

A G E N D A
BIG BEAR MUNICIPAL WATER DISTRICT

BOARD OF DIRECTORS
Regular Meeting
July 3, 2014

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

Next Resolution Number: 2014-06

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. Legal
 - C. Committee
 - D. Other
- 5. CONSENT CALENDAR**
 - A. Minutes of a Special Meeting Workshop of June 18, 2014
 - B. Minutes of a Regular Meeting of June 19, 2014
 - C. Warrant list dated June 25, 2014 for \$225,272.53
- 6. 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)
- 7. ANNOUNCEMENTS**
- 8. DIRECTOR COMMENTS**
- 9. ADJOURNMENT TO CLOSED SESSION**
- 10. CLOSED SESSION**

Adjourn to closed session regarding Pending Litigation: Case No. CIVDS 10103074 Graybill vs. BBMWD

Adjourn to closed session under Government Code Section 54956.8 Conference with Real Property Negotiator, Mike Stephenson General Manager, concerning 440 Catalina, Big Bear Lake, California, APN #2328-202-15, #2328-202-08, #2328-291-27

11. ADJOURNMENT

NEXT MEETING: Open Session at 1:00 P.M.
Thursday, July 17, 2014
Big Bear Municipal Water District
40524 Lakeview Drive, Big Bear Lake, CA

PLEASE 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 related writings or documents provided to the Board of Directors are available for public inspection at www.bbmwd.org or in the District office during business hours, 8:00 am – 4:30 pm Monday – Friday.

Big Bear Municipal Water District wishes to make all of its public meetings accessible to the public. If you need special assistance to participate in this meeting, please contact the Board Secretary. Notification 48 hours prior to the meeting will enable the District to make reasonable arrangements to ensure accessibility to this meeting

***MINUTES OF A SPECIAL MEETING WORKSHOP OF
BIG BEAR MUNICIPAL WATER DISTRICT
HELD ON WEDNESDAY, JUNE 18, 2014***

The Open Session workshop began at 1:00 PM. Those in attendance included President Murphy, Director Lewis, Director Eminger, Director Smith, General Manager Scott Heule, Lake Manager Mike Stephenson, and Board Secretary Vicki Sheppard.

STATEWIDE MERCURY TMDL

Mr. Heule made a PowerPoint presentation (copy attached) regarding mercury levels in Big Bear Lake. He reported on how mercury has affected the lake's bass population. He explained the 10 year goal of measurably reducing fish methyl-HG explaining that a baseline must be developed studying multiple species, a large sample size, and multiple years. He reported that the only choice the District seems to have at this time is to try and figure what baseline levels are in all species and how to monitor it through the years.

Mr. Stephenson reported on the alum treatment project passing out an interim report from Michael Anderson, University of Riverside (copy attached). The timeline for permits and RFP's in order to meet the timeline was discussed. The option of completing the project this year or waiting until next year (2015) was also discussed. Mr. Stephenson explained that Michael Anderson feels it would be better to shoot for next year. It was the consensus that it seems better to wait until next year.

ADJOURNMENT

There being no further business, the workshop was adjourned at 1:54PM.

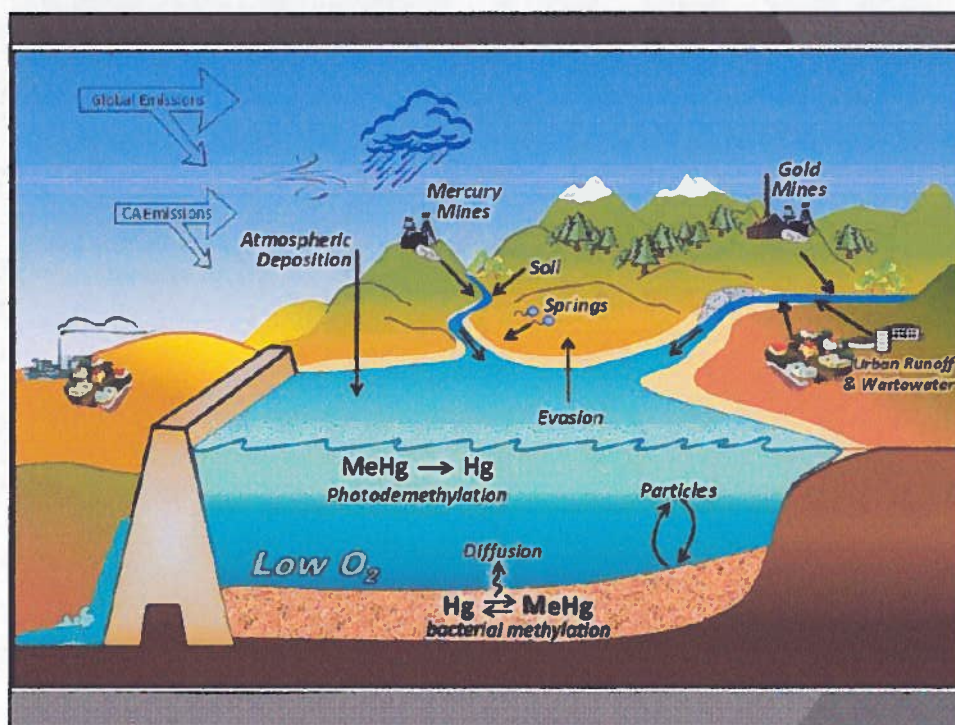
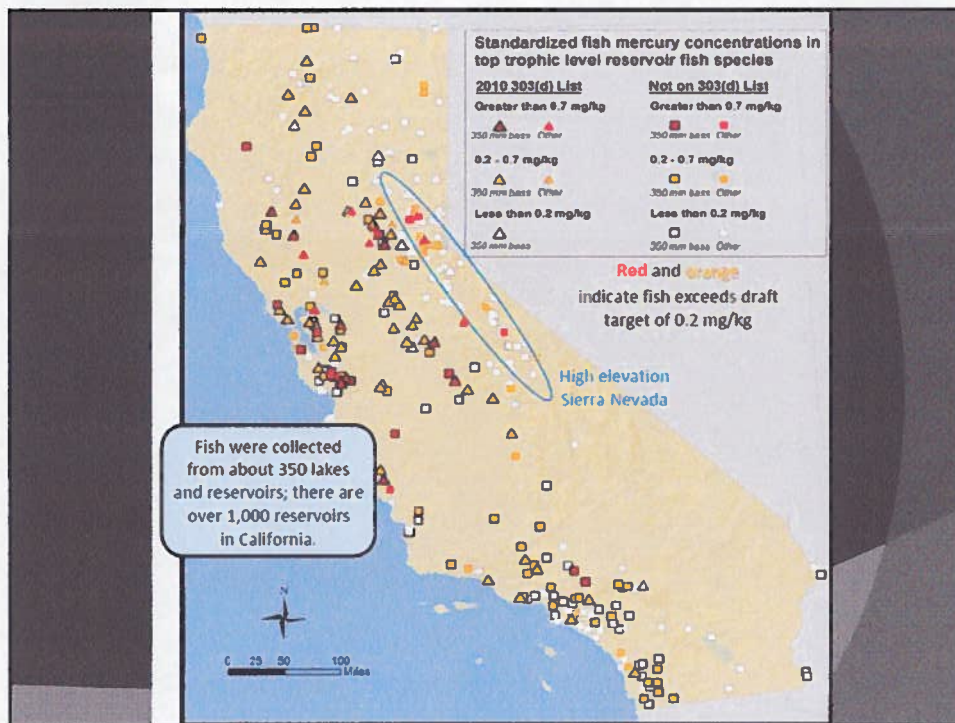
Vicki Sheppard
Secretary to the Board
Big Bear Municipal Water District

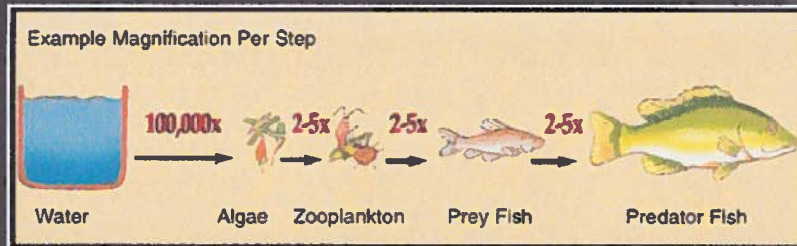
(SEAL)

June 18, 2014

WATERSHED WORKSHOP

- Mercury (Hg) in any form is toxic
- Hg + sulfate reducing bacteria + anoxic = Methylmercury
- Methylmercury most bio available form of Hg
- Bass in BBL exceed health standard of 0.2mg/kg
- BBL one of 74 reservoirs on Clean Water Act 303(d) listed as impaired for Hg





- Not looking at methods that impact water flows
- 10 year Goal = measurably reduce fish methyl-Hg
- Must develop a baseline
 - Multiple species
 - Large sample size
 - Multiple years
- Identify a sentinel species
 - Analyze yearly to measure progress
- Get fish survey reports from Calif. F&W

- Studies in BBL by District and Regional Board
 - Fish tissue
 - Water column
- Reduce Methylmercury in fish
 - Decrease bio-available Hg in reservoir
 - HOS – additional aeration
 - Manipulate food web = increase growth rate
 - Intensive fishing – cull large bass
 - Increase numbers of prey fish

ALUM TREATMENT IN BIG BEAR LAKE:
JAR TEST RESULTS, MOBILE-P MEASUREMENTS AND APPLICATION STRATEGY

M.A. Anderson, S. Boudreau, A. Pham and J. Shiba
Department of Environmental Sciences
University of California - Riverside

Introduction

Alum applications to lakes have been shown to effectively reduce internal loading of phosphorus (P), reduce algal levels and increase water clarity. Previous studies have found that Big Bear Lake is generally P-limited, with a substantial portion of P available in the water column for phytoplankton production derived from recycling from sediments (Anderson and Dyal, 2003). An alum treatment in 2004 reduced phytoplankton concentrations and increased transparency (Berkowitz and Anderson, 2005), and successfully reduced internal P loading rates by up to 90% following treatment, with successful suppression of internal loading for several years thereafter (Anderson and Paez, 2007). These reductions were achieved despite the near-record precipitation and runoff in early 2005 that greatly increased external nutrient loading, lake volume and surface area and depth. Alum treatments have a finite capacity and lifespan however; for example, internal P recycling rates increased each year following treatment (Anderson and Paez, 2007). Based upon measured increases from 2004 to 2006, internal nutrient recycling rates are projected to have returned to baseline levels, and are thus a significant factor contributing to algal growth and water quality in the lake. Only a fraction of the total P in sediments is available for release, however, with internal P recycling strongly correlated with a mobile fraction (mobile-P) that includes soluble/exchangeable and reductant-soluble forms (Reitzel et al., 2005; Pilgrim et al. 2007).

The objective of this study was to assess pH-alkalinity response to added Al, quantify mobile-P contents in the sediments and their distribution within the lake, and develop an alum application strategy.

Methods

i. Sediment sampling and locations

Intact sediment cores and sediment grab samples were collected at TMDL stations 1, 2, 6 and 9 on March 26, 2014. Samples were collected with an Ekman dredge, homogenized and

subsampled into 500 mL wide-mouth jars with Teflon lined screw top lids. A second sediment sampling campaign was conducted on April 7, 2014 that collected grab samples and short intact cores from 11 additional sites across the lake (Fig. 1). Short (10 cm) intact cores were obtained by inserting 10 cm x 6.35 cm diameter clear polycarbonate tubes into sediment within the dredge and sealed with plastic end caps. All samples were stored in a cooler and returned to the lab for analyses.

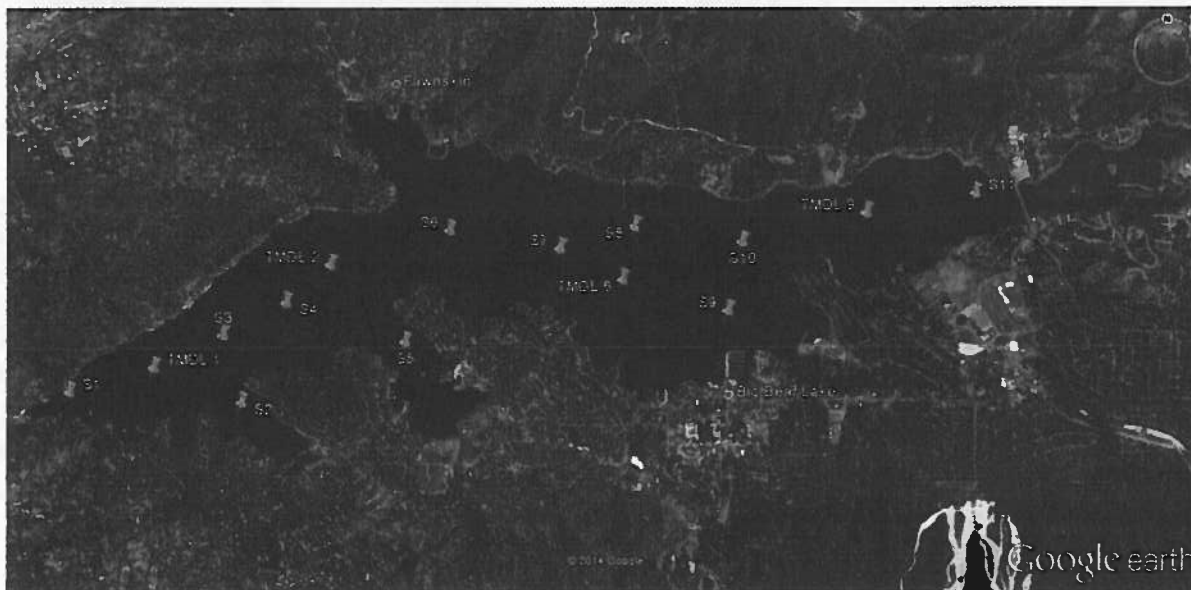


Fig. 1. Sediment sampling sites: Big Bear Lake.

ii. Jar Test: pH-Alkalinity Assessment

Jar tests were conducted to quantify the effect of different doses of Al (added as alum) on equilibrium pH and alkalinity levels. pH is a critical variable in alum applications, regulating solubility and speciation of Al (Berkowitz et al., 2005). Approximately 20-L of water was collected from Big Bear Lake on March 26, 2014 and returned to the lab for analysis. One-L samples of Big Bear Lake water were then dosed with 0, 5, 10, 15, 20, 25, 30, 35 and 40 mg L⁻¹ Al³⁺ as alum (Al₂(SO₄)₃·18H₂O) and subsampled after 24 hours. The pH was measured using an AccuMet pH meter with Fisherbrand pH electrode calibrated with Fisher pH 4 and 7 buffers. Alkalinity was determined on subsamples with potentiometric titration with standardized acid to a pH endpoint of 4.5 following method 2320 B (APHA, 1998). Measurements were also taken 72 hours later after equilibrium was reached.

iii. Sediment Analyses

Phosphorus in bottom sediments of lakes exists in numerous forms, including a mobile form (mobile-P) that includes soluble/exchangeable forms as well as that associated with iron (Fe)(III) phases that can be released upon reduction of Fe(III) under low dissolved oxygen (DO) conditions (Reitzel et al., 2005; Pilgrim et al., 2007). Mobile-P in surficial sediments has been shown to be strongly correlated with internal recycling rates (Pilgrim et al., 2007), with the mobile-P pool reduced by amounts consistent with that released to the water column (Reitzel et al., 2005).

Sediment grab samples were subsampled for dry-weight determination and extracted for mobile-P following Pilgrim et al. (2007). Water content was determined on subsamples that were heated overnight at 105 °C. Total C and N were measured by dry-combustion methods using a Thermo Flash EA NC soil analyzer (Nelson and Sommers, 1982). Inorganic C and CaCO₃ were determined manometrically following Loeppert and Suarez (1996), with organic C taken as the difference between total C and inorganic C. Duplicate analyses were conducted at a rate of at least one every 10 samples within an analytical batch.

iv. Hydroacoustic Survey

The acoustic signature of bottom sediments is increasingly used to classify sediment hardness and roughness (Sternlicht and de Moustier, 2003), thickness (Odhiambo and Boss, 2004), and has also been found to correlate with organic C and total nutrient contents as well as rates of nutrient release and sediment oxygen demand (Anderson and Pacheco, 2011). A multi-frequency hydroacoustic survey was conducted on March 28, 2014 to map out acoustical properties of sediments, sediment mobile-P distribution, and alum dose across the lake. Measurements were made using a BioSonics DTX echosounder multiplexed to a 201-kHz split-beam transducer and 430-kHz and 38-kHz single beam transducers with integrated pitch-roll sensors (Table 1) and JRC Model 202W real-time differential GPS. Data were collected on a Dell ATG laptop running BioSonics Visual Acquisition 6 software. The ping rate was set to 5 pings per second for each channel, with 0.4 ms pulse durations. Transducers were calibrated at BioSonics (Seattle, WA) in February 2014. Attributes of the bottom echo included the maximum sediment volumetric backscatter strength (Sv_{max}) that was extracted directly from echogram .dt4 binary files, while fractal (box) dimension (FD), first part of the first bottom echo (E1'), and second part of first bottom echo (E1) were calculated using BioSonics VBT software. Values were calculated using a 20-ping averaging window.

Property	DTX-38	DTX-200	DTX-420
Frequency (kHz)	38	201	430
Beam angle (°)	10.0	6.6	7.0
Source level (dB μPa^{-1})	217.0	221.3	220.0
Receive sensitivity (dB μPa^{-1})	-41.1	-57.6	-62.9
Pulse length (ms)	0.4	0.4	0.4
Pings per second (pps)	5	5	5

Results

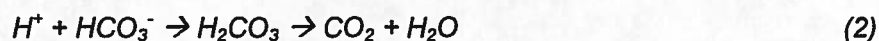
i. Jar Test Results: pH-Alkalinity Response

The native pH of the water collected from Big Bear Lake was 8.2, similar to other values measured at the lake (e.g., Berkowitz and Anderson, 2004; Anderson and Paez, 2006) and consistent with surface water in a calcareous watershed in equilibrium with atmospheric CO_2 . Alkalinity was 3.6 meq/L, representing good acid-neutralizing capacity, although the value was somewhat lower than the value of 4.0 meq/L found in 2004 (Berkowitz and Anderson, 2004).

Addition of alum resulted in an approximately linear decrease in both post-treatment pH and alkalinity (Fig. 2). Alum readily dissociates to Al^{3+} that then undergoes a hydrolysis reaction at circumneutral pH to produce 3 mols H^+ per mol Al^{3+} :



Alum treatments thus generate a significant amount of acidity that can be neutralized by bicarbonate (HCO_3^-) and other sources of alkalinity in the water via the reaction:



The reaction of HCO_3^- with H^+ produces CO_2 that can then be lost to the atmosphere, although the volatilization reaction occurs more slowly than the chemical reaction. It is for this reason that the approximate equilibrium pH (after 72 h) was consistently higher than after 24 h (except at the highest Al dose, when all alkalinity was consumed) (Fig.2). Alkalinity was unchanged over time however. Moderate doses of alum (≤ 20 mg/L) maintained $\text{pH} > 7$ (slightly basic conditions) near equilibrium, while higher doses yielded weakly acidic conditions; at high doses of alum, acid production exceeded the alkalinity of the water and resulted in strongly acidic conditions that would be unfavorable for trout and numerous other aquatic species (Fig. 2).

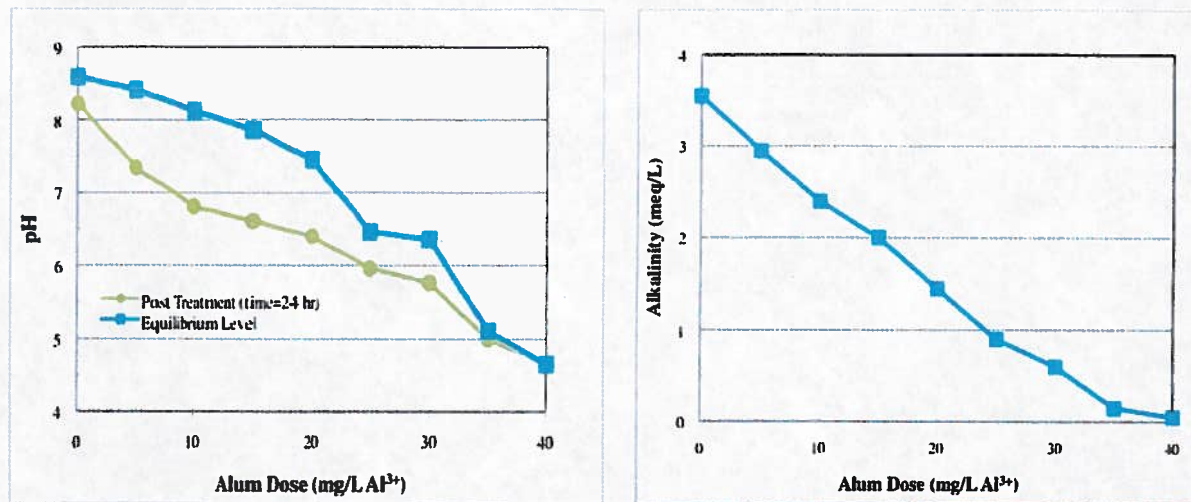


Fig. 2. Jar test results: a) pH vs alum dose (as Al), and b) alkalinity vs alum doses (as Al).

ii. Sediment Analyses

Properties of surface sediment sampled across the lake (Fig. 1) varied markedly in water content, organic C content and other properties (Table 2). Depths ranged from 14.9 m at site S1 near the buoy line at the west end of the lake to 2.4 m at S11 near the Stanfield Cutoff (Fig. 1). Sediment properties varied along this longitudinal gradient as well, with higher water contents and mobile-P concentrations generally present in the deeper waters on the western part of the lake, and much lower values on the east end (e.g., S9-11) (Table 2).

calcium

Site	Depth (m)	H ₂ O Content (% ww)	Organic C (% dw)	Total N (% dw)	CaCO ₃ (% dw)	Mobile-P (ug/g dw)
TMDL 1	12.7	85.6	6.66	0.84	7.32	270
TMDL 2	9.9	84.8	5.99	0.75	4.68	214
TMDL 6	7.9	78.5	12.05	1.26	3.41	67
TMDL 9	5.1	64.7	3.58	0.49	11.85	43
S1	14.9	84.0	5.53	0.7	6.28	219
S2	8.3	77.6	5.57	0.65	3.31	123
S3	12.0	84.6	6.13	0.79	5.86	227
S4	11.0	85.9	6.11	0.83	7.89	312
S5	6.7	66.1	<0.1	0.08	2.58	86
S6	6.0	26.9	<0.1	0.10	0.63	25
S7	7.7	80.2	13.18	1.32	3.74	141
S8	7.9	77.0	10.79	1.13	5.67	89
S9	5.7	48.0	1.61	0.26	2.15	41
S10	7.5	74.1	4.63	0.63	12.59	65
S11	2.4	57.0	2.19	0.35	16.49	29

The mobile-P contents at TMDL sites were in good agreement with measurements made on samples collected on November 6, 2003, with depth-averaged concentrations of 311 (vs. 270), 67 (vs. 67) and 75 (vs. 43) $\mu\text{g/g}$ at TMDL sites 1, 6 and 9, respectively (Aquatic Research, Inc., 2003). The longitudinal trends (Fig. 1, Table 2) are thought to result in part due to the strong winds from the west that introduce a great deal of turbulent kinetic energy, especially to the eastern end of the lake, and thus limit settling of fine organic matter and clay particles, resuspend bottom sediments, and transport/focus this material to deeper regions of the lake. Notwithstanding, there was heterogeneity that was not well-described simply by depth or longitude. For example, sediments at TMDL 6 and supplemental sites 7 and 8 had markedly higher organic C and total N contents than elsewhere in the lake, despite moderate depths and mid-longitudinal location.

While these 15 sites provide key information about sediment properties, including the amount of mobile-P available for release to the overlying water content through internal recycling, it is difficult to extrapolate to other regions on the lake. As a result, these results are used in conjunction with hydroacoustic measurements described below to develop a more complete understanding of how sediment properties vary across the lake.

iii. Hydroacoustic Results

Hydroacoustic measurements were made across 42 km of survey on March 28, 2014 that involved a series of transects across the lake, with somewhat greater density of measurements in the western portion of the lake (Fig. 3). The transects are overlain on a bathymetric map developed from the data. Approximately 100,000 pings were recorded, and averaged into 20-ping ensembles for $\sim 5,000$ measurements of sediment acoustic signatures.

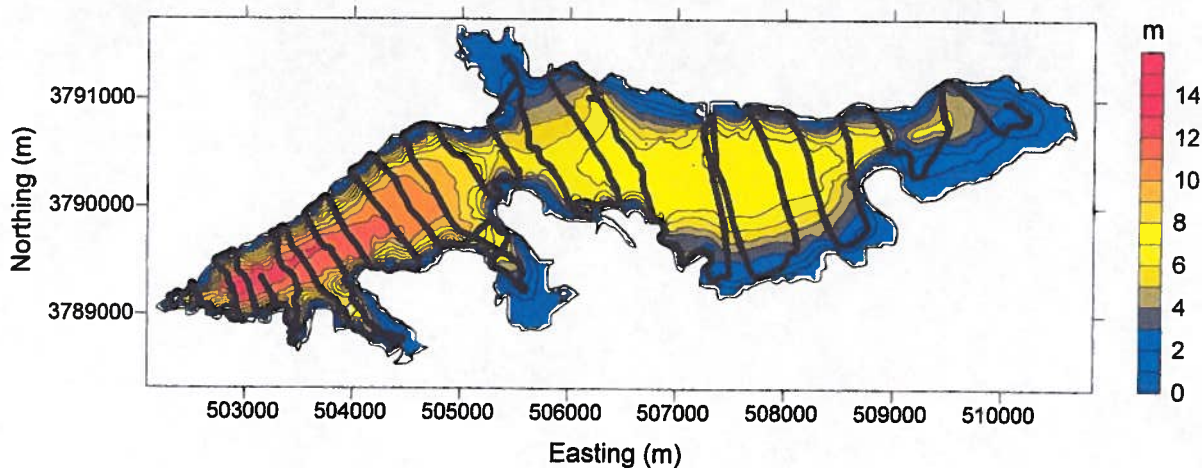


Fig. 3. Hydroacoustic survey track (March 28, 2014).

Acoustic backscatter strength as a function of depth (or range) below the transducer face, based upon the 2-way time of travel and known speed of sound in water (approximately 1500 m/s), is recorded with corresponding differentially-corrected GPS coordinates. The echo amplitude is corrected for absorption and spreading using the sonar equation and provides a measure of the bottom sediment's hardness, roughness and density contrast with water. Example echograms collected at 38-kHz and 430-kHz for a short section of the survey are shown in Fig. 4.

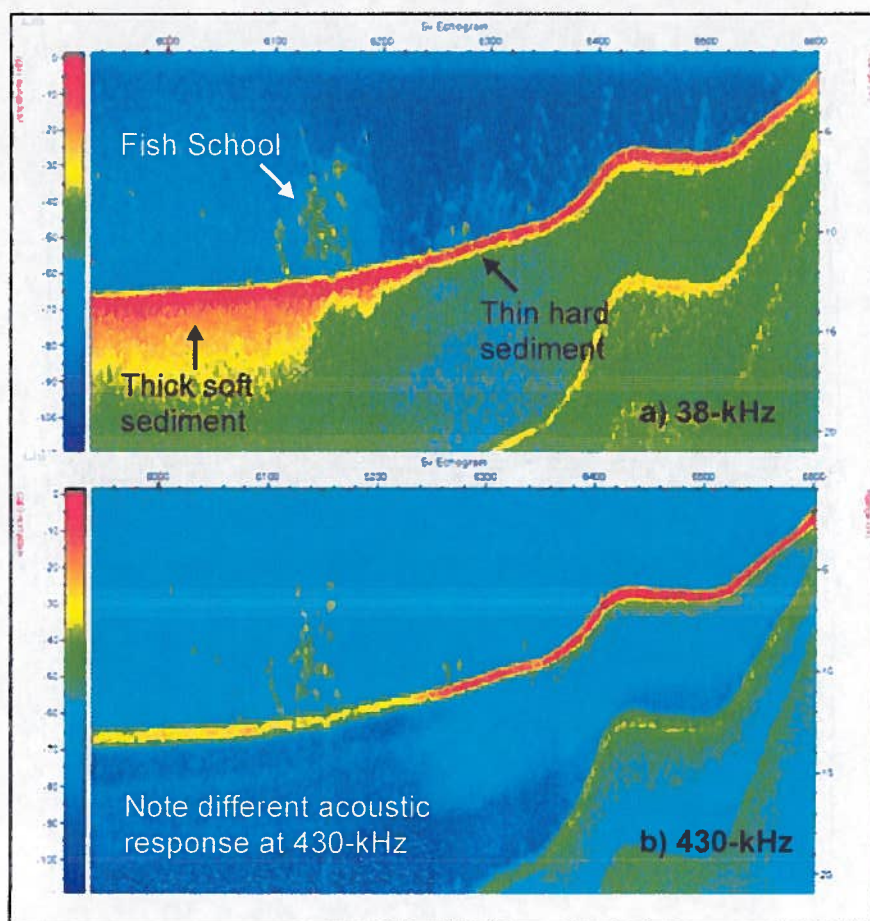


Fig. 4. Example echograms: a) 38-kHz and b) 430-kHz.

Low frequency soundwaves (e.g., 38-kHz, upper echogram) experience little absorption within water or soft cohesive sediments, and thus can penetrate significant distances into fine-textured organic sediments, as seen around ping 6000. Here strong acoustic backscatter (-10 to

-20 dB) was found extending up to about 5 m into the sediments. Fine-textured organic sediment has thus accumulated to a significant depth at this location in the lake. A short distance away (e.g., ping 6300), reverberation was limited to a very narrow region at the sediment surface, consistent with a hard dense substrate. Acoustic backscatter at 430-kHz (Fig. 4, lower echogram) revealed a very different echogram, with limited penetration of the soundwaves into soft (ping 6000) or hard (ping 6300) bottom sediment. Moreover, much weaker backscatter strength was measured from the soft thick sediments (-35 dB) when compared with the thin harder/denser sediment (-10 dB). These differences in acoustic properties for various types of sediments and different frequencies can, with adequate ground-truthing, provide a way to rapidly map the distribution of sediment type and thickness across a lake or reservoir. Hydroacoustic measurements have not heretofore been used to estimate and map mobile-P in sediments.

Regression analyses were used to determine which acoustic attributes were most strongly correlated with mobile-P content of the sediments. The fractal dimension (FD) of the bottom echo envelope at 430-kHz was found to be the strongest correlate, capturing 78% of the variance in measured mobile-P (Fig. 5). Multiple linear regression analyses did not improve the overall goodness of fit when compared to FD_{430} alone.

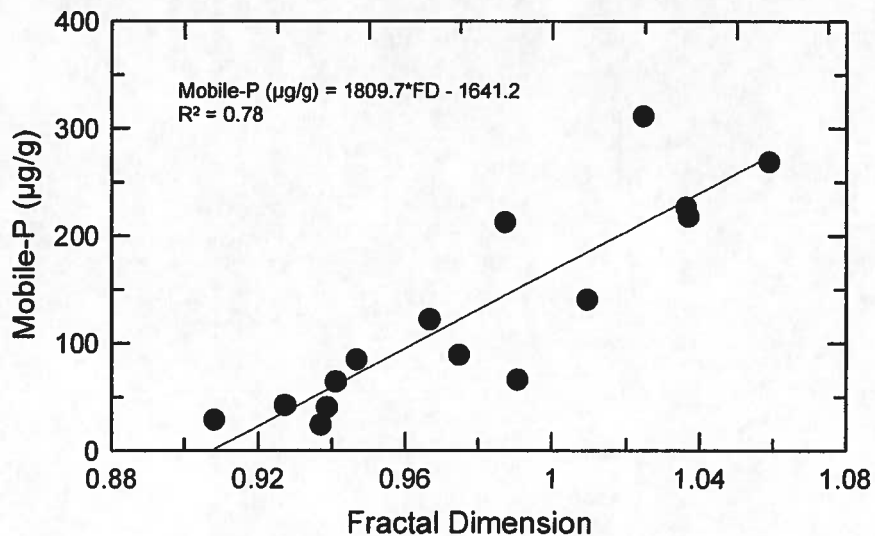


Fig. 5. Mobile-P content correlated with fractal dimension of bottom echo envelope.

The mobile-P content of the sediment, expressed on a dry-weight basis (Table 2; Fig. 5) was then converted to an areal concentration (g mobile-P/m^2) based upon measured water

content, a particle density of 2.65 g/cm^3 , and thickness of the reactive surface layer. The thickness of the reactive layer can vary, with Pilgrim et al. (2007) reporting mobile-P in the upper 4-7 cm predictive of P-release, while Reitzel et al., (2005) found mobile-P in the upper 10 cm depleted during core-flux studies and in field samples collected through the summer. Based upon previously measured vertical gradients, strong wind mixing and high rates of internal recycling, a reactive sediment thickness of 10 cm was used.

The representation of mobile-P in mass per unit area (g/m^2) corrects for differences in water content and, combined with hydroacoustic measurements of fractal dimension (Fig. 5), allowed extrapolation of mobile-P contents beyond the original 15 sites reported in Table 2 to the entire lake basin (Fig. 6). This geospatial processing was performed using the kriging algorithm within Surfer software (Golden, CO). The highest concentrations of mobile-P were found in the western portion of the lake, while much lower concentrations were present in the eastern part of the lake, with especially low levels near the Stanfield Cutoff (Fig. 6). Very low concentrations were also present near the mouth of Grout Bay. Mobile-P concentrations in Big Bear Lake are broadly consistent with those for a number of lakes in Minnesota that ranged from about $0.3 - 4 \text{ g mobile-P/m}^2$ assuming a 4-5 cm reactive layer (Pilgrim et al., 2007), but quite a bit lower than the value reported by Reitzel et al. (2005) of about 9 g mobile-P/m^2 for a shallow hypereutrophic lake in Denmark. (Since hydroacoustic measurements were not made in very shallow water at the far ends of Grout, Boulder and Metcalf Bays (Fig. 3), the mobile-P contents there are extrapolations subject to high amounts of uncertainty.)

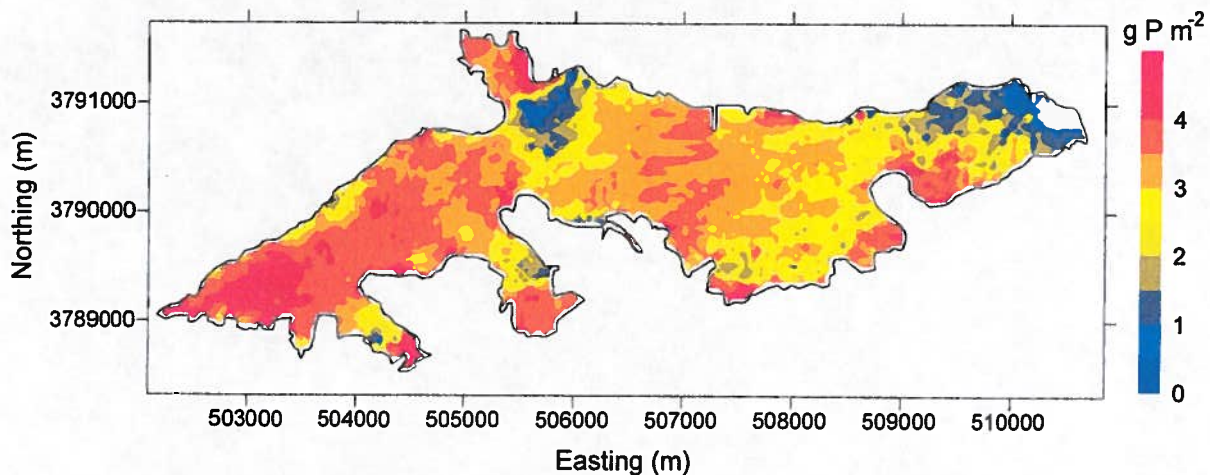


Fig. 6. Distribution of mobile-P across Big Bear Lake based upon hydroacoustic data.

iv. Considerations for Alum Treatment

With an understanding of the mobile-P contents across the lake (Fig. 6), and by extension internal P-loading, it is possible to design an alum application strategy that efficiently targets strongest sources areas with optimized alum dosages. Nonetheless, other factors must be considered in design of the treatment strategy. As indicated by the jar tests, there are upper limits to the amount of alum that can be applied before pH and alkalinity drop to ecologically critical values. The results shown in Fig. 2 thus provide a boundary condition for the amount of alum that can be added; setting a protective lower limit on equilibrium pH of 7.0, the concentration limit for Al is approximately 20 mg/L. Care is needed during application to avoid hotspots of locally higher concentrations.

Suitability of a region for treatment is also dependent upon water currents and bottom shear stress. Wind shear on the lake surface transfers momentum to the water, setting up surface waves, surface and bottom currents, and potential for sediment resuspension. Sediment resuspension has been reasonably predicted in a number of studies with relationships that use wind speed, wind direction, fetch and depth to sediment to infer loci and extent of resuspension (e.g., Carper & Bachmann, 1984). It has been shown that resuspension and erosion of fine-textured bottom sediment occurs when deep-water waves enter water shallower than one-half the wave length (Bloesch, 1995). The wavelength, L (m), of a deepwater wave is related to its period, T (s), by the relation:

$$L = \frac{gT^2}{2\pi} \quad (3)$$

where g is the gravitational constant (Martin & McCutcheon, 1999). A wave's period can be estimated using the empirical equation developed by the US Army Coastal Engineering Research Center (Carper & Bachmann, 1984) that states:

$$T = \frac{2.4\pi U \tanh \left[0.077 \left(\frac{gF}{U^2} \right)^{0.25} \right]}{g} \quad (4)$$

where U is the wind speed (m/s) and F is the fetch (m).

With typical afternoon windspeeds of 12-14 mph, orbital motion associated with surface waves would be expected to resuspend bottom sediments at depths up to about 3.5 m (Fig. 7, solid line). Ignoring the protective effect that rooted aquatic vegetation would provide, this corresponds to as much as 730 acres that would not be amenable for treatment. Periodic winds

up to about 25 mph could resuspend bottom sediments to depths >6.5 m especially at the east end of the lake (potentially up to 1300 acres) (Fig. 7, dashed line). Steep bottom slopes also inhibit sediment accumulation (Blais and Kalff, 1995). Thus, depending upon the wave-mixed depth criterion used, potentially only about 1000-1600 acres of the lake is suitable for an alum treatment based upon floc deposition and resuspension considerations, *i.e.*, where a stable floc could be delivered and maintained on the sediments. Moreover, many of these same shallow regions of the lake are also subject to extensive rooted aquatic macrophyte growth which directly extract nutrients from the sediments and thus limit recycling of P to the water column.

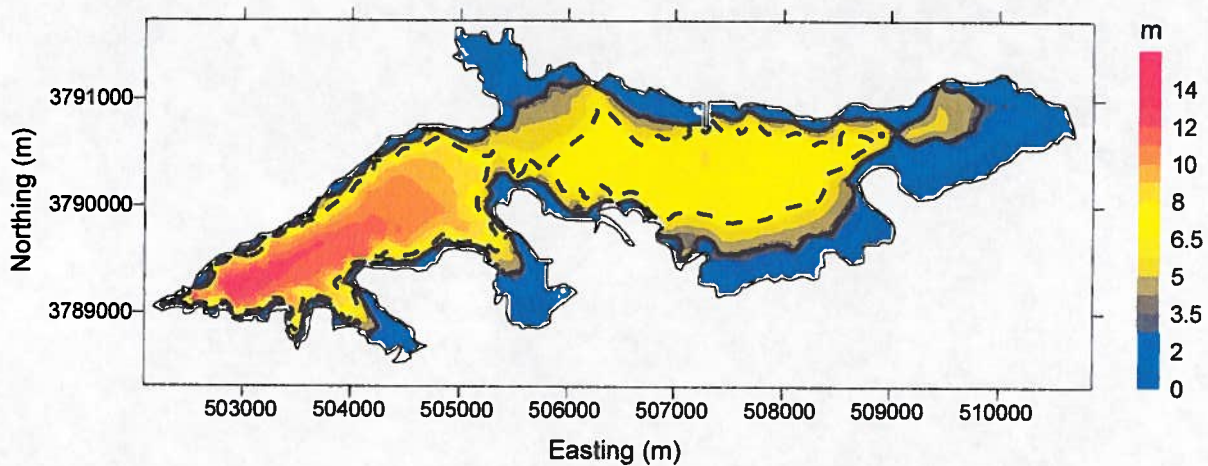


Fig. 7. Region of lake subject to wave resuspension of bottom sediments. Area outside of solid line at 3.5 m depth contour represents region potentially resuspended from typical afternoon winds of 12-14 mph; area outside dashed line at 6.5 m depth contour represents larger region potentially resuspended by periodic windspeeds of 25 mph.

With these constraints in mind, about 420 acres of sediment present in the deeper western portion of lake, with mobile-P concentrations >3.5 g/m², are a logical target for alum treatment (Fig. 8). This region possessed an average mobile-P content of 3.84 g/m², and was thus near 2x higher than the average content for remainder of the lake (2.07 g/m²). Treating this portion of the lake is thus expected to sequester/inactivate more than 35% of the total mobile-P and about 60% of the mobile-P in the lake basin that is amenable to treatment.

Based upon this treatment area, the final step is to establish the appropriate areal dose of Al, subject to any limitations based upon pH. The amount of mobile-P bound per mass of Al has been found to vary, from an Al:P ratio as low as 7 for a highly eutrophic lake with about 9 g/m² mobile-P (Reitzel et al., 2005), to as high as 25-100 (Pilgrim et al., 2007). A lower ratio represents more effective binding of P and lower required dose.

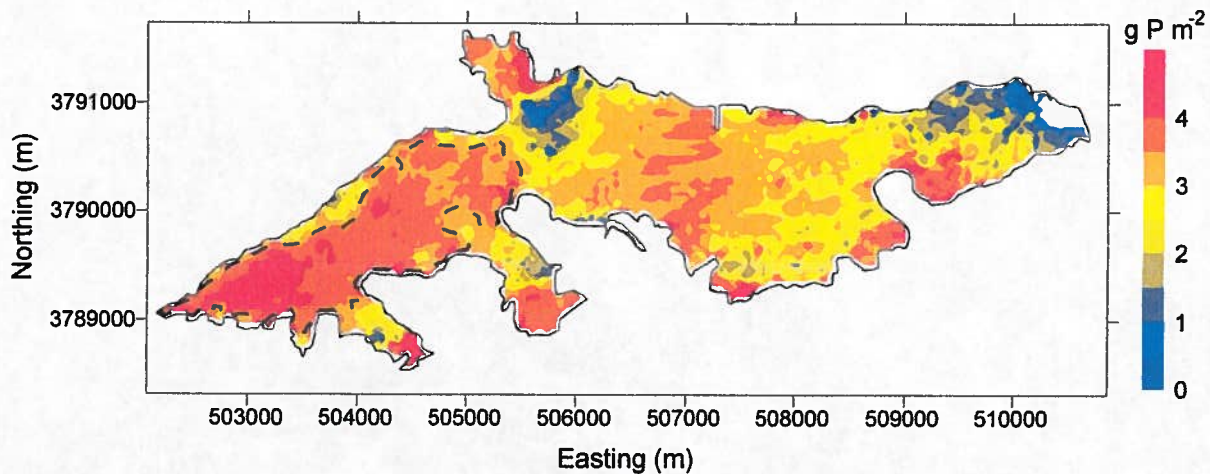


Fig.8. Spatial distribution of mobile-P in Big Bear Lake showing proposed treatment area.

Sorption experiments conducted using alum floc in Big Bear Lake water found Al:P ratios of 15-23 depending upon age of the floc (Berkowitz et al., 2006). A median Al:P ratio of 20:1 was assumed for these calculations, implicitly assuming that much of the binding of mobile-P would be accomplished within 1-2 months following application. The mobile-P values in Fig. 8 were thus simply multiplied by 20 to get the Al dose in g per m² required to sequester this labile form of P within the sediments (Fig. 9).

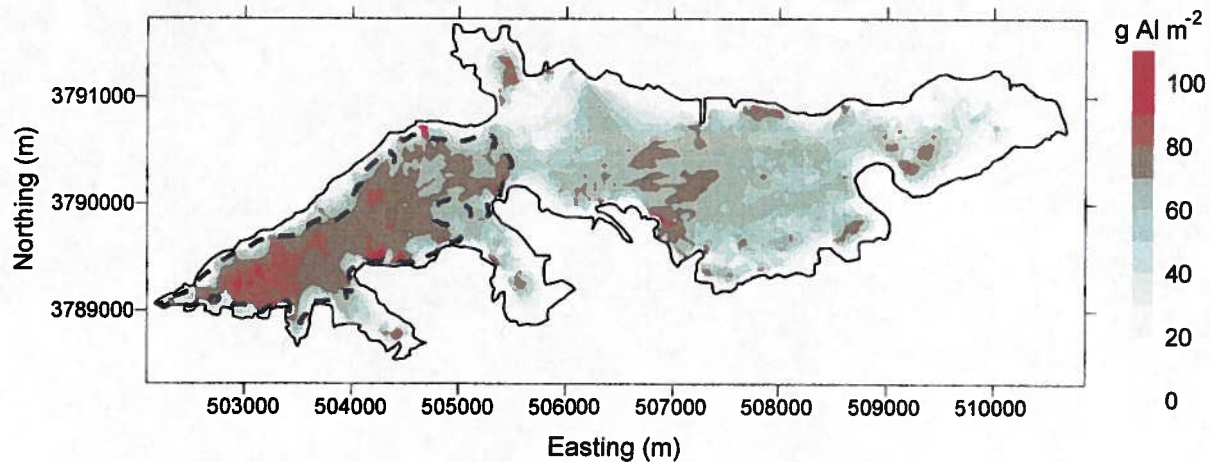


Fig.9. Spatial distribution of Al dose needed to bind mobile-P (assuming 20:1 Al:P ratio).

As one would expect, the highest Al doses would be required at the west end of the lake (Fig. 8), where the highest mobile-P concentrations were found (Fig. 9). Application rates of 70-100 g Al/m² would be needed for this region (average of 77 g Al/m²) which is located at 8-15 m

depth. Assuming the alum is applied in a single application across this region at about 8 m depth, below the thermocline, one estimates a hypolimnetic concentration of 34 mg/L, a value that will exhaust the available alkalinity of the water and drive the pH to unacceptably low levels (Fig. 2). As a result, a near-surface application will be necessary to deliver the prescribed dose of alum to this region of the lake and yield a lower Al concentration (approximately 7.5 mg/L). Based upon Fig. 2, such a dose would result in a short term reduction in pH from about 8.2 to 7, although equilibrium pH is expected to rebound to about 8. Approximately 25% or 0.9 meq/L of alkalinity would be consumed at this dose. Exact material and application costs are not known, but assuming material costs are near \$0.60/gal of liquid alum (delivered), material costs for treatment of 420 acres to an average dose of 77 g Al/m² are estimated to be approximately \$335,000.

Conclusions

Mobile-P concentrations in the sediments of Big Bear Lake have returned to levels comparable to late 2003 and are near 300 µg/g dry-weight in the deeper, western part of the lake. Lower concentrations were found in the eastern portion of the lake that tends to be shallower and also subject to more intense wind- and wave-action. The mobile-P content of sediments was strongly correlated with the fractal dimension of the bottom echo, which allowed use of hydroacoustic measurements to map mobile-P across the lake. Based upon the distribution of mobile-P, wave-theory calculations that delineate regions of potential sediment (and floc) resuspension, and jar test results, a region of approximately 420 acres extending about 3 km out from the dam at the western edge of the lake is thought to be most suited for an alum treatment. A dose of 70-100 g Al/m² will be needed to inactivate the mobile-P in these sediments.

References

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***MINUTES OF A REGULAR MEETING OF
BIG BEAR MUNICIPAL WATER DISTRICT
HELD ON THURSDAY, JUNE 19, 2014***

CALL TO ORDER

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

REPORTS

District Counsel Wayne Lemieux reported that in the closed session meeting on June 5th there was no agreement on the interim General Manager but there was an agreement with Mr. Heule. Mr. Heule had no report. Lake Manager Mike Stephenson reported on lake levels and lake clarity issues. He also reported on lake weeds explaining that this time last year we had received 168 weed calls but as of this date this year we have not received even one weed call. He stated that the harvester will be going out on Monday. He reported that there have been small algae blooms here-and-there but nothing significant. Mr. Stephenson stated that the East Ramp paving started today. He updated on the alum treatment project explaining that we will not be moving forward with the project until we have a compliance date. He added that the MS4 folks won't provide funding without something in writing from the Regional Board. He reported that the 11th Annual Carp Roundup is this weekend. Director Smith asked how the poor water clarity would impact the carp catching. Mr. Stephenson explained that it might be hard to see the fish but if it is not windy it would help with the water clarity.

APPROVAL OF CONSENT CALENDAR

Upon a motion by Director Smith, seconded by Director Eminger, the following consent items were unanimously approved:

- Minutes of a Regular Meeting of June 5, 2014
- Approval of a Special Event Permit for USARC Summer program
- Approval of a Special Event Permit for the Nikolai wedding ceremony

CONSIDER APPROVAL OF FISCAL YEAR 2014-15 Budget

Mr. Heule reported that at the last Board meeting Staff provided a summary of the proposed Fiscal Year 2014-15 Budget. He explained that there were just a few minor changes and the Budget and Finance Committee recommend the Board approve the proposed Fiscal Year 2014-15 Budget as presented and also the Resolutions establishing the Appropriations Limit for Fiscal Year 2014-15 and the Resolution establishing Employee Compensation.

Director Lewis moved approval of Fiscal Year 2014-15 Budget. Director Smith seconded the motion and it was unanimously approved.

CONSIDER APPROVAL OF A PROPOSAL FROM EADIE AND PAYNE, CERTIFIED PUBLIC ACCOUNTANTS, FOR THE COMPLETION OF THE ANNUAL AUDIT FOR THE YEAR ENDED JUNE 30, 2014

Mr. Heule reported that the District received a proposal from Eadie & Payne, Certified Public Accountants, for the current year fiscal year audit. He added that once again they propose providing annual District auditing services and preparing federal and California tax forms for a cost not to exceed \$22,200. He explained that they intend to begin the audit in October and providing Staff supplies the requested items in a timely manner reports should be issued by December 31, 2014. He added that this not to exceed cost of \$22,200 includes the audit and preparing the annual State Controller's Report and has been included in the FY 2014-15 Budget. He explained that the cost for the audit will be paid out of the general fund, Administration-Professional Services portion of the budget.

Director Eminger moved approval of a proposal from Eadie and Payne, Certified Public Accounts, for the completion of the Annual Audit for the year ended June 30, 2014 for an amount not to exceed \$22,200. Director Smith seconded the motion and it was unanimously approved.

DIVISION 3 BOARD VACANCY DISCUSSION

Mr. Heule reported that on May 12, 2014 San Bernardino County election officials were notified of the unscheduled vacancy of the Division 3 Board seat due to the passing of Director Skip Suhay on May 5, 2014. He explained that this notification was made in compliance with Government Code section 1780 adding that the 4 year term of the Division 3 seat expires this year and will be on the ballot for the regular November 4, 2014 election. District Counsel Wayne Lemieux reported that there are 3 options:

- (1) Do nothing until the election in November
- (2) Call a special election explaining that this takes time and the soonest it could take place would be September or October.
- (3) Appoint to fill the vacancy (if no appointment is made, the office would only be vacant until December). He explained that as close as it is to the upcoming November election it would be unusual to appoint.

Director Smith explained that he personally feels the Division 3 voters should be able to choose and he doesn't feel we should spend money on a special election so close to the scheduled election. Director Lewis agreed.

Director Smith moved approval of waiting until the November election to fill the vacancy of the Division 3 Board seat. Director Eminger seconded the motion and it was unanimously approved.

PUBLIC FORUM

No comments were made

ANNOUNCEMENTS

Mr. Heule reported that he gave Mike Stephenson all the District equipment and keys in his possession adding that he will pick up his personal belongings tomorrow.

Director Eminger said that he will miss working with Mr. Heule. Director Smith thanked Mr. Heule for his 7 years of service adding that he hopes CSD is a good move for him. Director Lewis thanked Mr. Heule for all his help and 7 years of service.

ADJOURNMENT TO CLOSED SESSION

The meeting was adjourned to Closed Session at 1:25 P.M to consider:

Govt. Code 54957 Appointment of Interim General Manager

Govt. Code 54356.9(1) (d) – Potential litigation, disclosure of litigants would jeopardize the Districts ability to effectuate service

RECONVENE TO OPEN SESSION

The meeting was reconvened to Open Session at 1:54 P.M.

District Counsel announced Mike Stephenson has been appointed to act as interim General Manager. Counsel also announced negotiations with the City of Big Bear Lake are ongoing.

ADJOURNMENT

There being no further business, the meeting was adjourned at 1:55 P.M.

NEXT MEETING

Open Session at 1:00 P.M.

Thursday, July 3, 2014

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 MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152404	Check	6/10/2014	NAYLOR STEVE & PAM	1001-01 · General Checking Account	
1007	Credit M...	5/29/2014		4990-01 · REV OPS-Invasive Species Mgmt	-160.00
TOTAL					-160.00
152405	Check	6/10/2014	BBLM BIG BEAR LAKE M...	1001-01 · General Checking Account	
1008	Credit M...	5/30/2014		4600-03 · REV OPS - Boat Permits	-9.40
TOTAL					-9.40
152406	Check	6/10/2014	HUMPHREY MARILYN	1001-01 · General Checking Account	
1015	Credit M...	6/3/2014		4990-01 · REV OPS-Invasive Species Mgmt	-160.00
TOTAL					-160.00
152407	Check	6/10/2014	PEARSON DAVID	1001-01 · General Checking Account	
1030	Credit M...	6/11/2014		2800-03 · Boat Storage/RV Deposits	-100.00
TOTAL					-100.00
152408	Liability ...	6/10/2014	LINCOLN NATIONAL	1001-01 · General Checking Account	
				2101-01 · Deferred Compensation	-1,325.00
TOTAL					-1,325.00
152409	Liability ...	6/10/2014	COLONIAL LIFE	1001-01 · General Checking Account	
				2100-17 · Colonial Life - Insure Payable	-77.24
				2100-18 · Colonial Life- Post Tax Payable	-39.02
				2100-19 · Colonial - Pre Tax Payable	-147.06
TOTAL					-263.32
152410	Liability ...	6/10/2014	COLONIAL LIFE	1001-01 · General Checking Account	
				2100-17 · Colonial Life - Insure Payable	-77.24
				2100-18 · Colonial Life- Post Tax Payable	-39.02
				2100-19 · Colonial - Pre Tax Payable	-147.06
TOTAL					-263.32
152411	Liability ...	6/10/2014	INFINITY TRUST (VSP)	1001-01 · General Checking Account	
				2100-09 · PR VSP Vision	-152.66
TOTAL					-152.66
152412	Liability ...	6/10/2014	MID AMERICA APPLE PLAN	1001-01 · General Checking Account	
				2100-21 · Apple Plan - Company Pay	-920.66
				2100-20 · Apple Plan - Employee Pay	-920.66
TOTAL					-1,841.32
152413	Liability ...	6/10/2014	ACWA HEALTH INSURANCE	1001-01 · General Checking Account	
				24000 · Payroll Liabilities	-1,312.00
				24000 · Payroll Liabilities	-575.05
				24000 · Payroll Liabilities	-20,327.65
TOTAL					-22,214.70

Big Bear MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152414	Liability ...	6/10/2014	LINCOLN NATIONAL	1001-01 · General Checking Account	
				2101-01 · Deferred Compensation	-525.00
TOTAL					-525.00
152415	Bill Pmt ...	6/10/2014	ACORN GROUP	1001-01 · General Checking Account	
48102	Bill	5/27/2014		7000-03 · Marsh Mitigation Fund	-10,400.00
TOTAL					-10,400.00
152416	Bill Pmt ...	6/10/2014	ALL PROTECTION ALARM	1001-01 · General Checking Account	
557548	Bill	6/5/2014		5630-43 · OPS-Bldg/Fac Mtn/Rep-WEST RAMP	-94.62
557757	Bill	6/5/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-204.40
557634	Bill	6/5/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-38.21
557384	Bill	6/5/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-43.22
TOTAL					-380.45
152417	Bill Pmt ...	6/10/2014	BARCO PRODUCTS	1001-01 · General Checking Account	
051406...	Bill	5/22/2014		5823-05 · PICNIC TABLES 2014	-7,000.00
				5630-41 · OPS-Bldg/Fac Mtn/Rep-RV PARK	-1,907.68
TOTAL					-8,907.68
152418	Bill Pmt ...	6/10/2014	BAUMGARTNER	1001-01 · General Checking Account	
110971	Bill	5/30/2014		5540-42 · OPS-PreEmployment Physicals	-90.00
TOTAL					-90.00
152419	Bill Pmt ...	6/10/2014	BBLM	1001-01 · General Checking Account	
34	Bill	5/14/2014		5590-42 · OPS-Petroleum-VEHICLES	-1,390.76
35	Bill	5/28/2014		5590-41 · OPS-Petroleum-VESSELS	-2,808.18
36	Bill	6/4/2014		5590-41 · OPS-Petroleum-VESSELS	-1,881.64
TOTAL					-6,080.58
152420	Bill Pmt ...	6/10/2014	BIG BEAR CANVAS CO	1001-01 · General Checking Account	
2400	Bill	5/29/2014		5580-41 · OPS-Boat Maintenance-Patrol	-250.00
TOTAL					-250.00
152421	Bill Pmt ...	6/10/2014	BIG BEAR DISPOSAL	1001-01 · General Checking Account	
8088	Bill	6/1/2014		5507-41 · OPS-Utilities-Main Office	-468.26
TOTAL					-468.26
152422	Bill Pmt ...	6/10/2014	BIG BEAR GRIZZLY	1001-01 · General Checking Account	
060120...	Bill	6/1/2014		5509-03 · ADMIN-Memberships-Subscriptions	-57.00
TOTAL					-57.00
152423	Bill Pmt ...	6/10/2014	BIG BEAR LAKE FIRE PR...	1001-01 · General Checking Account	
14-04J...	Bill	5/21/2014		5570-43 · OPS-OSHA-Training	-1,440.00
TOTAL					-1,440.00

Big Bear MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152424	Bill Pmt ...	6/10/2014	BUTCHER'S BLOCK AND ...	1001-01 · General Checking Account	
300116	Bill	5/23/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-8.21
301739	Bill	5/29/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-67.73
301524	Bill	5/29/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-29.68
301743	Bill	5/29/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-18.32
302102	Bill	5/30/2014		5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-7.15
302717	Bill	6/2/2014		5631-02 · OPS-Quagga Prevention Equip	-9.85
303235	Bill	6/4/2014		5600-31 · MAINT-Vehicle Maint-ON ROAD	-10.99
303706	Bill	6/5/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-9.17
304145	Bill	6/6/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-91.75
304726	Bill	6/9/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-23.18
304920	Bill	6/10/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-10.09
305579	Bill	6/12/2014		5630-43 · OPS-Bldg/Fac Mtn/Rep-WEST RAMP	-20.27
TOTAL					-306.39
152425	Bill Pmt ...	6/10/2014	BVE	1001-01 · General Checking Account	
052720...	Bill	5/27/2014		5507-43 · OPS-Utilities-Ramps	-658.75
052820...	Bill	5/28/2014		5507-22 · WATER-Utilities-Dam	-74.48
052820...	Bill	5/28/2014		5507-41 · OPS-Utilities-Main Office	-11.47
052820...	Bill	5/28/2014		5507-21 · WATER-Utilities-Aerator	-691.66
052820...	Bill	5/28/2014		5507-22 · WATER-Utilities-Dam	-159.60
052820...	Bill	5/28/2014		5507-43 · OPS-Utilities-Ramps	-163.58
060620...	Bill	6/6/2014		5507-42 · OPS-Utilities-RV Park	-761.89
060620...	Bill	6/6/2014		5507-41 · OPS-Utilities-Main Office	-2.85
060620...	Bill	6/6/2014		5507-41 · OPS-Utilities-Main Office	-1,097.50
TOTAL					-3,621.78
152426	Bill Pmt ...	6/10/2014	BVPRINTING	1001-01 · General Checking Account	
85607	Bill	6/17/2014		5510-45 · OPS-Printing Lake Maps	-1,620.00
TOTAL					-1,620.00
152427	Bill Pmt ...	6/10/2014	CALAVERAS TROUT FARM	1001-01 · General Checking Account	
04-2311	Bill	5/15/2014		5670-02 · WATER-Fishery Mgt-FISH PURCHASE	-8,490.00
TOTAL					-8,490.00
152428	Bill Pmt ...	6/10/2014	CASH PETTY CASH	1001-01 · General Checking Account	
061020...	Bill	6/10/2014		5580-41 · OPS-Boat Maintenance-Patrol	-60.98
				5570-01 · ADMIN-Training/Seminars-GM	-19.00
				5570-21 · WATER-Travel Exp Mercury TMDL	-42.00
				5570-43 · OPS-OSHA-Training	-25.45
				5571-06 · ADMIN-Director Meeting/Workshop	-27.05
				5503-01 · ADMIN-Office Supplies-Office	-43.16
				5503-03 · ADMIN-Office Supplies-Meetings	-63.17
TOTAL					-280.81
152429	Bill Pmt ...	6/10/2014	CHARTER COMMUNICATI...	1001-01 · General Checking Account	
052162...	Bill	5/16/2014		5505-08 · ADMIN- Phone Office DSL	-274.99
TOTAL					-274.99
152430	Bill Pmt ...	6/10/2014	CHEM-PAK	1001-01 · General Checking Account	
86417	Bill	5/21/2014		5504-41 · OPS-Janitorial Supplies-Ramps	-322.90
				5504-43 · OPS-Janitorial Supp-SS Reliefs	-322.90
86471	Bill	5/28/2014		5504-41 · OPS-Janitorial Supplies-Ramps	-381.56
86531	Bill	5/30/2014		5504-41 · OPS-Janitorial Supplies-Ramps	-228.81
86632	Bill	6/10/2014		5504-41 · OPS-Janitorial Supplies-Ramps	-171.07
TOTAL					-1,427.24

Big Bear MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152431	Bill Pmt ...	6/10/2014	COMPUTER VILLAGE	1001-01 · General Checking Account	
131786	Bill	5/8/2014		5620-12 · ADMIN-Computer Hardware	-754.92
131821	Bill	5/12/2014		5620-12 · ADMIN-Computer Hardware	-42.12
131963	Bill	5/28/2014		5530-02 · ADMIN-Prof&Spec-ComputerConsult	-700.00
132076	Bill	6/11/2014		5530-02 · ADMIN-Prof&Spec-ComputerConsult	-600.00
TOTAL					-2,097.04
152432	Bill Pmt ...	6/10/2014	COMSERCO	1001-01 · General Checking Account	
69129	Bill	5/21/2014		5506-43 · OPS-Radio Mobiles	-21.73
69169	Bill	5/31/2014		5506-41 · OPS-Radio Service Contract	-330.50
TOTAL					-352.23
152433	Bill Pmt ...	6/10/2014	CONKLIN PAINT	1001-01 · General Checking Account	
20377	Bill	5/1/2014		5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-206.27
20464	Bill	5/23/2014		5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-86.92
TOTAL					-293.19
152434	Bill Pmt ...	6/10/2014	CYGNET	1001-01 · General Checking Account	
6825	Bill	5/28/2014		5660-01 · Aquatic Plant Control Docks	-13,172.83
				5660-02 · Aquatic Plant Control LAKE	-37,701.00
TOTAL					-50,873.83
152435	Bill Pmt ...	6/10/2014	DIRECTV INC	1001-01 · General Checking Account	
232096...	Bill	5/23/2014		5507-42 · OPS-Utilities-RV Park	-199.43
TOTAL					-199.43
152436	Bill Pmt ...	6/10/2014	DISH NETWORK	1001-01 · General Checking Account	
060420...	Bill	6/4/2014		5507-41 · OPS-Utilities-Main Office	-75.00
TOTAL					-75.00
152437	Bill Pmt ...	6/10/2014	DIVERSIFIED MARINE PR...	1001-01 · General Checking Account	
180775...	Bill	6/2/2014		5580-41 · OPS-Boat Maintenance-Patrol	-671.18
180937...	Bill	6/3/2014		5580-41 · OPS-Boat Maintenance-Patrol	-88.81
180980...	Bill	6/4/2014		5580-43 · OPS-Boat Maint-Electro Shock	-147.66
TOTAL					-907.65
152438	Bill Pmt ...	6/10/2014	DIY HOME CENTER	1001-01 · General Checking Account	
13518	Bill	5/28/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-72.89
13579	Bill	5/30/2014		5631-02 · OPS-Quagga Prevention Equip	-20.37
TOTAL					-93.26
152439	Bill Pmt ...	6/10/2014	DWP	1001-01 · General Checking Account	
052120...	Bill	5/21/2014		5507-44 · OPS-Utilities-Trout Pond	-84.24
052920...	Bill	5/29/2014		5507-42 · OPS-Utilities-RV Park	-141.43
052920...	Bill	5/29/2014		5507-41 · OPS-Utilities-Main Office	-15.14
052920...	Bill	5/29/2014		5507-41 · OPS-Utilities-Main Office	-49.90
052920...	Bill	5/29/2014		5507-43 · OPS-Utilities-Ramps	-172.19
052920...	Bill	5/29/2014		5507-43 · OPS-Utilities-Ramps	-20.19
052920...	Bill	5/29/2014		5507-44 · OPS-Utilities-Trout Pond	-83.19
TOTAL					-566.28

Big Bear MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152440	Bill Pmt ...	6/10/2014	EVENSON DON (REIMBU...	1001-01 · General Checking Account	
052120...	Bill	5/21/2014		5570-20 · WATER-Travel Expense Evenson	-529.10
TOTAL					-529.10
152441	Bill Pmt ...	6/10/2014	GRAINGER	1001-01 · General Checking Account	
945830...	Bill	6/4/2014		5640-01 · WATER-Aerator Maint	-1,141.57
TOTAL					-1,141.57
152442	Bill Pmt ...	6/10/2014	HOLLOWAYS MARINA	1001-01 · General Checking Account	
26310	Bill	5/28/2014		5580-41 · OPS-Boat Maintenance-Patrol	-99.32
TOTAL					-99.32
152443	Bill Pmt ...	6/10/2014	KBHR	1001-01 · General Checking Account	
369	Bill	6/2/2014		5510-09 · ADMIN-Public Info - General	-89.00
TOTAL					-89.00
152444	Bill Pmt ...	6/10/2014	LEMIEUX & O'NEILL	1001-01 · General Checking Account	
20-999...	Bill	5/31/2014		5520-01 · ADMIN-District Counsel Retainer	-3,500.00
TOTAL					-3,500.00
152445	Bill Pmt ...	6/10/2014	LITTLE GREEN HOUSE FL...	1001-01 · General Checking Account	
010647	Bill	5/31/2014		5510-09 · ADMIN-Public Info - General	-79.39
TOTAL					-79.39
152446	Bill Pmt ...	6/10/2014	MASTERCARD	1001-01 · General Checking Account	
053020...	Bill	5/30/2014		5505-06 · ADMIN-Phone Cell Phones	-46.56
				5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-637.34
				5630-41 · OPS-Bldg/Fac Mtn/Rep-RV PARK	-296.80
				5510-06 · ADMIN-Public Info-Shore CleanUp	-21.40
				5510-08 · ADMIN-Empl Recognition-End of S	-191.01
				5503-01 · ADMIN-Office Supplies-Office	-432.11
				5506-44 · OPS-Radio Handhelds	-86.42
				5580-41 · OPS-Boat Maintenance-Patrol	-168.31
				5509-03 · ADMIN-Memberships-Subscriptions	-38.84
TOTAL					-1,918.79
152447	Bill Pmt ...	6/10/2014	MCMASTER-CARR	1001-01 · General Checking Account	
864203...	Bill	5/22/2014		5632-01 · MAINT-SS Reliefs/Portables	-547.59
881033...	Bill	6/4/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-30.01
881035...	Bill	6/4/2014		5630-31 · MAINT-Bldg/Facil Maint/Rep-Shop	-10.52
889021...	Bill	6/10/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-37.37
TOTAL					-625.49
152448	Bill Pmt ...	6/10/2014	MERCER AUTOMOTIVE	1001-01 · General Checking Account	
57839	Bill	6/11/2014		5600-32 · MAINT-Vehicle Maint-OFF ROAD	-1,864.78
TOTAL					-1,864.78

Big Bear MWD
Warrant List Detail
 May 29 through June 25, 2014

Num	Type	Date	Name	Account	Paid Amount
152449	Bill Pmt ...	6/10/2014	MOUNTAIN WATER COMP...	1001-01 · General Checking Account	
23906	Bill	5/29/2014		5507-43 · OPS-Utilities-Ramps	-123.00
23874	Bill	5/31/2014		5507-43 · OPS-Utilities-Ramps	-45.55
23983	Bill	6/12/2014		5507-43 · OPS-Utilities-Ramps	-123.00
TOTAL					-291.55
152450	Bill Pmt ...	6/10/2014	NAPA AUTO PARTS	1001-01 · General Checking Account	
189533	Bill	5/19/2014		5580-41 · OPS-Boat Maintenance-Patrol	-7.75
191142	Bill	5/30/2014		5580-41 · OPS-Boat Maintenance-Patrol	-91.59
191522	Bill	6/2/2014		5600-31 · MAINT-Vehicle Maint-ON ROAD	-30.77
192112	Bill	6/6/2014		5600-31 · MAINT-Vehicle Maint-ON ROAD	-80.70
TOTAL					-210.81
152451	Bill Pmt ...	6/10/2014	NO CONTRACT VOIP	1001-01 · General Checking Account	
14151	Bill	6/5/2014		5505-01 · ADMIN-Phones Local/Hardware/Rep	-147.17
TOTAL					-147.17
152452	Bill Pmt ...	6/10/2014	QUILL	1001-01 · General Checking Account	
3089941	Bill	5/20/2014		5503-01 · ADMIN-Office Supplies-Office	-11.87
3409130	Bill	6/3/2014		5503-02 · ADMIN-Office Supplies-Ramps	-72.35
				5503-01 · ADMIN-Office Supplies-Office	-204.78
TOTAL					-289.00
152453	Bill Pmt ...	6/10/2014	RADIOSHACK CORPORAT...	1001-01 · General Checking Account	
036605	Bill	5/27/2014		5630-43 · OPS-Bldg/Fac Mtn/Rep-WEST RAMP	-32.39
012854	Bill	5/29/2014		5630-22 · WATER-Bear Creek Monitoring	-28.06
TOTAL					-60.45
152454	Bill Pmt ...	6/10/2014	ROBERTSON'S	1001-01 · General Checking Account	
351321	Bill	5/21/2014		5630-41 · OPS-Bldg/Fac Mtn/Rep-RV PARK	-112.32
TOTAL					-112.32
152455	Bill Pmt ...	6/10/2014	ROTARY	1001-01 · General Checking Account	
053120...	Bill	5/31/2014		5509-08 · ADMIN-Member/Subs/Permit-Rotary	-190.00
TOTAL					-190.00
152456	Bill Pmt ...	6/10/2014	SQUEEGEE CLEAN WIND...	1001-01 · General Checking Account	
2630-48	Bill	5/28/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-50.00
TOTAL					-50.00
152457	Bill Pmt ...	6/10/2014	STEGMANN SERVICE	1001-01 · General Checking Account	
130814	Bill	5/21/2014		5630-41 · OPS-Bldg/Fac Mtn/Rep-RV PARK	-99.87
TOTAL					-99.87
152458	Bill Pmt ...	6/10/2014	SUN NEWSPAPER	1001-01 · General Checking Account	
562021...	Bill	6/3/2014		5509-03 · ADMIN-Memberships-Subscriptions	-325.00
TOTAL					-325.00

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Num	Type	Date	Name	Account	Paid Amount
152459	Bill Pmt ...	6/10/2014	SUPERMEDIA DEX MEDIA	1001-01 · General Checking Account	
051920...	Bill	5/19/2014		5505-07 · ADMIN-Phone Office Web/Email	-29.95
060120...	Bill	6/1/2014		5505-01 · ADMIN-Phones Local/Hardware/Rep	-67.50
TOTAL					-97.45
152460	Bill Pmt ...	6/10/2014	VALERO	1001-01 · General Checking Account	
052020...	Bill	5/20/2014		5590-42 · OPS-Petroleum-VEHICLES	-1,526.64
TOTAL					-1,526.64
152461	Bill Pmt ...	6/10/2014	VERIZON CALIFORNIA	1001-01 · General Checking Account	
052520...	Bill	5/25/2014		5505-05 · ADMIN-Phone Weather Station	-47.48
052820...	Bill	5/28/2014		5505-04 · ADMIN-Phone At the Dam	-49.00
060120...	Bill	6/1/2014		5505-01 · ADMIN-Phones Local/Hardware/Rep	-381.90
				5505-03 · ADMIN-Phones Long Distance	-46.57
060120...	Bill	6/1/2014		5505-02 · ADMIN-Phones Ramps Local Svc	-65.25
060120...	Bill	6/1/2014		5505-02 · ADMIN-Phones Ramps Local Svc	-53.29
060120...	Bill	6/1/2014		5505-02 · ADMIN-Phones Ramps Local Svc	-59.23
TOTAL					-702.72
152462	Bill Pmt ...	6/10/2014	VERIZON WIRELESS	1001-01 · General Checking Account	
972631...	Bill	6/3/2014		5505-06 · ADMIN-Phone Cell Phones	-76.02
				5505-11 · ADMIN-Phones Ramp Aircards	-62.42
				5505-11 · ADMIN-Phones Ramp Aircards	-62.42
TOTAL					-200.86
152463	Bill Pmt ...	6/10/2014	VILLAGE PLUMBING	1001-01 · General Checking Account	
5087	Bill	5/30/2014		5630-43 · OPS-Bldg/Fac Mtn/Rep-WEST RAMP	-335.00
TOTAL					-335.00
152464	Bill Pmt ...	6/10/2014	XEROX	1001-01 · General Checking Account	
074320...	Bill	6/1/2014		5750-03 · Copier Lease Expense	-469.50
				5620-13 · ADMIN-Copier Maint/Repair	-99.60
TOTAL					-569.10
152465	Liability ...	6/16/2014	MID AMERICA APPLE PLAN	1001-01 · General Checking Account	
				2100-21 · Apple Plan - Company Pay	-683.56
				2100-20 · Apple Plan - Employee Pay	-683.56
TOTAL					-1,367.12
152466	Bill Pmt ...	6/16/2014	MASTERCARD	1001-01 · General Checking Account	
053020...	Bill	5/30/2014		5570-01 · ADMIN-Training/Seminars-GM	-16.39
				5570-01 · ADMIN-Training/Seminars-GM	-7.00
				5570-01 · ADMIN-Training/Seminars-GM	-22.52
				5570-01 · ADMIN-Training/Seminars-GM	-36.99
				5570-01 · ADMIN-Training/Seminars-GM	-11.10
				5590-42 · OPS-Petroleum-VEHICLES	-52.09
				5590-42 · OPS-Petroleum-VEHICLES	-47.24
				5570-01 · ADMIN-Training/Seminars-GM	-893.44
				5510-05 · ADMIN-Public Info-Other Agency	-99.69
				5570-21 · WATER-Travel Exp Mercury TMDL	-25.98
				5570-21 · WATER-Travel Exp Mercury TMDL	-37.50
				5570-21 · WATER-Travel Exp Mercury TMDL	-18.00
				5570-21 · WATER-Travel Exp Mercury TMDL	-37.27
				5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-275.00
				5570-01 · ADMIN-Training/Seminars-GM	-49.85

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<u>Num</u>	<u>Type</u>	<u>Date</u>	<u>Name</u>	<u>Account</u>	<u>Paid Amount</u>
				5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-41.70
				5570-01 · ADMIN-Training/Seminars-GM	-25.00
				5570-01 · ADMIN-Training/Seminars-GM	-290.50
				5570-03 · ADMIN-Training/Seminars-Empl	-125.00
				5509-09 · ADMIN-Member/Subs/ QBE & Scribb	-506.52
				5503-01 · ADMIN-Office Supplies-Office	-53.52
TOTAL					-2,672.30
152467	Bill Pmt ...	6/18/2014	UR BRIGHT PROP REPAIR	1001-01 · General Checking Account	
0368	Bill	5/27/2014		5580-41 · OPS-Boat Maintenance-Patrol	-55.00
0391	Bill	6/12/2014		5580-41 · OPS-Boat Maintenance-Patrol	-55.00
TOTAL					-110.00
152468	Check	6/22/2014	HAMMAN HOSS	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-500.00
TOTAL					-500.00
152469	Check	6/22/2014	ROZEN BRYAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-500.00
TOTAL					-500.00
152470	Check	6/22/2014	ASHBAUGH FRANCIS (JA...	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-250.00
TOTAL					-250.00
152471	Check	6/22/2014	RONEY DARICK	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-250.00
TOTAL					-250.00
152472	Check	6/22/2014	SHERRILL NICHOLAS	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-150.00
TOTAL					-150.00
152473	Check	6/22/2014	SHIELDS ALEX	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-150.00
TOTAL					-150.00
152474	Check	6/22/2014	FOOTE BRYAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-500.00
TOTAL					-500.00
152475	Check	6/22/2014	TAGLIONE SCOTT	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-500.00
TOTAL					-500.00
152476	Check	6/22/2014	OWENS DELL	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-250.00
TOTAL					-250.00

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152477	Check	6/22/2014	LINNE DEAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-250.00
TOTAL					-250.00
152478	Check	6/22/2014	ESTERLEIN RYAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-150.00
TOTAL					-150.00
152479	Check	6/22/2014	BOURGEOIS ROD	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-150.00
TOTAL					-150.00
152480	Check	6/22/2014	LINNE DEAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-200.00
TOTAL					-200.00
152481	Check	6/22/2014	HAMMAN HOSS	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-200.00
TOTAL					-200.00
152482	Check	6/22/2014	MCNEILL JOHN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-100.00
TOTAL					-100.00
152483	Check	6/22/2014	MILROY TY	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-100.00
TOTAL					-100.00
152484	Check	6/22/2014	LANOUE BLAKE	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-100.00
TOTAL					-100.00
152495	Check	6/22/2014	JACOBS DANIEL	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-500.00
TOTAL					-500.00
152496	Check	6/22/2014	LINNE DEAN	1001-01 · General Checking Account	
				2810-02 · Carp Round-Up	-520.00
TOTAL					-520.00
152497	Liability ...	6/24/2014	EMPLOYMENT DEVELOP...	1001-01 · General Checking Account	
				2101-03 · State Unemployment Tax	-4,760.22
TOTAL					-4,760.22

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Num	Type	Date	Name	Account	Paid Amount
152498	Bill Pmt ...	6/24/2014	ALLIGARE	1001-01 · General Checking Account	
29116	Bill	6/4/2014		5660-01 · Aquatic Plant Control Docks	-7,557.07
29264	Bill	6/24/2014		5660-01 · Aquatic Plant Control Docks	-15,114.13
TOTAL					-22,671.20
152499	Bill Pmt ...	6/24/2014	BBLM	1001-01 · General Checking Account	
37	Bill	6/11/2014		5590-41 · OPS-Petroleum-VESSELS	-1,448.76
TOTAL					-1,448.76
152500	Bill Pmt ...	6/24/2014	BEAR VALLEY HOSPITAL	1001-01 · General Checking Account	
100160...	Bill	6/12/2014		5540-42 · OPS-PreEmployment Physicals	-93.50
				5540-02 · ADMIN-PreEmployment Physicals	-93.50
TOTAL					-187.00
152501	Bill Pmt ...	6/24/2014	BIG BEAR SHEET METAL	1001-01 · General Checking Account	
4366	Bill	6/10/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-200.78
TOTAL					-200.78
152502	Bill Pmt ...	6/24/2014	BIG BEAR TODAY	1001-01 · General Checking Account	
755974	Bill	5/30/2014		5631-06 · OPS-Quagga Notices/Ads	-700.00
TOTAL					-700.00
152503	Bill Pmt ...	6/24/2014	BUTCHER'S BLOCK AND ...	1001-01 · General Checking Account	
304941	Bill	6/10/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-9.89
306018	Bill	6/13/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-379.98
306503	Bill	6/16/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-11.66
306820	Bill	6/17/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-39.24
307696	Bill	6/19/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-41.55
307904	Bill	6/20/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-26.61
TOTAL					-508.93
152504	Bill Pmt ...	6/24/2014	BVE	1001-01 · General Checking Account	
061020...	Bill	6/10/2014		5507-44 · OPS-Utilities-Trout Pond	-27.21
TOTAL					-27.21
152505	Bill Pmt ...	6/24/2014	CALAVERAS TROUT FARM	1001-01 · General Checking Account	
04-2329	Bill	6/12/2014		5670-02 · WATER-Fishery Mgt-FISH PURCHASE	-8,041.00
				2810-01 · Fish Plant Funds	-449.00
TOTAL					-8,490.00
152506	Bill Pmt ...	6/24/2014	CASH PETTY CASH	1001-01 · General Checking Account	
062420...	Bill	6/24/2014		5670-05 · WATER-Carp Roundup Expense	-65.61
				5631-01 · OPS-Quagga Mussel Prevention	-11.96
				5571-06 · ADMIN-Director Meeting/Workshop	-13.15
				5503-03 · ADMIN-Office Supplies-Meetings	-80.95
TOTAL					-171.67
152507	Bill Pmt ...	6/24/2014	CHARTER COMMUNICATI...	1001-01 · General Checking Account	
061620...	Bill	6/16/2014		5505-08 · ADMIN- Phone Office DSL	-274.99
TOTAL					-274.99

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<u>Num</u>	<u>Type</u>	<u>Date</u>	<u>Name</u>	<u>Account</u>	<u>Paid Amount</u>
152508	Bill Pmt ...	6/24/2014	CHEM-PAK	1001-01 · General Checking Account	
86732	Bill	6/16/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-23.28
TOTAL					-23.28
152509	Bill Pmt ...	6/24/2014	CONNEY SAFETY	1001-01 · General Checking Account	
047039...	Bill	6/9/2014		5570-41 · OPS-OSHA-Equipment	-222.90
TOTAL					-222.90
152510	Bill Pmt ...	6/24/2014	CSB SOLID WASTE MANA...	1001-01 · General Checking Account	
029716	Bill	6/13/2014		5630-30 · MAINT-Bldg/Facility Maint/Rep	-293.57
TOTAL					-293.57
152511	Bill Pmt ...	6/24/2014	HAVASU EMBROIDERY INC	1001-01 · General Checking Account	
17787	Bill	6/16/2014		5670-05 · WATER-Carp Roundup Expense	-1,674.00
TOTAL					-1,674.00
152512	Bill Pmt ...	6/24/2014	LUDECKE ELECTRICAL S...	1001-01 · General Checking Account	
8598	Bill	6/16/2014		5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-398.00
TOTAL					-398.00
152513	Bill Pmt ...	6/24/2014	MELTON SIGN SERVICE	1001-01 · General Checking Account	
4390	Bill	6/19/2014		5630-42 · OPS-Bldg/Fac Mtn/Rep-EAST RAMP	-350.00
TOTAL					-350.00
152514	Bill Pmt ...	6/24/2014	MHP	1001-01 · General Checking Account	
MH2144	Bill	6/10/2014		5600-33 · MAINT-Vehicle Maint-HARVESTER	-710.10
MH214...	Bill	6/19/2014		5600-33 · MAINT-Vehicle Maint-HARVESTER	-832.10
TOTAL					-1,542.20
152515	Bill Pmt ...	6/24/2014	MOUNTAIN WATER COMP...	1001-01 · General Checking Account	
24023	Bill	6/17/2014		5507-43 · OPS-Utilities-Ramps	-113.00
TOTAL					-113.00
152516	Bill Pmt ...	6/24/2014	MWH	1001-01 · General Checking Account	
1652729	Bill	6/10/2014		6100-06 · Dam Repair-Gen Engineering	-332.76
TOTAL					-332.76
152517	Bill Pmt ...	6/24/2014	NAPA AUTO PARTS	1001-01 · General Checking Account	
188773	Bill	5/12/2014		5580-41 · OPS-Boat Maintenance-Patrol	-35.85
193100	Bill	6/13/2014		5600-31 · MAINT-Vehicle Maint-ON ROAD	-28.68
193139	Bill	6/13/2014		5590-42 · OPS-Petroleum-VEHICLES	-50.62
193538	Bill	6/17/2014		5640-02 · WATER-Dam Maintenance	-10.83
193580	Bill	6/17/2014		5580-40 · OPS-Boat Maintenance	-12.71
193705	Bill	6/18/2014		5600-31 · MAINT-Vehicle Maint-ON ROAD	-37.20
TOTAL					-175.89

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Num	Type	Date	Name	Account	Paid Amount
152518	Bill Pmt ...	6/24/2014	NORTHERN TOOL BLUE T...	1001-01 · General Checking Account	
207709...	Bill	6/13/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-1,168.47
208388...	Bill	6/19/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-674.65
208897...	Bill	6/24/2014		5543-30 · MAINT-Small Tools/Tool Supplies	-167.81
TOTAL					-2,010.93
152519	Bill Pmt ...	6/24/2014	PORTERS FIREWOOD	1001-01 · General Checking Account	
14898	Bill	6/13/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep 5630-41 · OPS-Bldg/Fac Mtn/Rep-RV PARK	-2,200.00 -2,200.00
TOTAL					-4,400.00
152520	Bill Pmt ...	6/24/2014	QUILL	1001-01 · General Checking Account	
3493245	Bill	6/4/2014		5503-01 · ADMIN-Office Supplies-Office	-9.43
3454357	Bill	6/4/2014		5503-01 · ADMIN-Office Supplies-Office	-262.28
3544280	Bill	6/4/2014		5503-01 · ADMIN-Office Supplies-Office	-76.58
3488135	Bill	6/5/2014		5503-01 · ADMIN-Office Supplies-Office	-129.17
TOTAL					-477.46
152521	Bill Pmt ...	6/24/2014	ROBERTSON'S	1001-01 · General Checking Account	
365510	Bill	6/16/2014		5630-10 · ADMIN-Bldg/Facility Maint/Rep	-41.04
TOTAL					-41.04
152522	Bill Pmt ...	6/24/2014	SOUTHWEST GAS CORP...	1001-01 · General Checking Account	
061720...	Bill	6/17/2014		5507-41 · OPS-Utilities-Main Office	-12.33
061720...	Bill	6/17/2014		5507-42 · OPS-Utilities-RV Park	-24.28
061820...	Bill	6/18/2014		5507-44 · OPS-Utilities-Trout Pond	-10.64
TOTAL					-47.25
152523	Bill Pmt ...	6/24/2014	TOM DODSON & ASSOCIA...	1001-01 · General Checking Account	
BB-165-3	Bill	6/19/2014		2820-01 · Giebelhouse Dredge Deposit 2014	-8,880.00
TOTAL					-8,880.00
152524	Bill Pmt ...	6/24/2014	UC REGENTS UC RIVERSI...	1001-01 · General Checking Account	
20778-...	Bill	6/12/2014		6000-14 · Lake Impr - Alum Treatment	-10,000.00
TOTAL					-10,000.00
152525	Bill Pmt ...	6/24/2014	UPS	1001-01 · General Checking Account	
F33Y11...	Bill	6/14/2014		5501-01 · ADMIN-Post&Ship OFFICE	-39.32
TOTAL					-39.32
152526	Bill Pmt ...	6/24/2014	VALERO	1001-01 · General Checking Account	
062020...	Bill	6/20/2014		5590-42 · OPS-Petroleum-VEHICLES 5631-03 · OPS-Quagga Prent Disel/Kerosine	-2,851.11 -107.57
TOTAL					-2,958.68
152527	Bill Pmt ...	6/24/2014	VERIZON CALIFORNIA	1001-01 · General Checking Account	
061320...	Bill	6/13/2014		5505-01 · ADMIN-Phones Local/Hardware/Rep	-55.67
TOTAL					-55.67

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<u>Num</u>	<u>Type</u>	<u>Date</u>	<u>Name</u>	<u>Account</u>	<u>Paid Amount</u>
152528	Bill Pmt ...	6/24/2014	VERIZON WIRELESS	1001-01 · General Checking Account	
972663...	Bill	6/9/2014		5505-06 · ADMIN-Phone Cell Phones	-163.81
TOTAL					-163.81
152529	Bill Pmt ...	6/24/2014	VOLVO PENTA OF THE A...	1001-01 · General Checking Account	
345718	Bill	6/17/2014		5580-41 · OPS-Boat Maintenance-Patrol	-539.40
TOTAL					-539.40