subtotal :	6601.00
148406	BBSHET / Big Bear Sheet Metal	07/15/10	2	3298	001991	FACILMAINT	120.97
						BBSHET Subtotal :	120.97
148407	BMARIN / Big Bear Marina	07/15/10	2	10311103	001991	PETRO-BOAT	1420.06
						BMARIN Subtotal :	1420.06
148408	BRADYJ / JACKIE BRADY	07/15/10	2	03832	001991	PERMIT	170.00
						BRADYJ Subtotal :	170.00
148409	CONTAI / Container Storage Solutions	07/15/10	2	07242010A	001991	QUAGGA	67.97
148409		07/15/10	2	07242010B	001991	QUAGGA	67.97
148409		07/15/10	2	08072010	001991	SHOPMAINT	108.75
						CONTAI Subtotal :	244.69
148410	DISH / Dish Network	07/15/10	2	07122010	001991	UTIL-MAIN	55.98
						DISH Subtotal :	55.98
148411	IDEARC / SUPERMEDIA LLC	07/15/10	2	07012010	001991	PHONE-MAIN	62.75
						IDEARC Subtotal :	62.75
148412	MCOYBR / Mountain Water Company	07/15/10	2	18122	001991	UTIL-RAMPS	110.00
						MCOYBR Subtotal :	110.00
148413	NORSHO / North Shore Trading Company	07/15/10	2	07102010	001991	SPEVNTDEPO	280.00
						NORSHO Subtotal :	280.00
148414	PAPERC / The Paper Clip	07/15/10	2	044673	001991	OFFICSUPPL	16.86
						PAPERC Subtotal :	16.86
148415	PERS / Public Employees' Retirement Syst	07/15/10	2	07103	001991	PERS	4781.13
						PERS Subtotal :	4781.13
148416	QUILL / Quill Corporation	07/15/10	2	6494499	001991	OFFSUPPLS	310.23
148416		07/15/10	2	6494506	001991	OFFICPRINT	344.51
148416		07/15/10	2	6523753	001991	OFFICSUPPL	44.01

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
						QUILL Subtotal :	698.75
148417	UPS / UPS	07/15/10	2	F33Y11280	001991	SHIPING	451.41
						UPS Subtotal :	451.41
148418	VERIZO / Verizon California	07/15/10	2	07012010A	001991	PHONE-RAMP	48.31
148418		07/15/10	2	07012010B	001991	PHONE-MAIN	55.73
148418		07/15/10	2	07012010C	001991	PHONE-MAIN	604.33
148418		07/15/10	2	07012010D	001991	PHONE-RAMP	46.32
148418		07/15/10	2	07012010E	001991	PHONE-RAMP	45.47
						VERIZO Subtotal :	800.16
148419	XEROX / Xerox Corporation	07/15/10	2	48818604	001991	COPIERLEAS	1423.88
						XEROX Subtotal :	1423.88
148420	JILLAN / JILLANA FINE ART	07/19/10	2	07162010	001993	PUBLICINFO	125.00
						JILLAN Subtotal :	125.00
148421	ALLPRO / All Protection Alarm Co.	07/24/10	2	52441	001998	FACILMAINT	35.00
148421		07/24/10	2	52452	001998	DAMMAINT	120.00
148421		07/24/10	2	52693	001998	FACILMAINT	135.00
148421		07/24/10	2	52778	001998	FACILMAINT	30.00
148421		07/24/10	2	52850	001998	FACILMAINT	60.00
148421		07/24/10	2	52979	001998	FACILMAINT	175.00
						ALLPRO Subtotal :	555.00
148422	BMARIN / Big Bear Marina	07/24/10	2	10311112	001998	PETRO-BOAT	2539.44
						BMARIN Subtotal :	2539.44
148423	BVELEC / Bear Valley Electric	07/24/10	2	07092010A	001998	UTIL-MAIN	21.81
148423		07/24/10	2	07092010B	001998	UTIL-MAIN	3219.24
148423		07/24/10	2	07092010C	001998	UTIL-RV	3097.83
						BVELEC Subtotal :	6338.88
148424	BVHOSP / Bear Valley Community Hospital	07/24/10	2	06368974	001998	OSHAFIRSTA	289.94
						BVHOSP Subtotal :	289.94
148425	CCONNE / CONNELLY PUMPING SERVICES	07/24/10	2	9496	001998	SSRENTAL	280.33
148425		07/24/10	2	9502	001998	SSRENTAL	245.00
148425		07/24/10	2	9503	001998	SSRENTAL	170.14
148425		07/24/10	2	9504	001998	SSRENTAL	340.28
148425		07/24/10	2	9509	001998	SSRENTAL	340.28

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

Active Sessions (Not Included in Report)
001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
148425		07/24/10	2	9552	001998	SSPUMPING	165.00
						CCONNE Subtotal :	1541.03
148426	COMPVI / Computer Village	07/24/10	2	118180	001998	FACILMAINT	100.00
148426		07/24/10	2	118224	001998	FACILMAINT	750.00
148426		07/24/10	2	118406	001998	FACILMAINT	550.00
						COMPVI Subtotal :	1400.00
148427		07/24/10	2	118639	001998	COMPCONSLT	750.00
						COMPVI Subtotal :	750.00
148428	CONTAI / Container Storage Solutions	07/24/10	2	08242010EA	001998	QUAGGA	67.97
148428		07/24/10	2	08242010WE	001998	QUAGGA	67.97
148428		07/24/10	2	09072010	001998	MAINTSHOP	108.75
						CONTAI Subtotal :	244.69
148429	MCMSTR / McMaster-Carr Supply Co.	07/24/10	2	59931500	001998	SHOPMAINT	141.64
						MCMSTR Subtotal :	141.64
148430	MCOYBR / Mountain Water Company	07/24/10	2	18207	001998	UTIL-RAMPS	131.00
148430		07/24/10	2	18219	001998	UTIL-RAMPS	131.00
						MCOYBR Subtotal :	262.00
148431	MERITO / Merit Oil Company	07/24/10	2	109499	001998	QUAGGAKERO	257.79
						MERITO Subtotal :	257.79
148432	MWH / MWH America, Inc.	07/24/10	2	1346330	001998	BEARCRKPET	19747.85
						MWH Subtotal :	19747.85
148433	PITNY / PITNEY BOWES (RENTAL)	07/24/10	2	1098706JY1	001998	POSTAGE	121.00
						PITNY Subtotal :	121.00
148434	PROGRE / Progressive Business Publications	07/24/10	2	482044101	001998	SUBSCRIPTI	118.56
						PROGRE Subtotal :	118.56
148435	SQUEEG / Squeegee Clean Window Service	07/24/10	2	07152010	001998	FACILMAINT	50.00
						SQUEEG Subtotal :	50.00
148436	SWSTGS / Southwest Gas Corp	07/24/10	2	07162010A	001998	UTIL-MAIN	11.00
148436		07/24/10	2	07162010B	001998	UTIL-RV	21.38

Big Bear Municipal Water District
Computer & Manual Check Register
Current and History Files, After 07/09/10
Account 10010-00-001, Sessions 000000 to 002004

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001760, 001814, 001869, 001936

Check	Payment / Vendor Information	Ck Date	Prity	Invoice	Session	Reference	Amount
						SWSTGS Subtotal :	32.38
148437	UPS / UPS	07/24/10	2	F33Y11290	001998	SHIPPING	17.15
						UPS Subtotal :	17.15
148438	VALERO / Valero Marketing and Supply Co.	07/24/10	2	07212010	001998	PETRO-AUTO	1045.73
						VALERO Subtotal :	1045.73
148439	VERIZO / Verizon California	07/24/10	2	07132010	001998	PHONE-MAIN	47.90
						VERIZO Subtotal :	47.90
148440	VERONL / VERIZON COMMUNICATIONS	07/24/10	2	07132010A	001998	PHONE-DSL	159.95
						VERONL Subtotal :	159.95
148441		07/24/10	2	07132010B	001998	PHONE-DSL	89.99
						VERONL Subtotal :	89.99
148442	VERWIR / VERIZON WIRELESS	07/24/10	2	886599869	001998	PHONE-CELL	607.18
						VERWIR Subtotal :	607.18
148443	WASTE / Solid Waste Management	07/24/10	2	047135	001998	FACILMAINT	608.78
						WASTE Subtotal :	608.78
148444	STOFCA / State of California-Empl. Dev. Dp	07/30/10	2	2010-QTR2	002000	TAXES	5039.99
						STOFCA Subtotal :	5039.99
148445	TASC / TASC	07/30/10	2	3000128795	002003	SUBSCRIPTI	600.00
						TASC Subtotal :	600.00
				Total For Check Account:	10010-00-001		250645.33
						Check Register Total :	250645.33

BIG BEAR MUNICIPAL WATER DISTRICT
REPORT TO BOARD OF DIRECTORS

MEETING DATE: AUGUST 5, 2010 ***AGENDA ITEM: 6A***

SUBJECT:

CONSIDER APPROVAL OF TERMINATION OF DOCK AGREEMENT AND RECONVEYANCE FOR EDGEWATER DOCK

RECOMMMENDATION:

The General Manger and the Operations Committee (Directors Suhay & Smith) recommend approval of termination of this agreement.

DISCUSSION/FINDINGS:

Michael Masotto, owner of the Edgewater Inn and the new owner of the adjacent residential property, David Suder, have agreed to terminate the dock agreement that obligated a shared dock system. They are both willing to accept a single slip dock each. Wayne Lemieux has drafted a termination agreement that both parties can sign that essentially reverts dock privileges to their previous conditions (see attached). The Committee indicated that new special conditions will apply for the new dock systems at both properties. The Edgewater will be limited to a single slip dock, opening towards the center of the lake, attached to the gangway system that was in place at the beginning of the summer. The dock would also have to be fully within the extended lines of Paine Court and could not extend beyond the end of the Big Bear Marina rock jetty (see attached). Special conditions for the residential property would include a single slip dock measuring not more than 16 feet wide from outside of one finger to the outside of the other finger. The slip would have to open towards the center of the lake. It would have to abide by all other dock placement and distance from shore limitations.

OTHER AGENCY INVOLVEMENT: None

FINANCING: None

Submitted by: Scott Heule, General Manager

RECORDING REQUESTED BY AND]
WHEN RECORDED MAIL TO:]
]
Big Bear Municipal Water District]
Attn: General Manager]
P. O. Box 2863]
Big Bear Lake, CA 92315]

TERMINATION OF DOCK AGREEMENT AND RECONVEYANCE

As of _____ , 2010, **Big Bear Municipal Water District** ("District"), **Michael Masotto** ("Masotto") and **Darla M. Suder and David J. Suder** ("Suders"), Wife and Husband as Joint Tenants, agree as follows:

1. Purpose.

The parties desire to terminate the Dock Agreement and Conveyance dated April 12, 2008 (the "Dock Agreement").

2. Description of Lots.

(a) Masotto owns a lot adjacent to Big Bear Lake at 40570 Simonds Drive, known currently as the Edgewater Motel, APN 0308-142-01. (For convenience, this lot will be referred to as Lot 01.) Lot 01 is more particularly described on Exhibit "A" attached hereto and hereby incorporated by reference.

(b) Suders own a lot adjacent to the Lake at 40578 Simonds Drive, APN 0308-142-02 and is contiguous to the easterly side of Lot 01. (For convenience, this lot will be referred to as Lot 02.) Lot 02 is more particularly described on Exhibit "B" attached hereto and hereby incorporated by this reference.

3. Dock Rights.

(a) Lot 01 and lot 02 will have rights, if any, appurtenant to the respective lots for the placement of docks on Big Bear Lake in accordance with the District's standard rules and regulations, and no other rights. The Dock Layout System attached to the Dock Agreement is no longer permitted.

(b) District hereby reconveys to Suders, rights, if any, appurtenant to Lot 02 for the placement of docks on the Lake.

4. Inurement.

This agreement shall inure to the parties, their successors and assigns.

5. Recordation.

This agreement shall be recorded.

IN WITNESS WHEREOF, the parties hereby have caused this Agreement to be executed the date first above written.

Big Bear Municipal Water District

By: _____
Scott Heule, General Manager

Michael Masotto

By: _____
Michael Masotto

Attest:

By: _____
Vicki Sheppard, Board Secretary

Approved as to Form:

_____
District Counsel

Darla M. Suder

By: _____
Darla M. Suder

David J. Suder

By: _____
David J. Suder

STATE OF CALIFORNIA
COUNTY OF SAN BERNARDINO

On _____, 2010, before me, _____, Notary Public, personally appeared **Scott Heule**, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the person or the entity upon behalf of which the person acted, executed the instrument.

I certify under penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____
_____, Notary Public
[Print Name]

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 2010, before me, _____, Notary Public, personally appeared **Michael Masotto,** who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the person or the entity upon behalf of which the person acted, executed the instrument.

I certify under penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____
_____, Notary Public
[Print Name]

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 2010, before me, _____, Notary Public, personally appeared **Darla M. Suder,** who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument, the person or the entity upon behalf of which the person acted, executed the instrument.

I certify under penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____
_____, Notary Public
[Print Name]

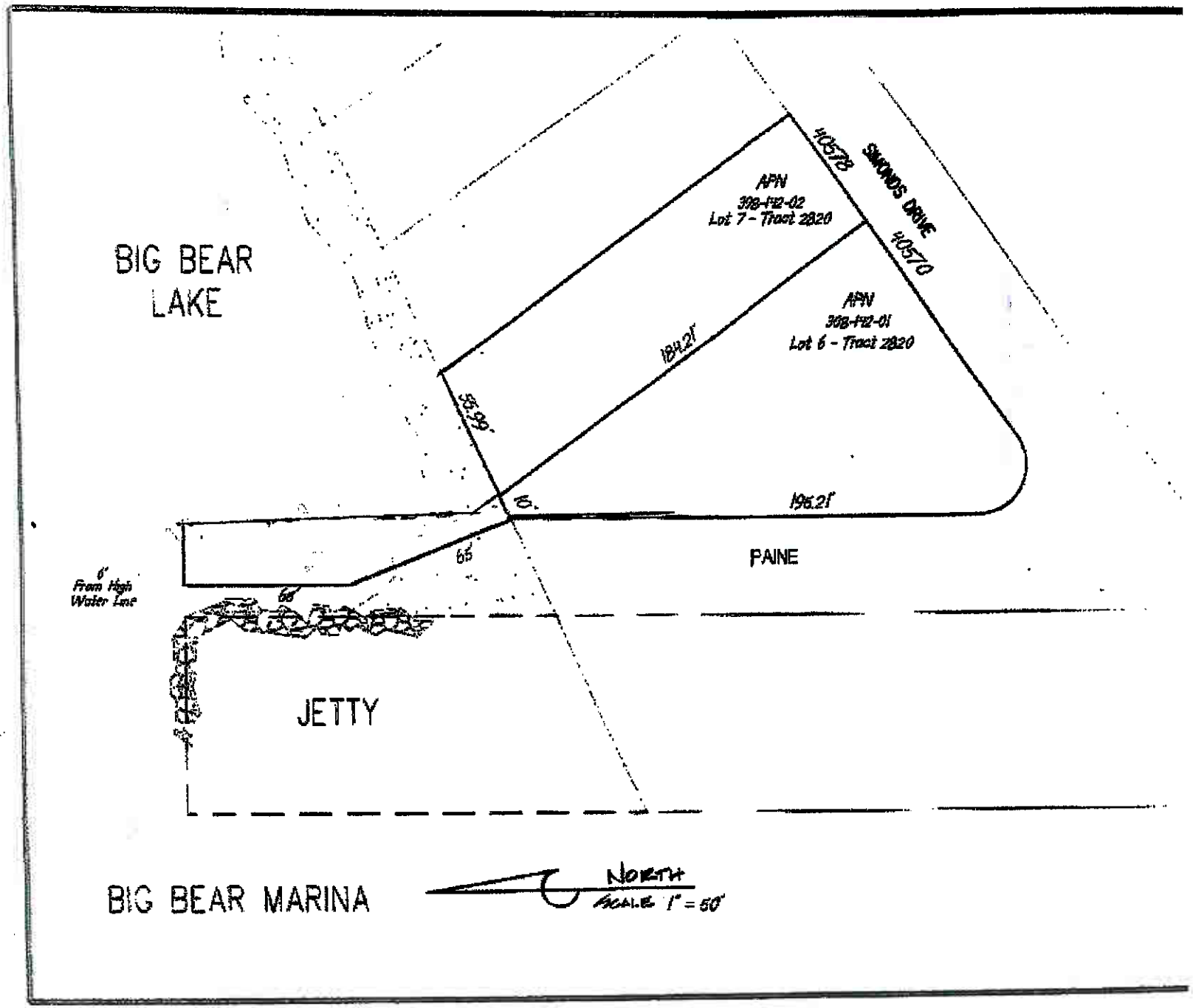
STATE OF CALIFORNIA
COUNTY OF _____

On _____, 2010, before me, _____, Notary Public, personally appeared **David J. Suder,** who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the person or the entity upon behalf of which the person acted, executed the instrument.

I certify under penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____
_____, Notary Public
[Print Name]


BIG BEAR
LAKE
APN
308-192-02
Lot 7 - Tract 2820
APN
308-192-01
Lot 6 - Tract 2820
40578
SIMONDS DRIVE
40570
181.21'
56.99'
196.21'
65'
PAINE
6'
From High
Water Line
JETTY
BIG BEAR MARINA
NORTH
SCALE 1" = 50'