2007 LAKE LAS VEGAS WATER QUALITY MONITORING REPORT

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I. INTRODUCTION

A. Project History

J. Carlton Adair, then President of the Port Holiday Authority conceived the idea of Lake Las Vegas in 1964. The 2243-acre development project was known as Port Holiday, and the lake was called "Lake Adair." Project land was acquired from the federal government under a land exchange act (PL88-639) authorized by Congress on October 8, 1964. Approximately 170 acres of privately owned land in the Lake Mead National Recreation Area (LMNRA) was exchanged for 2,243 acres in Las Vegas Wash (LVW). That property was located along the western border of the LMNRA in the LVW (Figure 1).

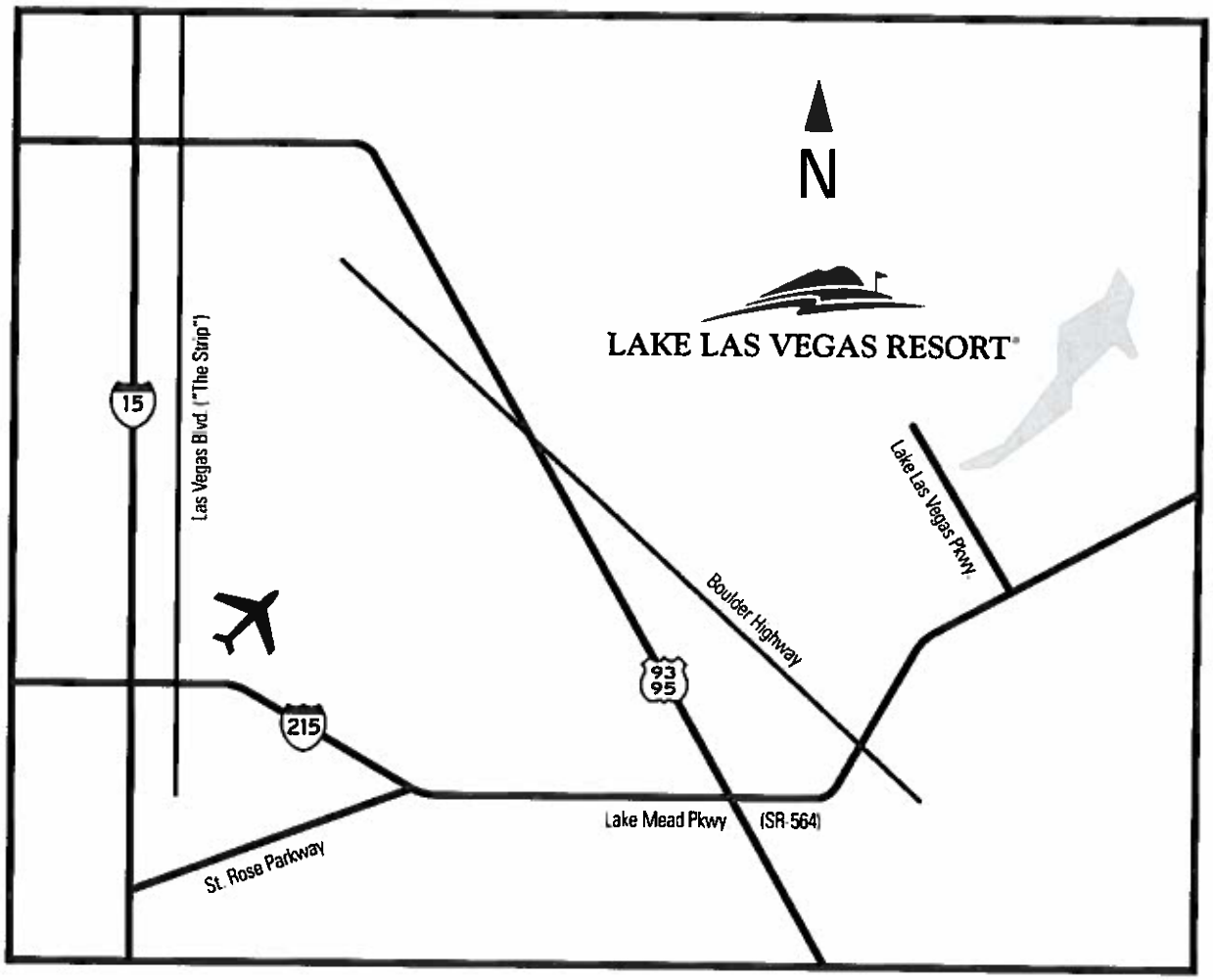
Carlton Adair halted the project in 1971, though a considerable amount of engineering and feasibility work had been done. The project remained idle until 1982 when it was reinitiated as the Lake at Las Vegas Project by Barry Silverton and the Pacific Malibu Development Corporation of Los Angeles, CA. Pacific Malibu and its prime consultant J. M. Montgomery (JMM) Consulting Engineers conducted extensive engineering and environmental studies during 1984-1987. Transcontinental Corporation of Santa Barbara, California, acquired controlling interest in the project in 1988. Transcontinental Corporation and its consultants completed the engineering and environmental studies and obtained the necessary local, state, and federal permits required to start construction of the project. Construction began on April 1, 1989. The project is now called "Lake Las Vegas Resort."

B. Project Description

The focal point of the project is a 320-acre recreational lake that is developed behind a 4800-ft., S-shaped earthen dam, 1500 ft. upstream of North Shore Road. The 190-ft. high dam was constructed with 3.0 million cubic yards of locally available materials. Lake elevation is maintained between 1401.85 ft. and 1404.85 ft. (NAVD 88). At an elevation of 1404.85 ft., the Lake has a storage capacity of approximately 10,000 acre feet, comprises 320 surface acres, a two mile length, a one mile width, and 12.3 miles of shoreline. Lake fill water is drawn from Lake Mead, and conveyed by the Basic Management Incorporated Pipeline (BMI). Approximately 7,000 – 9,000 acre-feet are required annually for project irrigation, seepage, evaporative losses from the lake.

Las Vegas Wash flows are by-passed under the lake through two 84-inch diameter reinforced concrete pipelines. The bypass system is 9,450 ft. in length and designed to pass Las Vegas Wash (LVW) flows up to approximately 1,200 cubic feet per second (cfs).

Figure 1. **Location of Lake Las Vegas Resort, Clark County, Nevada**



II. METHODS

The revised Clark County 208 Water Management Plan was approved by the Clark County Board of County Commissioners on April 5, 1988 and certified by the State of Nevada on August 8, 1988. This plan required a water quality-monitoring program be developed for the reservoir at Lake Las Vegas Resort. The monitoring was required to insure that construction activities and operations of the reservoir did not violate the Las Vegas Wash water quality standards. The water quality-monitoring program was initiated in June 1991, and Lake Las Vegas has submitted annual reports to Nevada Division of Environmental Protection for review.

A. Lake Las Vegas Monitoring Sites

Since 1991, water quality monitoring was conducted on Lake Las Vegas monthly in January, February, November, and December, biweekly during March and October, and weekly during April through September. Beginning in 2008, the water sampling protocol has been changed to monthly sampling. The new protocol was submitted to and approved by the Nevada Division of Environmental Protection.

Water quality monitoring was conducted at sites shown in Figure 2, at fixed points along the historical center channel in the deepest part of the Lake.

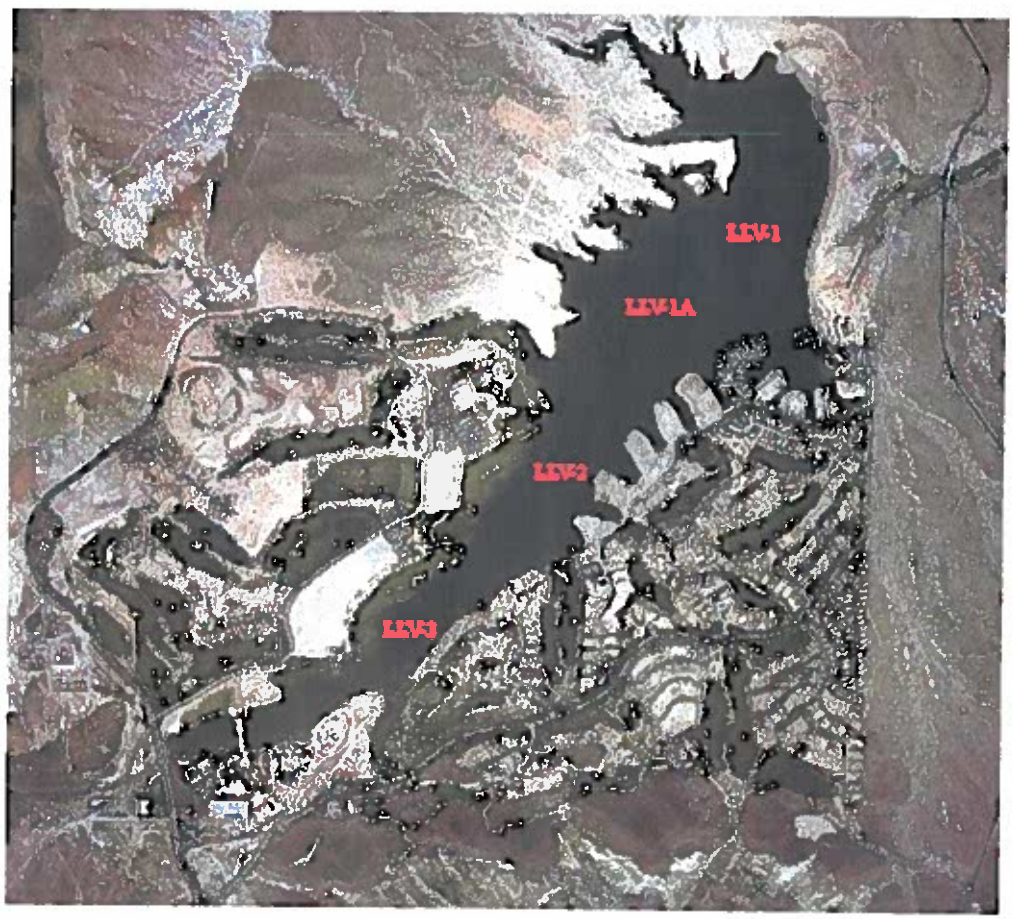


Figure 2. **Location of water quality monitoring stations at Lake Las Vegas.**

B. Field Measurements

Temperature, dissolved oxygen, pH, and specific conductance were measured throughout the vertical column at all sites with a Hydrolab Surveyor Model 4 a Water Quality Analyzer or an YSI Water Quality Analyzer (Table 1). Transparency was measured at each lake site with a Secchi disc. Duplicate measurements were made on approximately 10% of the measurements.

Table 1. **2007 Lake Las Vegas physical, chemical and biological analyses.**

Sampling Program			
Measurements	Depth(s)	Frequency	Method(s)
Physical			
Temperature (°C)	1.0 m Intervals Surface to Bottom	Variable	Electronic Multimeter
Dissolved Oxygen (mg/L)	"	"	"
pH (Std. Units)	"	"	"
Conductivity (µmhos/cm)	"	"	"
Secchi Depth (m)	Surface	"	"
Turbidity (NTU)	0 - 2.5 m Integrated	"	EPA 180.1
Chemical			
Total Nitrogen (µg/L)	0 - 2.5 m Integrated	"	APHA (1995)
Amrnonia-N (µg/L)	"	"	EPA 350.2
Total Kjeldehl Nitrogen (µg/L)	"	"	EPA 351.3
Total Phosphorus (µg/L)	"	"	EPA 365.2
Ortho-Phosphorus (µg/L)	"	"	EPA 365.2
Total Suspended Solids (mg/L)	"	"	EPA 160.1
Total Dissolved Solids (mg/L)	"	"	EPA 160.2
Major Anions/Cations (mg/L)	"	"	EPA 200.7
Sulfate (mg/L)	"	"	EPA 375.4
BOD 5 (mg/L)	"	"	EPA 405.1
Biological			
Chlorophyll-a (µg/L)	"	"	Janik
Phytoplankton Counts (mg/m^3)	"	"	"
Zooplankton Counts (#/m^3)	0 - 15 m Net Tow	"	"
Fecal Coliform (MPN/100ml)	"	"	"

C. Chemical and Biological Analysis

Depth integrated water samples were collected from 0-2.5 m at main-lake sampling sites (Figure 2). Additional depth samples were also collected quarterly at 5 m, 10 m, and 20 m at site LLV-1A with a Van Dorn sampler. Samples requiring filtration were filtered through 0.45 µm millipore filters.

Analyses were run on field duplicates at a frequency of approximately 10% of the samples. A State of Nevada certified laboratory analyzed the chemical and biological analyses with EPA-approved methods. Samples were collected from the surface and near the bottom at site LLV-1A in December 2007 for analysis of toxic substances.

Monthly Zooplankton samples were collected at LLV-1 in a vertical tow from 0-15 m with an 80 µm Wisconsin plankton net. Phytoplankton (algae) was collected quarterly from the surface (0-2.5 m) from site LLV-1. Phytoplankton samples were identified and enumerated to the level of species when possible.

Phytoplankton

Utermohl Method

The inverted-microscope method or Utermohl method (Utermohl 1958, Kellar et al. 1980, Janik 1984) is used for enumeration and identification of phytoplankton samples.

Counting Procedure:

The procedure incorporates a stratified design using at least three (x 78, 280, 560) magnifications (Janik 1984). The rational for this approach is that phytoplankton in most lakes have greatest axial linear dimension (GALD) than spans three orders of magnitude from 1-2 µm to 1000 µm or more for filamentous taxa.

Sample Sedimentation:

Wild™ and Hydro-Bios™ combined plate chambers consisting of a top cylinder (Sedimentation cylinder) of 10 mL capacity and a bottom-plate chamber (base plate) are used. The bottom diameter of the base chamber is 25.5 mm. Volumes sedimented range from 2.0 – 10.0 mL depending of algal density.

Biovolumes:

Cell volumes are calculated based on the measurements of at least 20 individuals of each species and the geometrical formulae which most closely approximates the cell shape (Lund et al. 1958). Cell sizes are measured at x 560 with a calibrated ocular micrometer. For most organisms the measurements are taken from outside cell wall to outside cell wall.

Zooplankton

Samples are analyzed with a Wild M40 inverted phase contrast microscope (Wetzel and Likens 1979). Samples will be counted at: x 78. Higher magnification of x 280 and 560 are available to facilitate identifications.

Sample Preparation and Counting Procedure

The zooplankton sample is mixed by gently inverting the sample bottle for 30 seconds. A wide-bore automatic pipette is used to withdraw 2.9 mL of sample and fill a Hydro-Bios combination plate chamber.

A cover slip is then placed on top of the chamber and allowed to settle for 15 minutes before counting. A second chamber is then prepared for a total of 5.8 mL for each sample. The entire 510 mm^2 plate chamber is counted in continuous strips.

D. Statistical Analysis

Statistical analysis was performed using Jandels Sigma Stat Analytical software. All data sets were tested for normality and heterogeneity. Data sets were analyzed using appropriate non-parametric statistical tests for non-normal distributed data. Statistical significance was defined at an alpha of < 0.05 unless otherwise noted.

E. Water Quality Guidelines

The water quality guidelines presented in table 2 are patterned after standards established for Lake Mead (NAC 445.1351). These guidelines were established and adapted as part of the Clark County 208 Amendment to protect and enhance the following beneficial uses at Lake Las Vegas:

1) Irrigation
2) Recreation not involving contact with the water (boating, sailing, canoeing);
3) Recreation involving contact with the water (swimming, bathing, diving);
4) Propagation of wildlife; and
5) Propagation of aquatic life, including a warm water fishery

Table 2. **Water quality guidelines for Lake Las Vegas**

1. The lake waters should be free of:
   a. Visible floating, suspended, or settleable solids,
   b. Sludge banks, lime infestations, heavy growths of attached plants (Periphyton) and animals, or of floating algae mats,
   c. Discoloration or excessive turbidity,
   d. Visible oil or slicks,
   e. Surfactant concentrations that produce foam when water is agitated or aerated,
   f. Toxicants in toxic amounts;
2. The pH as measured in standard units should range between 7.0 and 9.0 in 90% of the measurements.
3. Dissolved oxygen concentrations should be 5 mg/L in the epilimnion during stratification, and 5mg/L through out the water column the rest of the year.
4. The average chlorophyll-a concentration in the epilimnion (0-2.5 m) should not exceed 0.005 mg/L during April through September. The average must include at least two samples per month. The single value must not exceed .010 mg/L in 10% of the samples.
5. In all lake areas, the log mean of not less than five fecal coliform samples taken over a 30 day period during the recreational season (April-September) should not exceed 200 MPN/100 ml and not over 10% of such samples should exceed 400 MPN/100;
6. Average temperature in the epilimnion should not exceed 2°C above ambient temperature (e.g. temperature in epilimnion in Lake Mead;
7. Total dissolved solids concentrations should not exceed an annual average of 2000 mg/L throughout the water column;
8. Turbidity must not exceed that characteristic of natural conditions by more than 10 NTU.

III. WATER QUALITY RESULTS

A. Lake Water Surface Elevation

Water for Lake Las Vegas is pumped from the hypolimnion of Lake Mead through the Basic Management Incorporated (BMI) pipelines. Lake Las Vegas; Lake Mead inflows totaled two thousand five hundred thirty-eight (2,538) acre-feet during 2007 (Figure 3). Two thousand two hundred thirty-two (2,232) acre-feet of lake water were lost to seepage/evaporation.

In 2007, approximately two thousand two hundred sixty-eight (2,268) acre-feet of storm water discharged into the lake. Additionally, Lake Las Vegas released approximately nine hundred sixty-eight (968) acre-feet through the dam's appurtenance, back to the Las Vegas Wash.

There was a 0.74 foot increase in lake elevation in 2007. Elevations are referenced to NAVD88.

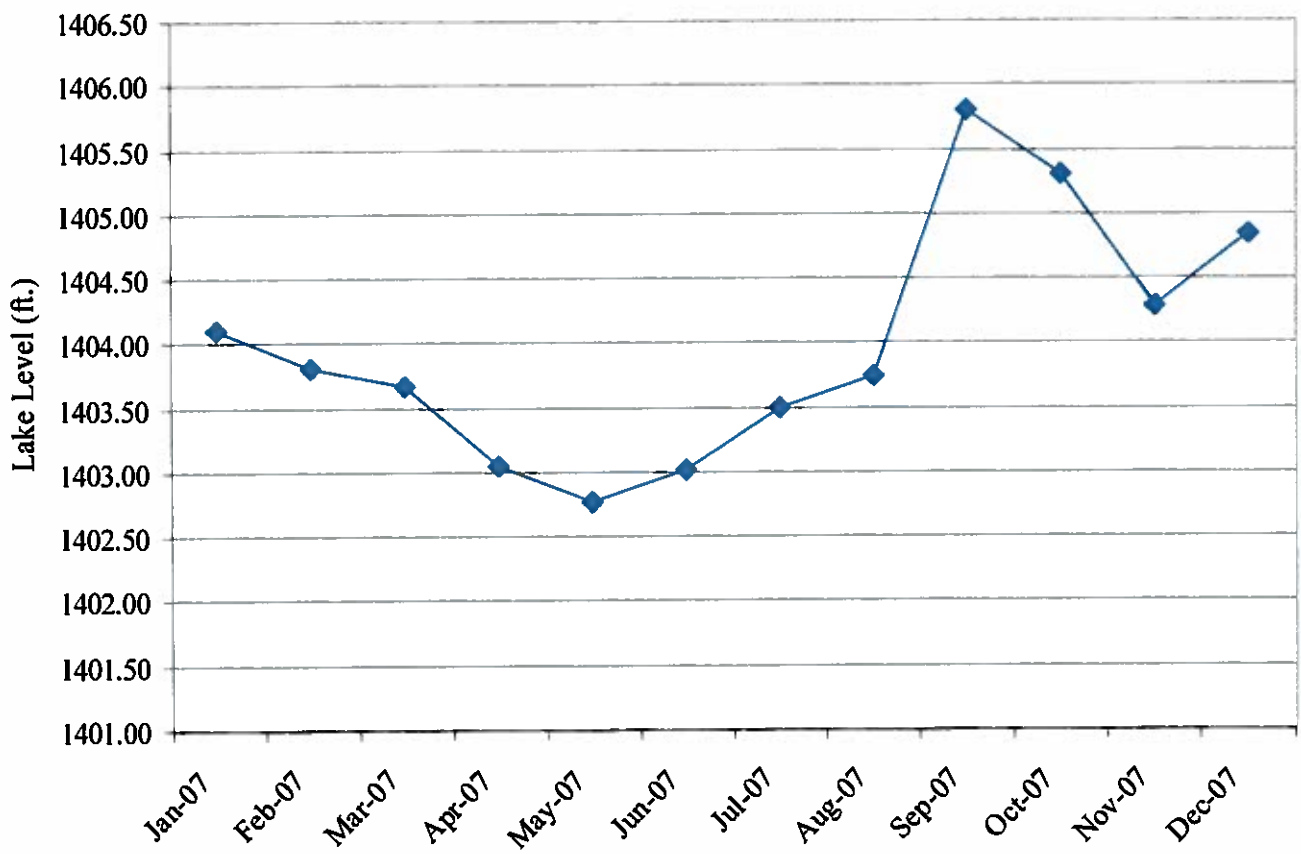


Figure 3. **2007 Lake Las Vegas Surface elevations.**

Table 3. **2007 Storm water inflow and outflow of Lake Las Vegas.**

Date	Inflow (AF)	Outflow Net (AF)	Recovery (AF)
8/27/07	1,274	576	698
9/22/07	513	0	513
9/28/07	135	392	-257
11/30/07	346	0	346
Total	**2,268**	**968**	**1,300**

B. Physical Analysis

Temperature

Surface temperatures in Lake Las Vegas ranged from 6.5°C to 30.2°C during 2007, with the lowest temperatures found in January and the highest in August (Figure 4). The Lake was uniformly mixed top to bottom during December, but reflected various stages of thermal stratification during the remaining quarters through early spring. The Lake remained stratified during the summer and early fall months (Table 4).

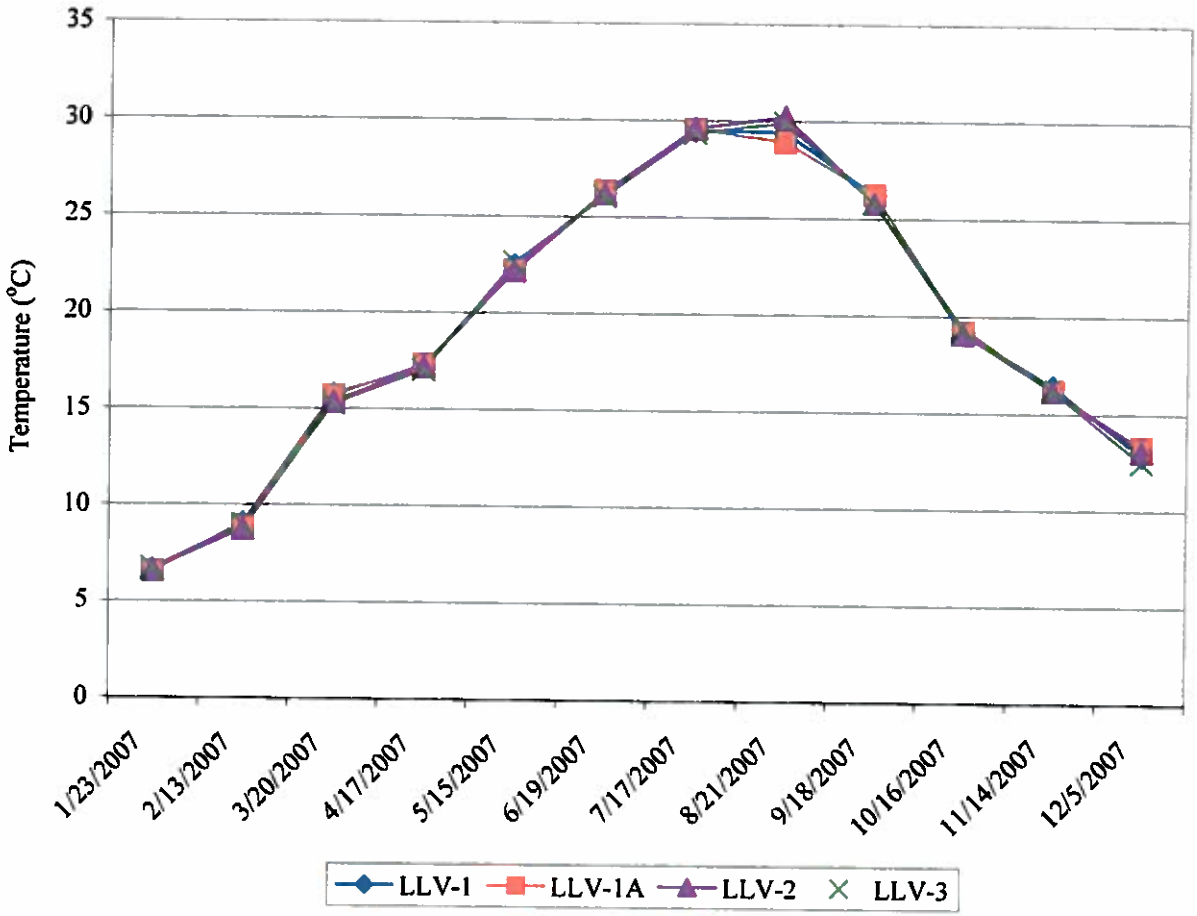


Figure 4. **Lake Las Vegas surface temperature (°C) measurements at Lake monitoring stations in 2007.**

Table 4. **Lake Las Vegas temperature (°C) profiles at Lake monitoring station LLV-1A during March, June, September, and December 2007.**

Depth (m)	3/20/2007	6/19/2007	9/18/2007	12/5/2007
0	15.64	26.33	26.2	13.3
2	15.58	26.02	25.6	12.28
4	15.34	25.64	25.5	12.19
6	12.82	24.06	25.5	12.17
8	11.75	21.51	25.4	12.16
10	10.82	19.73	25	12.16
12	10.47	16.52	20.7	12.13
14	10.37	14.84	17.4	12.13
16	10.14	13.63	15.3	12.11
18	9.99	12.84	14.3	12.1
20	9.98	12.55	13.7	12.09
22	9.95	12.48	13.7	12.05
24	9.92	12.5	13.8	12.04

Dissolved Oxygen

Dissolved oxygen concentrations at the lake surface did not have considerable variations between the sites throughout the year (Figure 5). Concentration ranged from approximately 4.15 to 11.95 mg/L. Concentrations at depth exhibited the common dissolved oxygen trends found within monomictic lakes that stratify (Table 5).

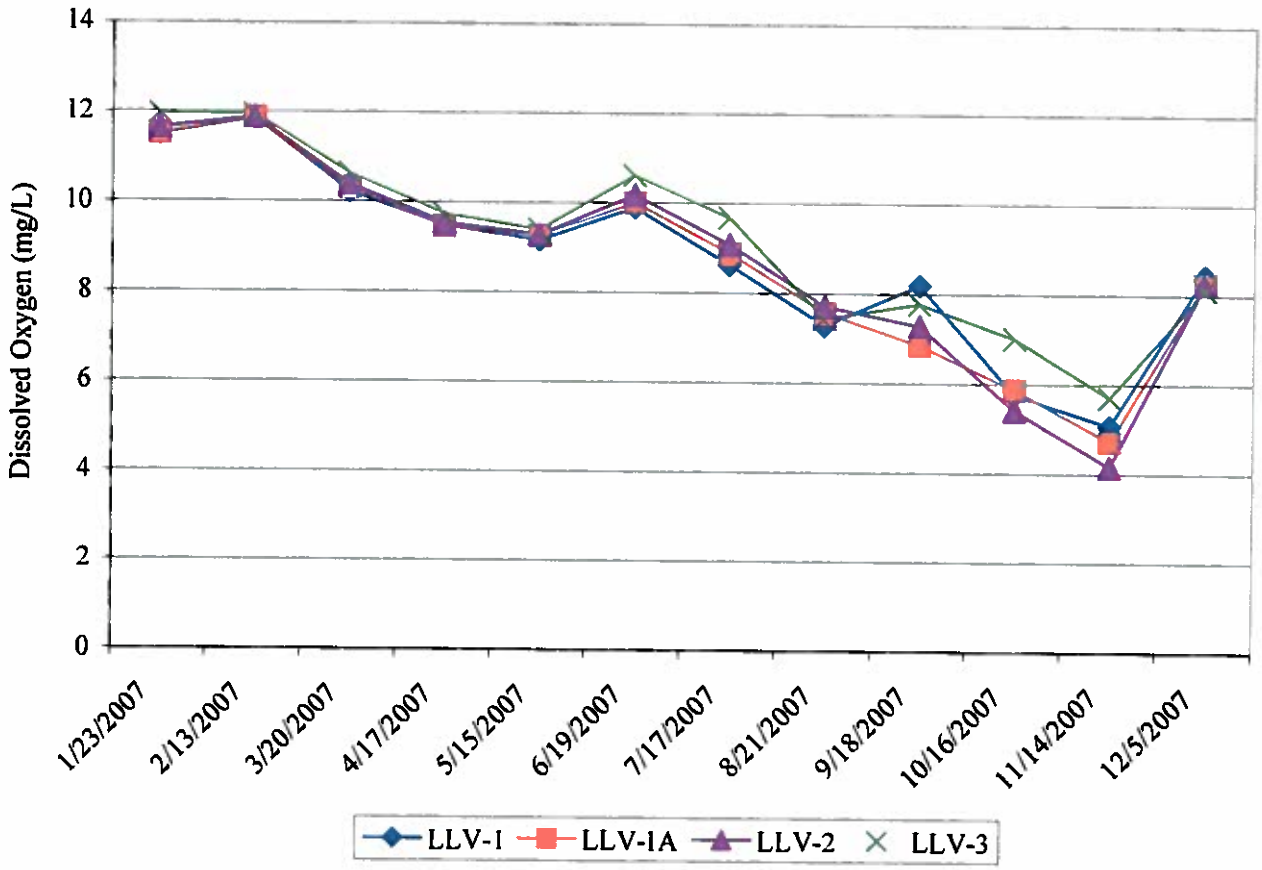


Figure 5. **Lake Las Vegas dissolved oxygen (mg/L) in surface waters at Lake monitoring stations during 2007.**

The Lake remained relatively well mixed during the late fall through late spring. During the period of stratification, dissolved oxygen concentrations below the thermocline were less than 5.0 mg/L (Table 5).

Table 5. **Lake Las Vegas dissolved oxygen (mg/L) profiles at station LLV-1A during March, June, September, and December 2007.**

Depth (m)	3/20/2007	6/19/2007	9/18/2007	12/5/2007
0	10.3	10	6.84	8.25
2	10.27	10.04	7.24	8.27
4	10.45	10.56	4.39	8.21
6	10.67	10.73	4.39	8.09
8	10.41	8.26	2.63	8.09
10	10.04	5.69	2.11	8.17
12	9.87	1.79	0.21	8.13
14	9.69	0.34	0.22	8.23
16	9.21	0.55	0.25	8.12
18	9.18	0.38	0.26	8.12
20	8.92	0.44	0.28	8.14
22	8.94	0.57	0.3	8.06
24	8.98	0.63	0.36	7.91

pH

There was little seasonal variation in pH of surface waters in Lake Las Vegas during 2007 (Figure 6). Surface water pH values varied slightly between the four Lake sites ranging between 7.9 and 8.4 in 2007 (Figure 6). Minor variability can be attributed to spatial distribution of phytoplankton activity. Depth profiles of pH indicated the pH followed a similar trend of dissolved oxygen. During periods of stratification pH values decreased as bicarbonate concentrations declined with the onset of anaerobic conditions (Table 6). Please note that there were no pH readings during the months of October and November due to the Hydrolab equipment having to be shipped to the factory for repair. Normal sampling resumed in December.

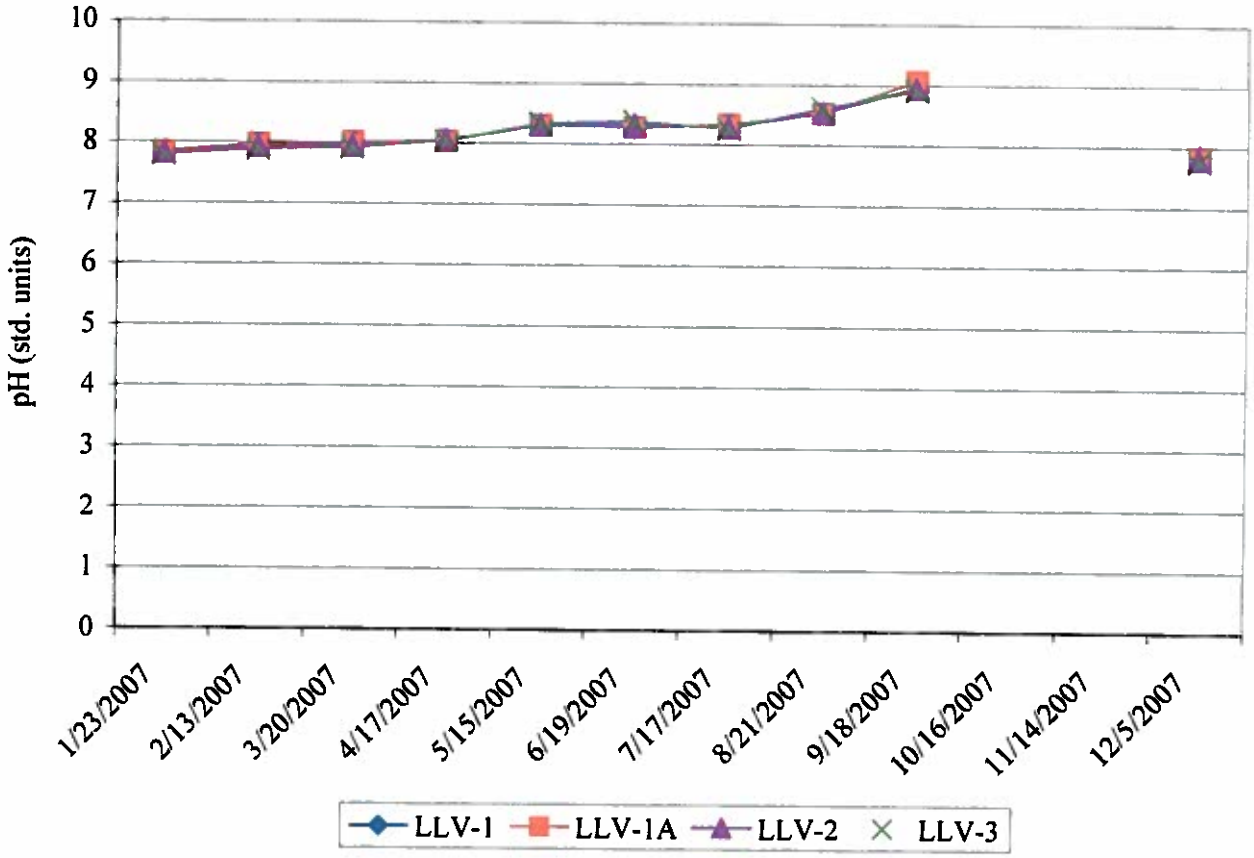


Figure 6. **Lake Las Vegas pH (standard units) in surface water at Lake monitoring stations during 2007.**

Table 6. **Lake Las Vegas pH (standard units) profiles at station LLV-1A during March, June, September and December 2007.**

Depth	3/20/2007	6/19/2007	9/18/2007	12/5/2007
0	8	8.28	*	7.83
2	7.97	8.26	*	7.81
4	7.93	8.19	*	7.81
6	7.92	8.1	*	7.8
8	7.85	7.86	*	7.8
10	7.8	7.55	*	7.8
12	7.77	7.21	*	7.8
14	7.76	7.12	*	7.8
16	7.74	7.13	*	7.8
18	7.73	7.12	*	7.79
20	7.72	7.13	*	7.79
22	7.74	7.17	*	7.78
24	7.75	7.18	*	7.77

* Hydrolab equipment shipped to the factory for repair. Normal sampling resumed in September.

Specific Conductance

Lake water specific conductivity ranged between roughly 2,199 µmhos/cm and 2,511 µmhos/cm at the surface during 2007 (Figure 7). Higher readings in August and November are contributed to storm water intake. Specific conductivity did not vary significantly between the four lake sites or with depth (Table 7).

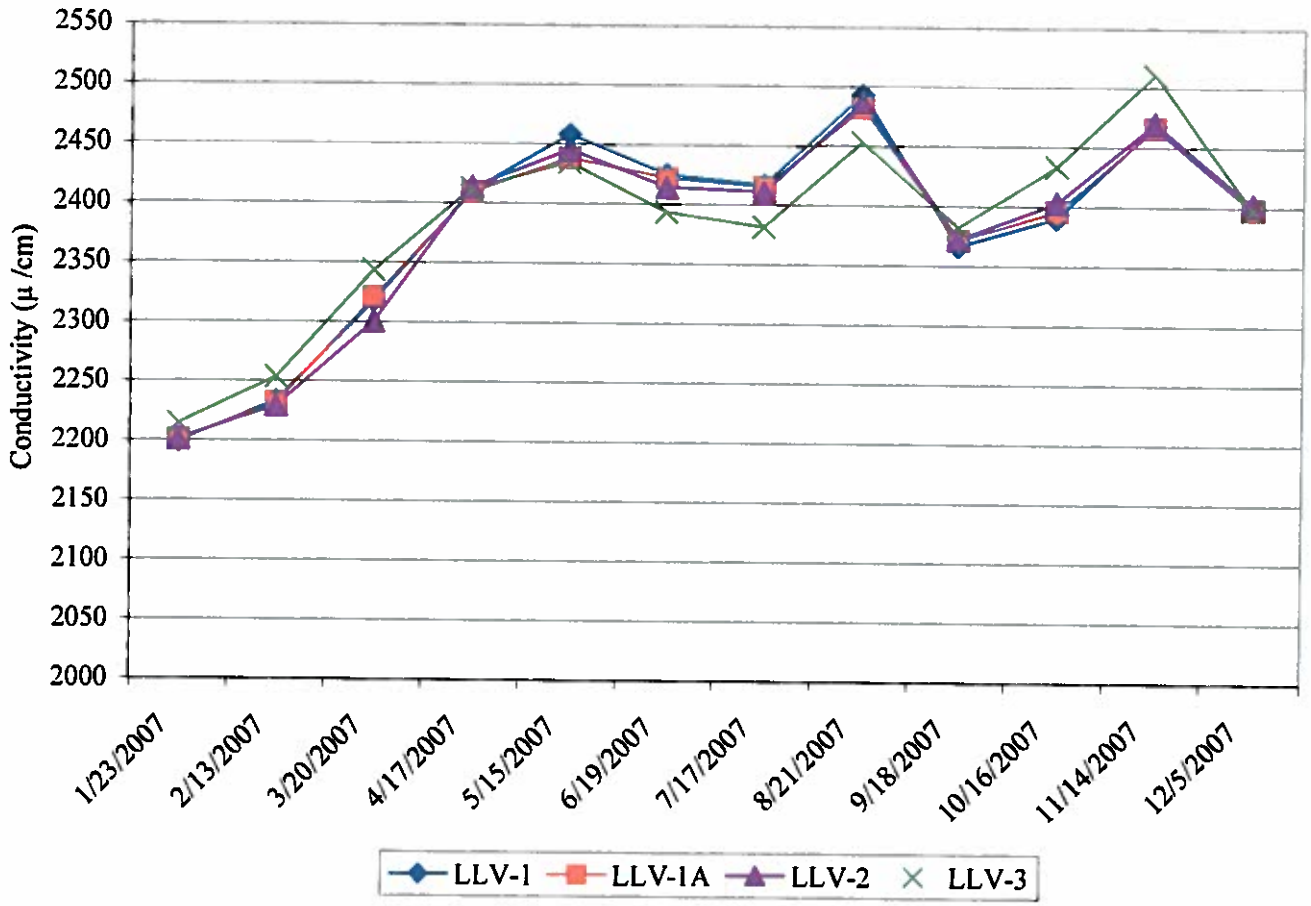


Figure 7. **Lake Las Vegas conductance (µmhos/cm) in surface waters at Lake monitoring stations during 2007.**

Table 7. **Lake Las Vegas conductance (µmhos/cm) profiles at station LLV-1A during March, June, September, and December 2007.**

Depth (m)	3/20/2007	6/19/2007	9/18/2007	12/5/2007
0	2320	2422	2371	2398
2	2321	2419	2366	2394
4	2314	2407	2365	2394
6	2291	2387	2365	2394
8	2303	2413	2369	2394
10	2291	2408	2408	2394
12	2290	2384	2518	2394
14	2287	2370	2497	2394
16	2287	2345	2488	2394
18	2283	2351	2483	2396
20	2282	2349	2548	2397
22	2282	2364	2542	2398
24	2285	2367	2545	2399

Transparency (Secchi)

There was considerable seasonal and spatial variability in Lake transparency values during 2007 with values ranging between 1.5 and 8.5 meters of lake depth. Transparency was high during the spring and fall and lower during the summer months. Sampling location LLV-3 continues to exhibit lower transparency values due to the shallow nature of the west end of the lake. This site is influenced by wind and boat activity (Figure 8).

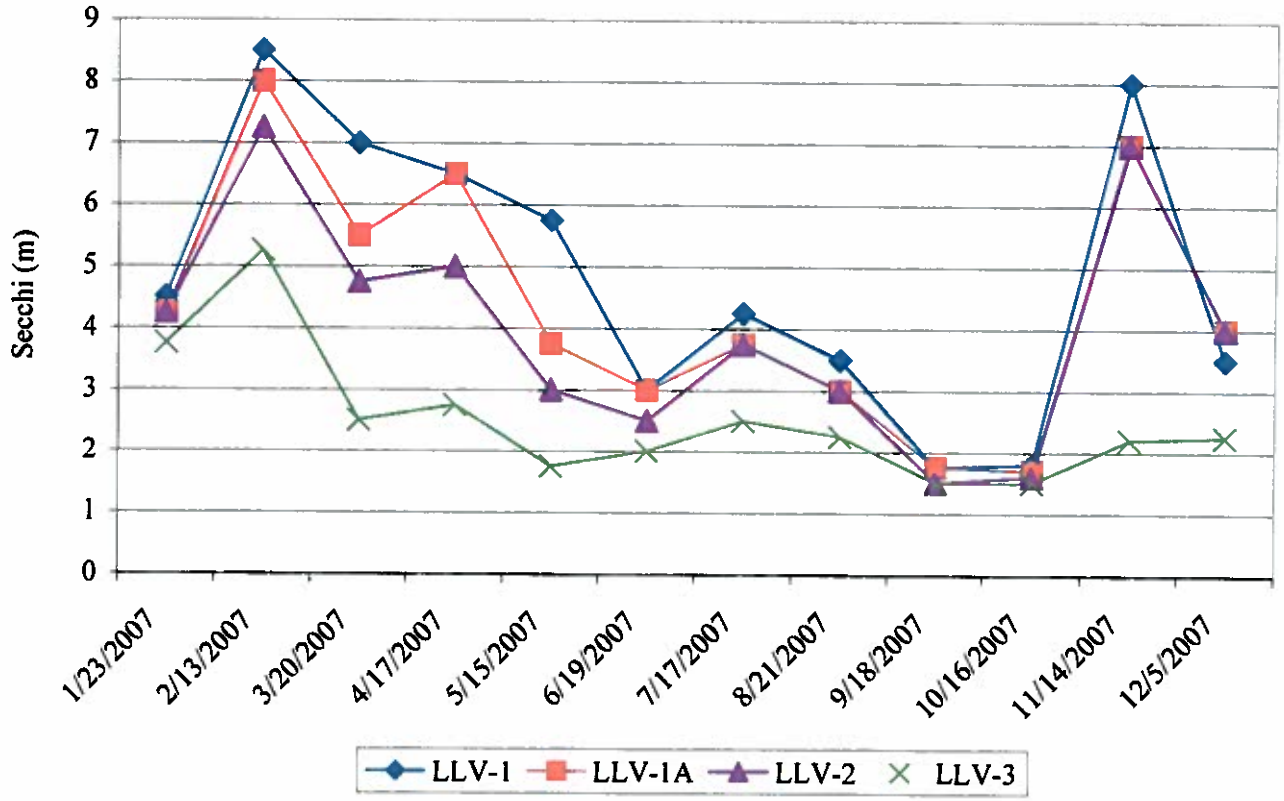


Figure 8. **Lake Las Vegas transparency (m) measurements in surface water at Lake monitoring stations during 2007.**

Turbidity

Monthly turbidity concentrations varied between 1.0 and 1.77 between depths at site LLV-1A in 2007 (Table 8).

Table 8. **2007 Lake Las Vegas chemical concentrations at site LLV-1A during the months of March, June, September and December at 0, 5, 10 and 20m depths.**

Date	Depth (m)	BOD5 (mg/L)	TDS (mg/L)	TSS (mg/L)	TURB (mg/L)	Chl-a (µg/L)	Ortho phos (µg/L)	Total phos (µg/L)	Nitrite + Nitrate (µg/L)	Ammonia (µg/L)	TKN (µg/L)	Total Nitrogen (mg/L)	Ca (mg/L)	Cl (mg/L)	HCO3 (mg/L)	SO4 (mg/L)	Na (mg/L)	K (mg/L)	Mg (mg/L)
3/20/07	0	2	1550	1.2	1	5.3	0	7	682	330	800	1482	184	238	100	743	230	23.6	56.9
3/20/07	5	2	1478	1	1	1	5	11	822	230	800	1622	179	237	95	744	238	24.5	55.5
3/20/07	10	2	1540	1	1	1	0	5	1540	260	660	2200	181	230	100	718	235	24.2	56.1
3/20/07	20	2	1570	6.4	1	1	8	16	795	240	850	1645	186	234	100	737	229	23.5	56.7
6/19/07	0	2	1690	5.4	1	3.2	5	17	632	90	1340	1972	195	242	75	740	246	23.1	56.4
6/19/07	5	2.5	1636	3.4	1	3.2	5	12	625	190	1030	1655	193	242	75	718	251	23	56.6
6/19/07	10	2	1690	3.4	1	4.3	5	17	811	190	550	1361	202	239	95	750	239	22.6	26.8
6/19/07	20	2	1670	7.2	1	1.6	8	36	737	210	490	1227	204	217	115	687	239	23.1	56.3
9/18/07	0	6.2	1610	6.8	1	44.9	5	23	498	120	910	1408	169	278	60	746	255	22.1	52.6
9/18/07	5	3.54	1580	4.2	1	11.2	5	17	509	70	770	1279	164	294	60	758	254	21.1	51.5
9/18/07	10	4.5	1670	2.8	1	3.2	5	43	360	250	1040	1400	174	307	90	775	263	21.8	52.4
9/18/07	20	7.06	1730	2.4	1.77	3.2	81	91	706	840	1350	2056	200	311	140	774	267	21.7	55.3
12/5/07	0	2	1650	2.4	1	2.7	15	23	662	400	1030	1692	179	274	90	747	266	25	59.7
12/5/07	5	2	1670	2.2	1	1.1	15	21	432	390	1060	1492	185	327	90	705	259	24.5	61.5
12/5/07	10	2	1710	1.2	1	2.7	15	26	652	380	1130	1782	182	280	90	714	268	21.3	60.6
12/5/07	20	2	1700	4.4	1	2.1	17	23	682	350	900	1582	175	324	90	702	273	20.8	58.3

C. Chemical Analysis

Total Suspended Solids

Monthly total suspended solids concentrations varied between 1.0 and 8.8 mg/L with no significant differences between the sites. The highest concentrations occurred post August storm (Figure 9). There were no significant differences in total suspended solids concentrations between depths at site LLV-1A in 2007 with values ranging between 1.0 and 7.2 mg/L (Table 8).

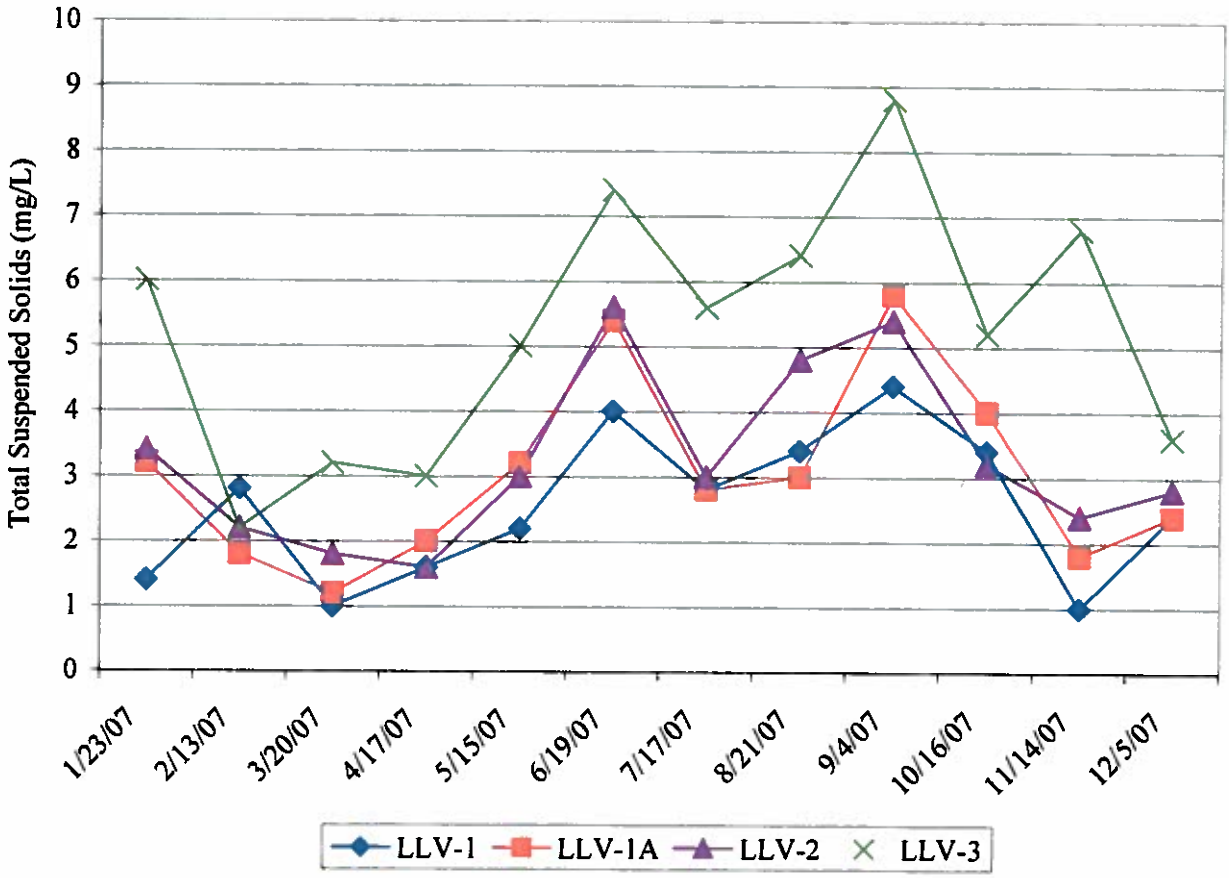


Figure 9. **Lake Las Vegas total suspended solids (mg/L) concentrations in surface waters at Lake monitoring stations during 2007.**

Total Dissolved Solids

There was no significant difference in monthly total dissolved solids (TDS) concentrations between the four Lake sites (Figure 10). Monthly concentrations ranged between 1,440 and 1,780 mg/L at the surface (0-2.5m). TDS concentrations ranged between 1,478 and 1,730 mg/L at depth with no significant difference in total dissolved solids concentrations between depths at site LLV-1A in 2007. TDS concentrations continue to remain below the 2,000 mg/L guideline for irrigation purposes (Table 8).

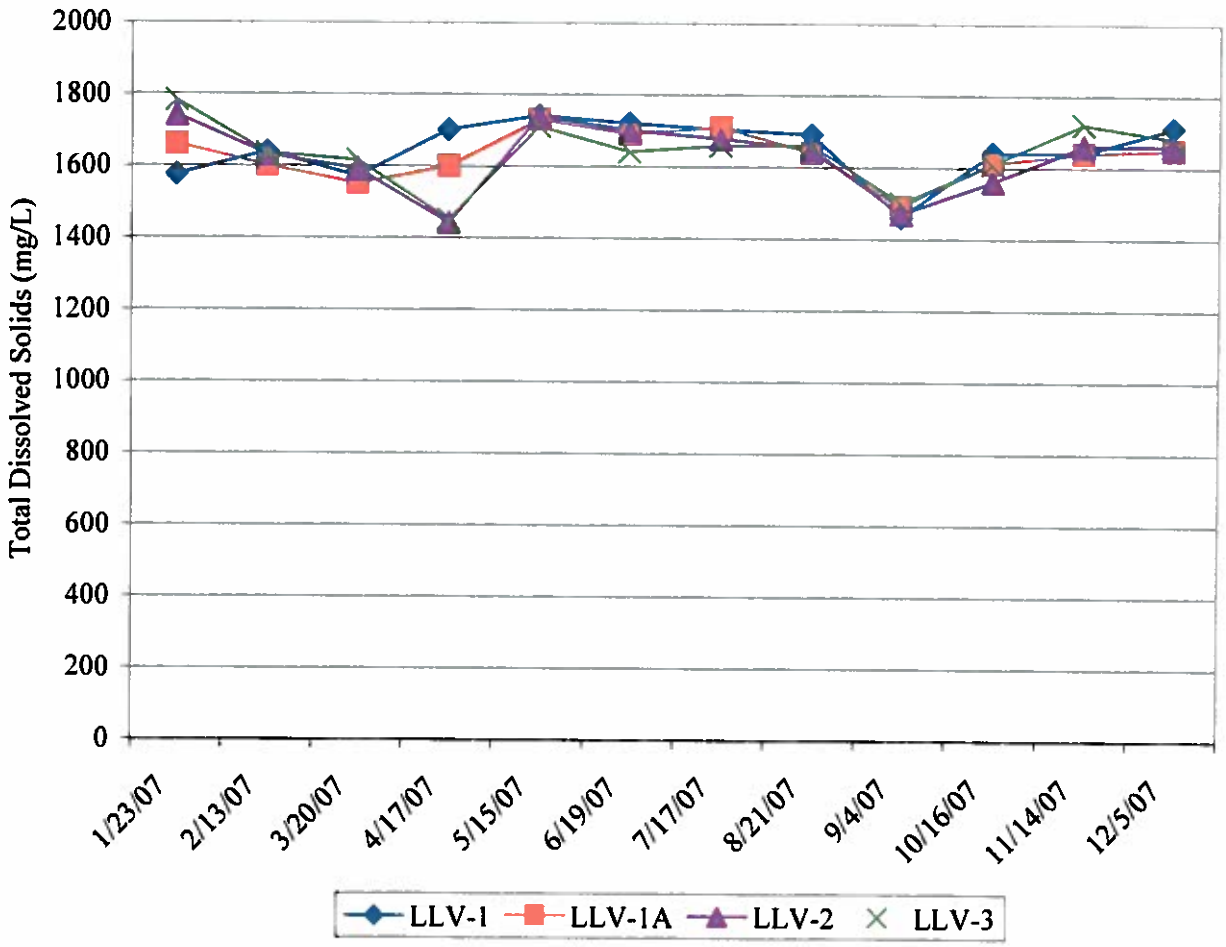


Figure 10. **Lake Las Vegas total dissolved solids (mg/L) concentrations at Lake monitoring stations during 2007.**

Major Ion Concentrations

Quarterly depth samples did not vary significantly at site LLV-1A for the ions of calcium, sodium, chloride, potassium, sulfate and magnesium (Table 8). However, ion concentrations have exhibited a gradual upward trend from 2006 to 2007.

Total Phosphorus

Monthly concentrations ranged between 5 and 59 µg/L at the surface (0-2.5m). (Figure 11) This is compared to 7 and 38 µg/L last year. Monthly total phosphorus concentrations varied slightly (5 and 91 µg/L) between depths at site LLV-1A (Table 8). It appears that a sampling error occurred on January 23 resulting in this drastic total phosphorus reading.

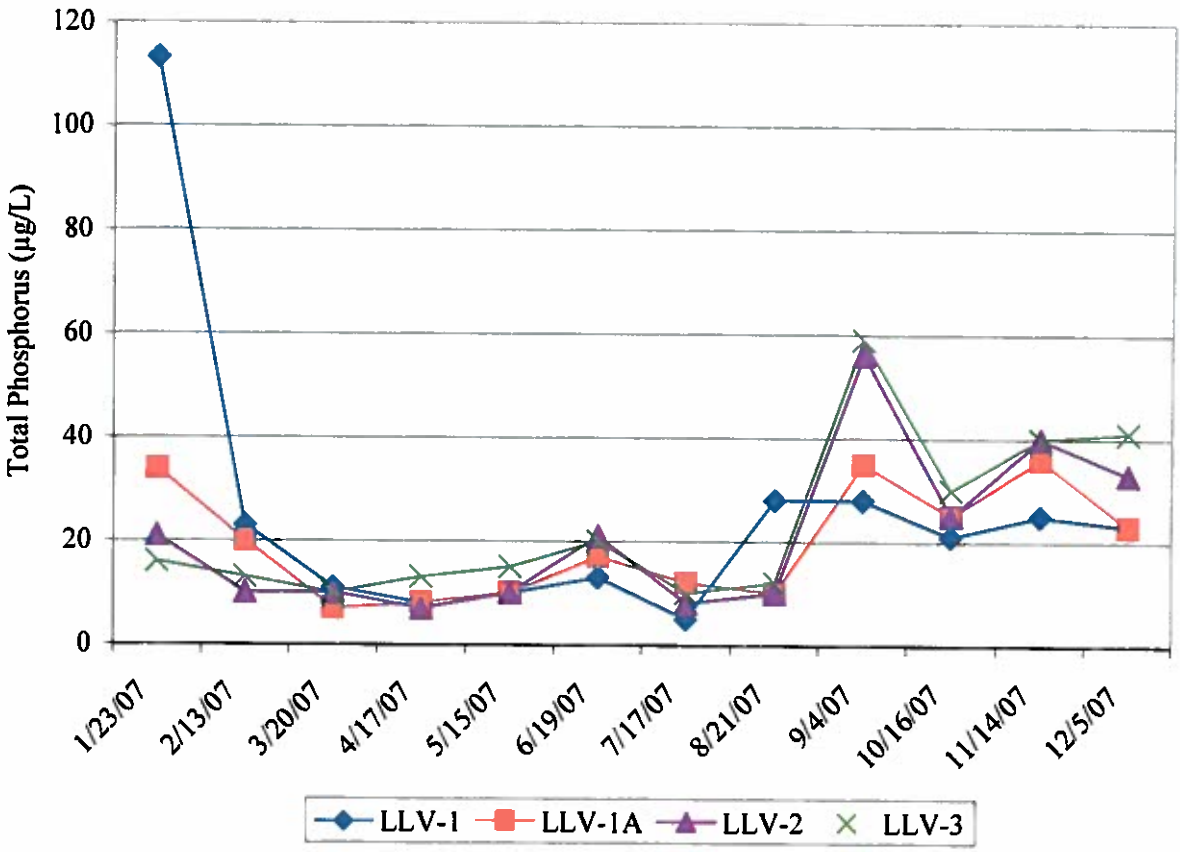


Figure 11. **Lake Las Vegas total phosphorus (µg/L) concentrations in surface waters at Lake monitoring stations during 2007.**

Ortho-Phosphorus

Monthly Ortho-phosphorus concentrations did not vary significantly between sites and ranged between 5 and 17 µg/L as compared with 5 and 16 µg/L in 2006 (Figure 12). Monthly ortho-phosphorus concentrations did not show a significant difference between depths with concentrations ranging between 0 and 81 µg/L (Table 8).

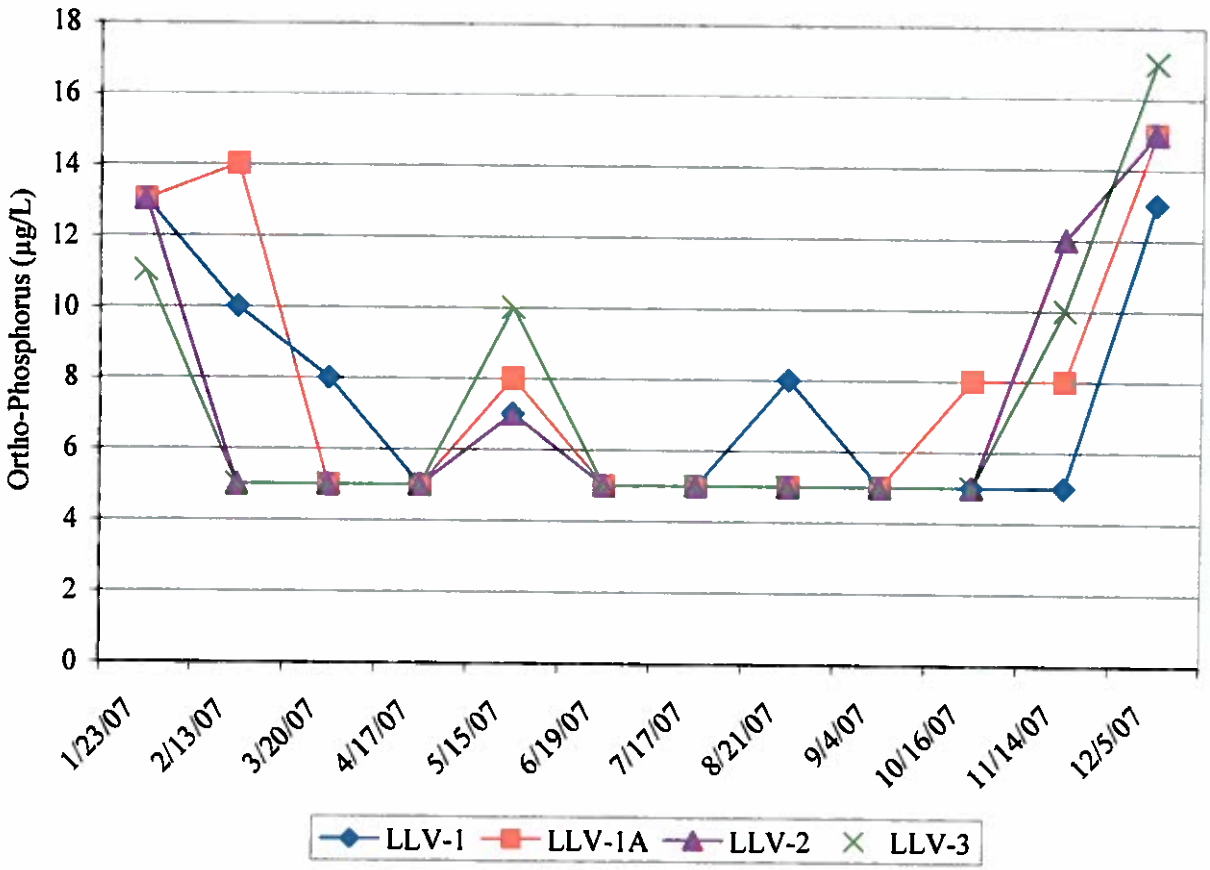


Figure 12. **Lake Las Vegas ortho-phosphorus µg/L concentrations in surface waters at Lake monitoring stations during 2007.**

(Nitrite + Nitrate) – Nitrogen

Monthly nitrite plus nitrate surface water concentrations ranged between 337 and 898 µg/L at the four Lake sites in 2007 as compared with 280 and 2,099 µg/L in 2006 (Figure 13). Concentrations varied by depth between 432 and 1,540 µg/L (Table 8).

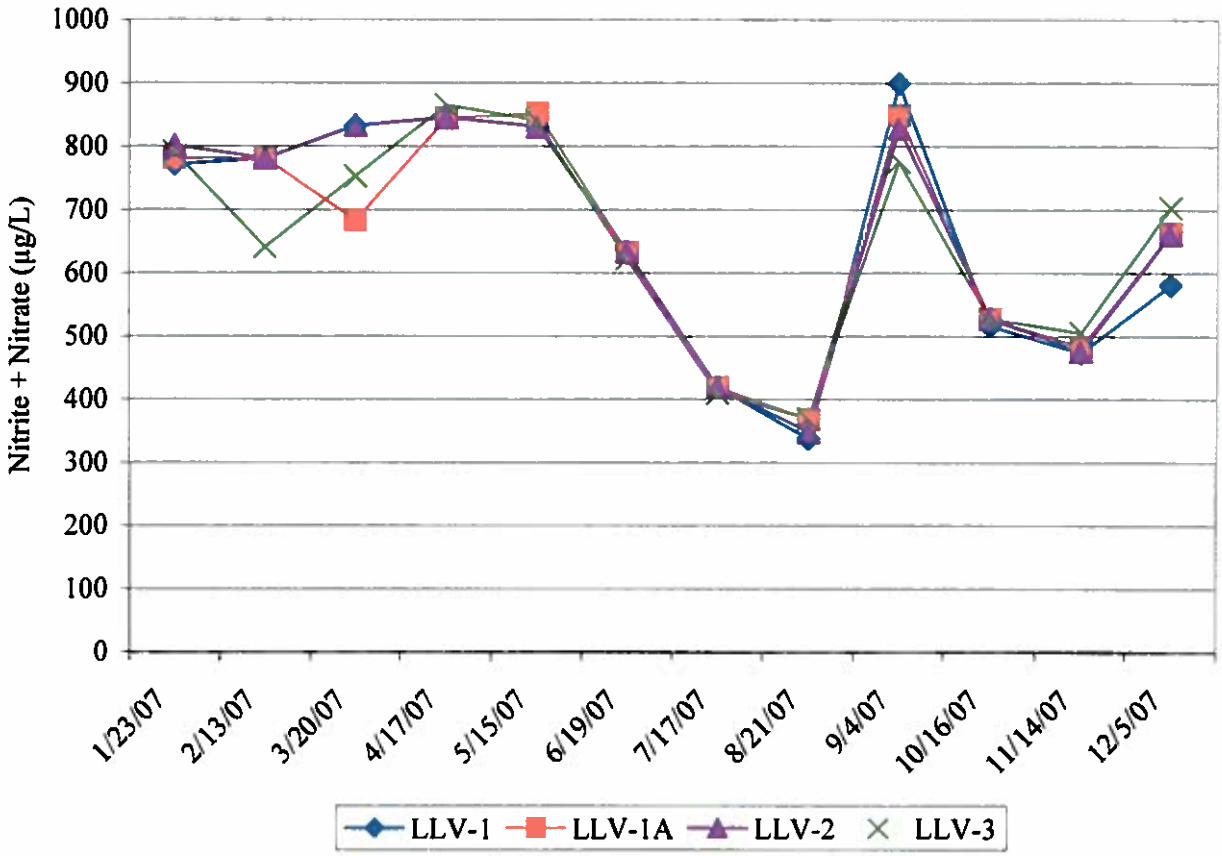


Figure 13. **Lake Las Vegas nitrite + nitrate (µg/L) concentrations in surface waters at Lake monitoring stations during 2007.**

Ammonia - Nitrogen

Monthly ammonia surface water concentrations ranged between 50 to 400 µg/L during 2007, with no significant difference between the four Lake sites as compared to 50 to 480 µg/L in 2006 (Figure 14). Variability in concentrations between depths was not found significant for ammonia during 2006 at site LLV-1A with values ranging between 90 and 840 µg/L (Table 8).

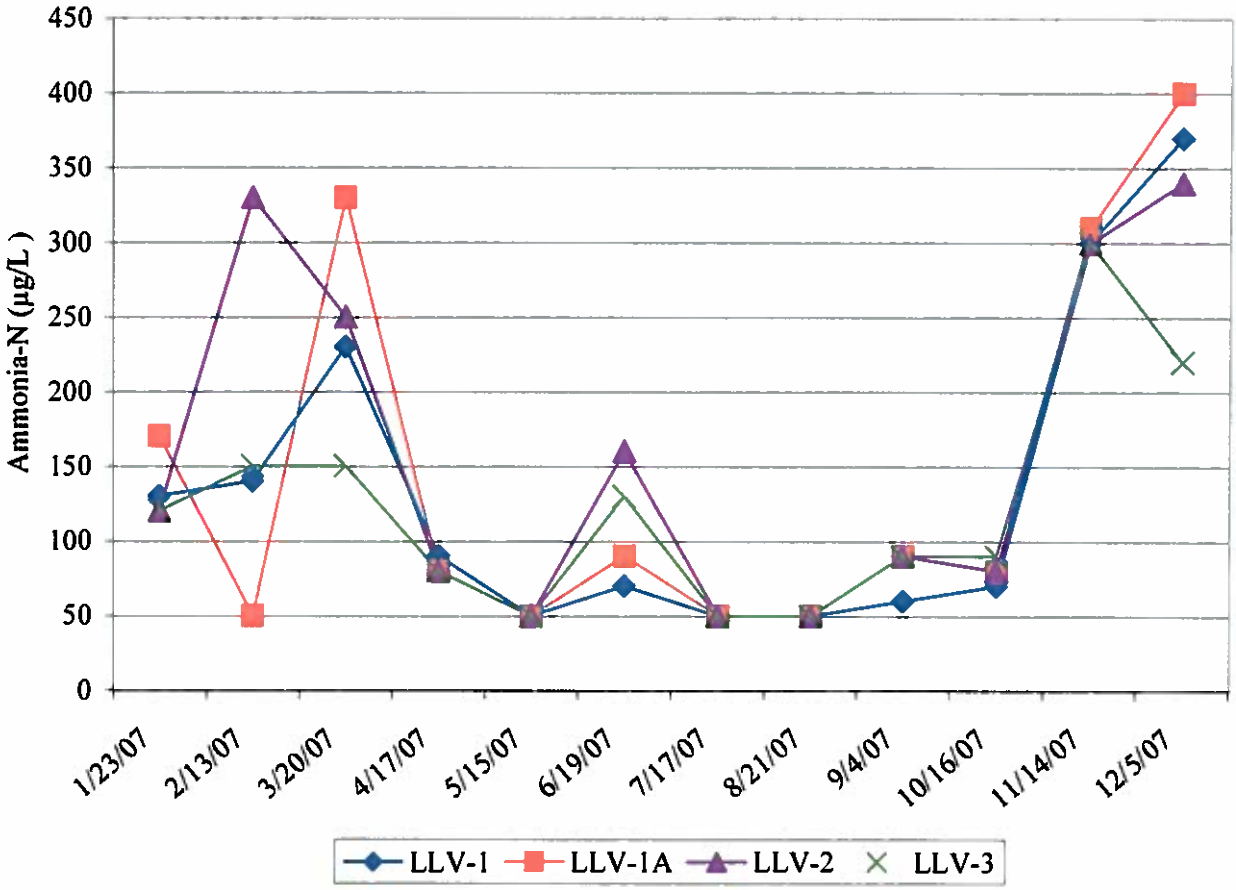


Figure 14. **Lake Las Vegas ammonia-N concentrations (µg/L) in surface waters at Lake monitoring stations during 2007.**

Total Nitrogen

Monthly total nitrogen concentrations ranged between 758 and 3,874 µg/L and were not significantly different between sites but slightly elevated when compared to 511 and 3,129 µg/L in 2006 (Figure 15). No significant difference was found between depths at site LLV-1A during 2007 concentrations varying between 1227 and 2,200 µg/L with depth (Table 8).

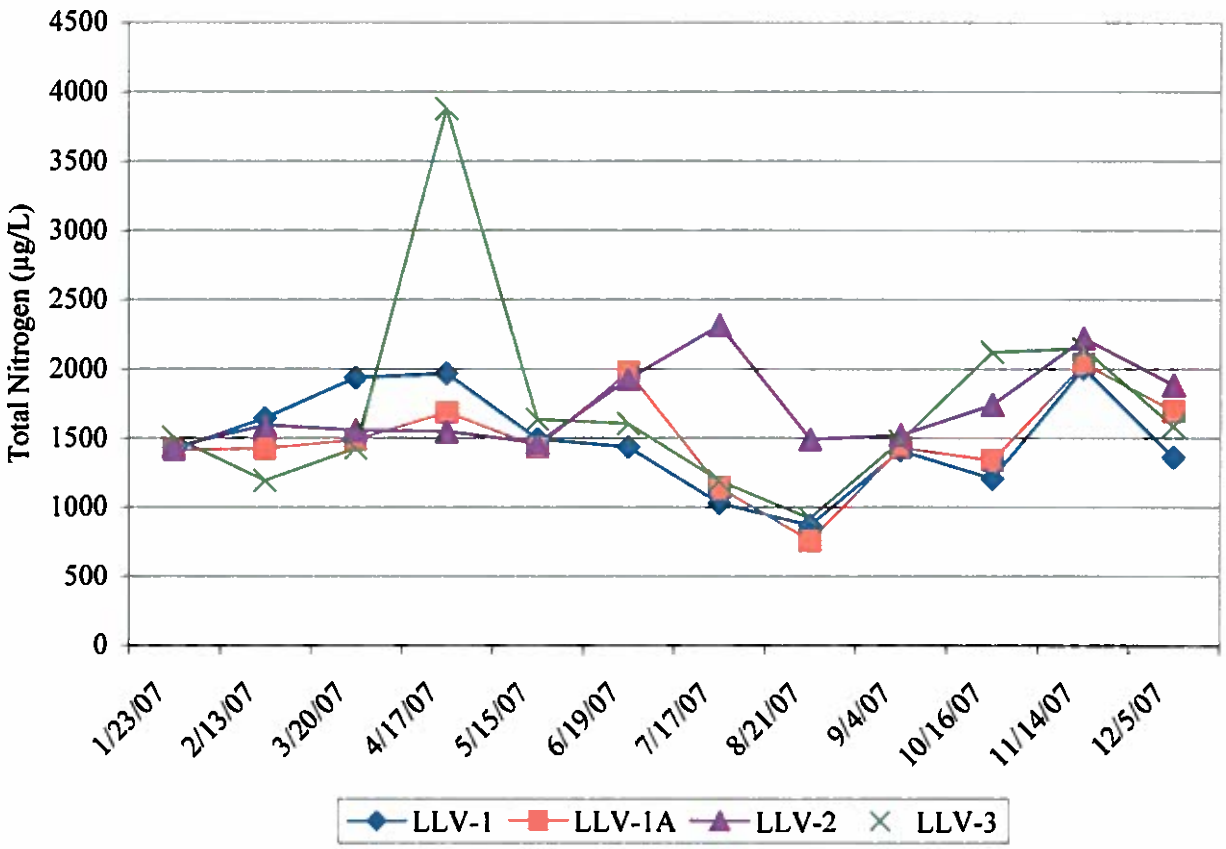


Figure 15. **Lake Las Vegas Total Nitrogen (µg/L) concentrations in surface waters at Lake monitoring stations during 2007.**

D. Biological Analysis

Zooplankton Species Composition and Abundance

Numerous species of zooplankton have been identified in the 0 – 15 m vertical plankton tows at station LLV-1 in 2007 (Table 9). Copepods dominated the population with a frequency of 51.0%, followed by Rotifers (28.6%) and Cladocerans (20.4%) during 2007.

Nauplii exhibited the greatest average annual average density in 2007 of 650,248 #/m^3 (Table 9). Of the Cladoceran family, *Daphnia pulex* dominated with average densities totaling 195,941 #/m^3. This genus is well known for their ability to control phytoplankton populations in pelagic zones.

Table 9. **Lake Las Vegas zooplankton species identified in the 0 – 15 meter vertical plankton tows at station LLV-1 during 2007.**

Divison	Genus/Species	#/m3	FREQ %	RFREQ %
1. Cladocerans	*Alona sp.*	16,350	3	0.7
	Bosmina longirostris	53,585	11	2.3
	Daphnia galeata mendotae	14,017	3	0.6
	Daphnia juveniles	6,610	1	0.3
	Daphnia pulex	195,941	41	8.4
	Moina sp.	189,032	40	8.1
	Total Cladocerans	475,535	100	20.4
2. Copepods	*Ceratuim hirundinella*	15,984	1	0.7
	Copepodid	122,910	10	5.3
	Cyclops vernalis	478	0	0.0
	Diacyclops bicuspidatus	4,770	0	0.2
	Diaptomus sp.	361,971	30	15.5
	Mesocyclops edax	33,524	3	1.4
	Nauplii	650,248	55	27.9
	Total Copepods	1,189,885	100	51
Rotifers	*Asplanchna sp.*	10,257	2	0.4
	Brachionus caudatus	94,585	14	4.1
	Filinia longiseta	19,404	3	0.8
	Hexarthra sp.	86,884	13	3.7
	Keratella cochlearis	21,421	3	0.9
	Keratella sp.	429,239	64	18.4
	Notholca sp.	1,557	0	0.1
	Polyarthra sp.	4,469	1	0.2
	Synchaeta sp.	870	0	0.0
	Total Rotifers	668,686	100.0	28.6

Chlorophyll-a

Chlorophyll-a concentrations ranged from 1 to 35.8 µg/L in surface water during 2007 compared to 1 to 18 µg/L in 2006. Concentrations were not significantly different between sites (Table 8). September concentrations peaked with the presence of Cyanobacteria and Pyrrhophyta blooms (Figure 17).

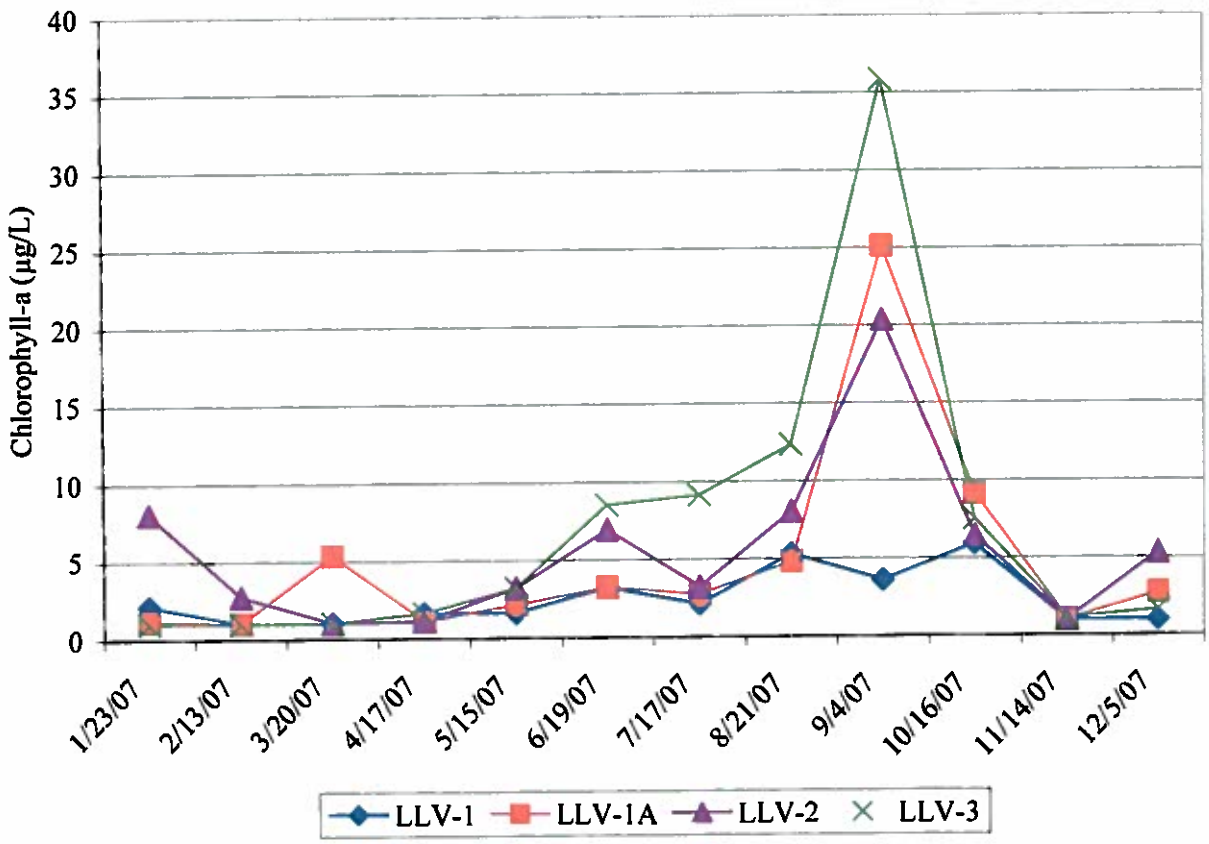


Figure 16. **Lake Las Vegas chlorophyll-a (µg/L) concentrations in surface waters at Lake monitoring stations during 2007.**

Phytoplankton

Eight (8) taxonomic divisions of phytoplankton were found at LLV-1 during 2007 (Table 10). By abundance the most frequently observed division in 2007 was Pyrrhophyta (44.83%). The remaining seven (7) divisions relative frequencies were as follows: Cyanobacteria (40.99%), Bacillariophyceae (9.92%), Chlorophyta (1.68%), Cryptophyta (1.24%), Haptophyta (1.11%), Chrysophyta (0.13%), Microflagellates (0.10%) were distributed in relation to Chlorophyta during the year (Table 10).

Table 10. **Lake Las Vegas phytoplankton species (mg/m^3) identified in the 0 – 2.5 meter composite sample at station LLV-1 during 2007.**

Division	Genus/Species	BIOMASS mg/m^3	FREQ %	RFREQ %
1. BACILLARIOPHYCEAE	*Achnanthidium sp.*	1.3	0.04	0.00
	Anomoeoneis vitrea	2.9	0.09	0.01
	Cyclostephanos dubius	2597.0	77.29	7.67
	Cyclotella 6-10 um	21.1	0.63	0.06
	Cyclotella < 6um	41.7	1.24	0.12
	Cyclotella 15-20um	37.5	1.12	0.11
	Cyclotella glomerata	179.7	5.35	0.53
	Cyclotella meneghiniana	348.4	10.37	1.03
	Cyclotella sp.	104.6	3.11	0.31
	Nitzschia sp. (11-25um)	7.3	0.22	0.02
	Nitzschia spp	17.2	0.51	0.05
	Synedra ulna	1.3	0.04	0.00
	Total Bacillariophyceae	3360.0	100.00	9.92
2. CHLOROPHYTA	*Ankyra judayi*	0.9	0.16	0.00
	Botryococcus braunii	21.6	3.79	0.06
	Chlamydomonas globosa	8.4	1.47	0.02
	Chlorogonium sp.	0.8	0.14	0.00
	Crucigenia quadrata	2	0.35	0.01
	Gloeocystis sp.	13.1	2.30	0.04
	Mougeotia sp.	16.5	2.89	0.05
	Oocystis gigas v. incrassata	8.5	1.49	0.03
	Oocystis sp.	101.6	17.82	0.30
	Pyramichlamys dissecta	252.2	44.24	0.74
	Quadrigula chodatii	1.30	0.23	0.00
	Quadrigula closterioides	3.8	0.67	0.01
	Scendedsmus bijuga	8.5	1.49	0.03
	Scenedesmus communis	2.2	0.39	0.01
	Sphaerocystis schroeteri	128.7	22.57	0.38
	Total Chlorophyta	570.1	100.00	1.68
3. CHRYSOPHYTA	*Ochromonas sp.*	45.7	100	0.13
	Total Chrysophyta	45.7	100	0.13

Table 10 continued. **Lake Las Vegas phytoplankton species (mg/m^3) identified in the 0 – 2.5 meter composite sample at station LLV-1 during 2007.**

Division	Genus/Species	BIOMASS mg/m^3	FREQ %	RFREQ %
4. CRYPTOPHYTA	*Cryptomonas erosa*	52.5	12.46	0.15
	Cryptomonas marssonii	26.20	6.22	0.08
	Cryptomonas sp. (10 -15 um)	21.7	5.15	0.06
	Crytpomonas spp.	41.3	9.80	0.12
	Katavlepharis ovalis	7.1	1.68	0.02
	Rhodomonas minuta	272.6	64.69	0.80
	Total Cryptophyta	421.4	100.00	1.24
5. CYANOBACTERIA	*Anabaena aphanizomenoides*	9209.9	66.33	27.18
	Anabaen inaequalis	0.5	0.00	0.00
	Anabaen sp.	6.7	0.05	0.02
	Aphanocapsa holsatica	1	0.01	0.00
	Aphanocapsa delicatissima	13.9	0.10	0.04
	Aphanocapsa incerta	12.8	0.09	0.04
	Aphanocapsa pulchra	15.6	0.11	0.05
	Aphanothece nidulans	0.2	0.00	0.00
	Chroococcus minimus	51.2	0.37	0.15
	Coelomoron pusillum	61.0	0.44	0.18
	Cylindrospermopsis raciborskii	2.7	0.02	0.01
	Cylindrospermopsis raciborskii - sp	1.3	0.01	0.00
	Lyngbya birgei	766.7	5.52	2.26
	Merismopedia tenuissima	62.1	0.45	0.18
	Microcystis ichthyoblabe	554.3	3.99	1.64
	Microcystis incerta	0.2	0.00	0.00
	Microcystis smithii	3.6	0.03	0.01
	Planktolyngbya limnetica	0.4	0.00	0.00
	Planktothrix agardhii	3033.9	21.85	8.96
	Planktothrix perornata	0.7	0.01	0.00
	Pseudanabaena catenata	5.1	0.04	0.02
	Pseudanabaena limnetica	2.1	0.02	0.01
	Pseudanabaena sp.	0.4	0.00	0.00
	Single coccoid (<2 um)	59.8	0.43	0.18
	Spirulina subsalsa	3.5	0.03	0.01
	Synechococcus nidulans	1.1	0.01	0.00
	Synechocystis aquatilis	14.9	0.11	0.04
	Total Cyanobacteria	13885.6	100.00	40.99

Table 10 continued. **Lake Las Vegas phytoplankton species (mg/m^3) identified in the 0 – 2.5 meter composite sample at station LLV-1 during 2007.**

Division	Genus/Species	BIOMASS mg/m^3	FREQ %	RFREQ %
6. HAPTOPHYTA	*Chrysochromulina parva*	374.4	100	1.11
	Total Haptophyta	374.4	100	1.11
7. MICROFLAGELLATES	*Microflagellates < 3 um*	0.1	0.28	0.00
	Microflagellates 3-5 um	35.4	99.72	0.10
	Total Microflagellates	35.5	100.00	0.10
8. PYRRHOPHYTA	*Ceratium hirundinella*	1233.4	8.12	3.64
	Glenodinium gymnodinium	0.7	0.00	0.00
	Glenodinium pulvisculus	2.2	0.01	0.01
	Glenodinium sp.	4.7	0.03	0.01
	Gymnodinium sp.	5.2	0.03	0.02
	Peridinium penardiforme	13822.0	91.02	40.80
	Peridinium sp.	118.1	0.78	0.35
	Total Pyrrhophyta	15186.3	100.00	44.83
	TOTAL	**33879.0**		

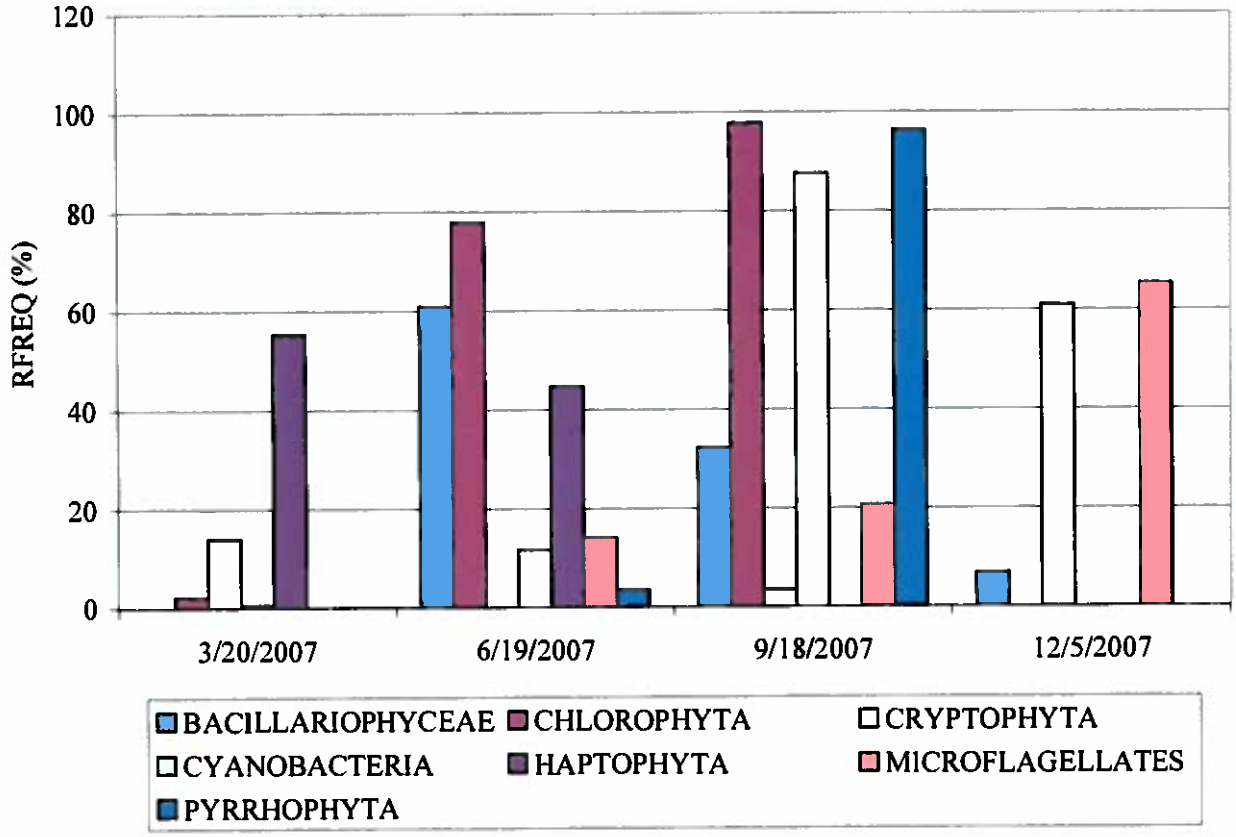


Figure 17. 2007 Quarterly Phytoplankton Relative Frequency.

In 2007 Bio-chemical oxygen demands (BOD_5) concentrations ranged between 2 and 3.86 mg/L. Concentrations fluctuated the greatest during the year, coinciding with algal cycles observed. These increases often occur with lake turn over in the fall and storm events.

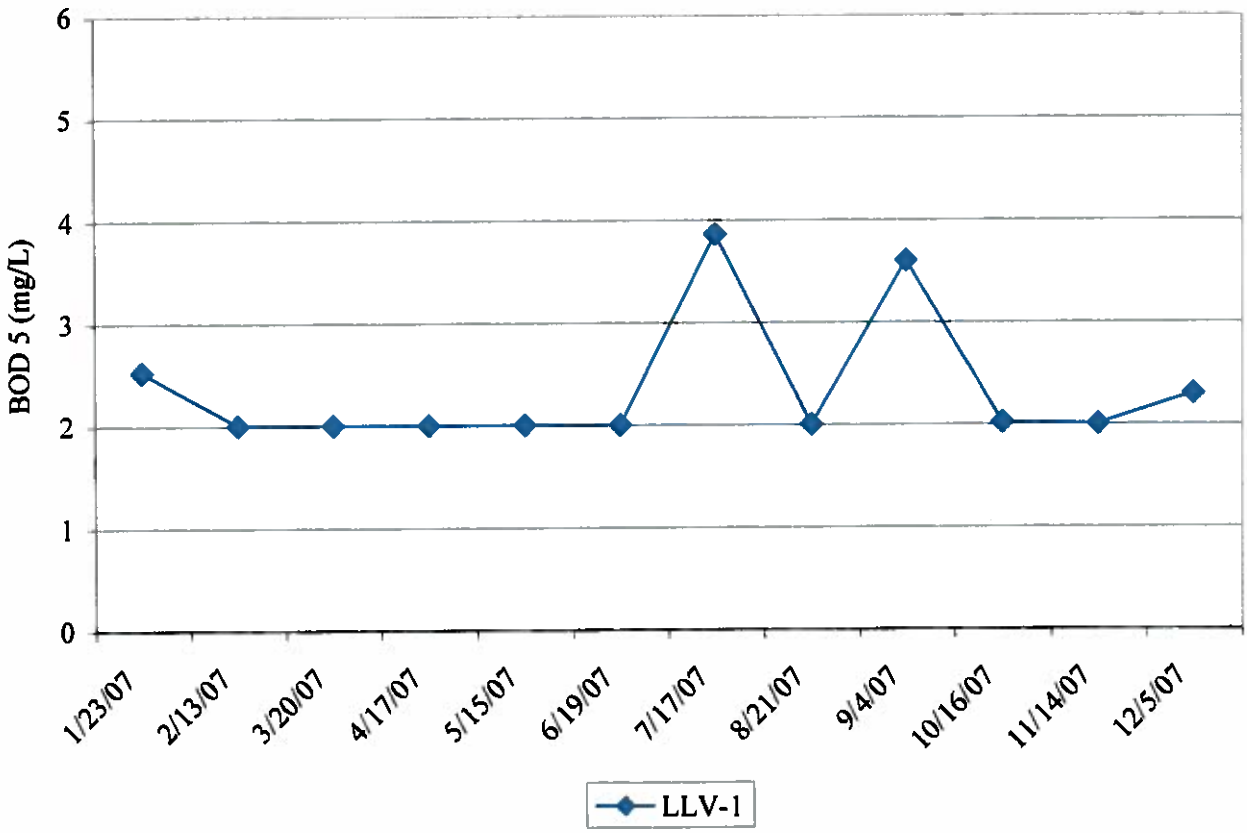


Figure 18. **Lake Las Vegas Biochemical Oxygen Demand (mg/L) concentrations in surface waters at Lake Monitoring Station (LLV-1) during 2007.**

Bacteria

Fecal coliform monitoring was completed on a monthly basis at Lake site LLV-1 in 2007. In 2007, bacteria sampling frequency was completed weekly during the months of April through October due to increased recreational use. Fecal coliform counts in surface waters were below body contact limits in 2007 (Figure 18).

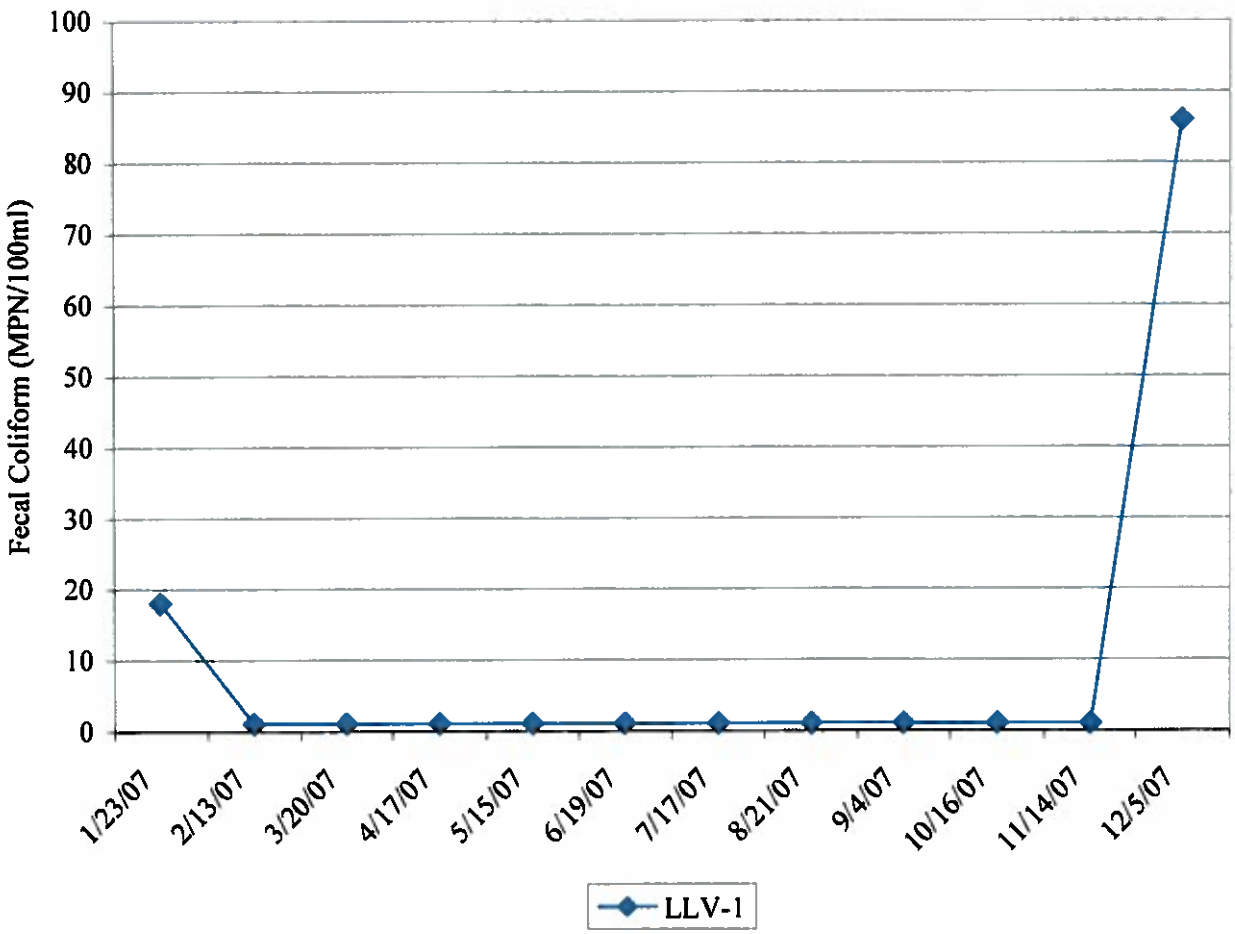


Figure 18. **Lake Las Vegas fecal coliform counts (MPN/100ml) in surface waters at Lake monitoring station (LLV-1) during 2007.**

Toxic Substances

Water samples for toxic analysis were collected from the surface (0m) and bottom (1m from bottom) of station LLV-1 during December 2007, when the lake was completely mixed. These samples were analyzed for toxic metals, trihalomethanes, pesticides, herbicides, PCBs, and various other organic and inorganic chemicals. Trace metal concentrations were well below the recommended MCLs. Concentrations of pesticides, herbicides and other toxic organic compounds also were below levels of detection. (Appendix C).

IV. SUMMARY

The water quality in Lake Las Vegas was within the proposed water quality guidelines for recreational uses. Average chlorophyll-a concentrations were at or below the proposed guideline of five (5) µg/L during April and May, but exceeded the guidelines during the months of June through October. The chlorophyll-a guideline is applied at that time of year to protect water quality during the peak recreation period. Fecal coliform bacteria were below the action level of 200 MPN/100ml. Concentrations of toxic metals, pesticides, herbicides and other toxic organic compounds were below detection limits. Water quality in Lake Las Vegas continues to be very good. The total dissolved solids and associated ions were exhibiting the highest concentrations in late fall due to summer evaporations. At the current concentrations, irrigation water is being removed from the lake without the need to blend with Lake Mead Water.

V. REFERENCES

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VI. APPENDIX

Annual Toxicity Analysis

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: December 20, 2007

REPORT NUMBER: 07-3693

CLIENT: Lake Las Vegas Master Association
1605 Lake Las Vegas Parkway
Henderson, Nevada 89011

CLIENT PROJECT:

CLIENT PO #:

Sampled By: Client
Date Sampled: 12/05/07
Time Sampled: Refer to COC

Submitted by: Client
Date Received: 12/05/06
Time Received: 1700

Report Attention: Jennifer Bay

Sample ID	Parameter	Result	Unit	Detection Limit	Method	Date Analyzed	Analyst
LLV 1A 0m	Nitrite	18	mg/L	0.01	EPA 300.0	12/06/07	RA
	Turbidity	ND	NTU	1.0	EPA 180.1	12/06/07	TS
LLV 1A 20m	Nitrite	18	mg/L	0.01	EPA 300.0	12/06/07	RA
	Turbidity	ND	NTU	1.0	EPA 180.1	12/06/07	TS

ND: non-detect
EPA Flag: none
NOTE: 608, 8270, and 8151 subcontracted to Anatek Labs, Moscow, ID (See attached laboratory report).

REVIEWED BY:

Ronald W. Winter
Laboratory Director

3638 East Sunset Road, Suite 100 • Las Vegas, NV 89120 • Tel: 702-873-4478 Fax: 702-873-7967
4600 Kietzke Lane, Suite D-130 • Reno, NV 89502 • Tel: 775-825-1127 Fax: 775-825-1167
www.ssalabs.com

Silver State Analytical Laboratories
Report Number: 07-3693
December 20, 2007

Sample ID: LLV 1A 0m
Method: 8260B GCMS

Analyzed by: AF
Date Analyzed: 12/13/07

Compound	Result µg/L	Reporting Limit µg/L	Compound	Result µg/L	Reporting Limit µg/L
Bromomethane	ND	5	Carbon disulfide	ND	15
Bromobenzene	ND	5	Carbon tetrachloride	ND	5
Bromochloromethane	ND	5	Chlorobenzene	ND	5
Bromodichloromethane	ND	5	Chloroethane	ND	5
Bromoform	ND	5	Chloroform	ND	5
2-Butanone (MEK)	ND	25	Chloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5	cis-1,2-Dichloroethene	ND	5
2-Chlorotoluene	ND	5	cis-1,3-Dichloropropene	ND	5
2-Hexanone	ND	20	Dibromochloromethane	ND	5
4-Chlorotoluene	ND	5	Dibromomethane	ND	5
4-Methyl-2-Pentanone	ND	20	Dichlorodifluoromethane	ND	5
Acrylonitrile	ND	20	Dimethyl Disulfide	ND	5
Benzene	ND	4	Ethylbenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5	Hexachlorobutadiene	ND	5
1,1,1-Trichloroethane	ND	5	Isopropylbenzene (Cumene)	ND	5
1,1,2,2- Tetrachloroethane	ND	5	m and p-Xylene	ND	5
1,1,2-Trichloroethane	ND	5	Methylene chloride	ND	5
1,1-Dichloroethane	ND	5	Methyl-tert-butylether	ND	5
1,1-Dichloroethene	ND	5	Naphthalene	ND	5
1,1-Dichloropropene	ND	5	n-Butylbenzene	ND	5
1,2,3-Trichlorobenzene	ND	5	n-Propylbenzene	ND	5
1,2,3-Trichloropropane	ND	5	o-Xylene	ND	5
1,2,4-Trichlorobenzene	ND	5	p-Isopropyltoluene	ND	5
1,2,4-Trimethylbenzene	ND	5	sec-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5	Styrene	ND	5
1,2-Dibromoethane	ND	5	tert-Butylbenzene	ND	5
1,2-Dichlorobenzene	ND	5	Tetrachloroethene	ND	4
1,2-Dichloroethane	ND	5	Toluene	ND	5
1,2-Dichloropropane	ND	5	trans-1,2-Dichloroethene	ND	5
1,3,5-Trimethylbenzene	ND	5	trans-1,3-Dichloropropene	ND	5
1,3-Dichlorobenzene	ND	5	Trichloroethene	ND	5
1,3-Dichloropropane	ND	5	Trichlorofluoromethane	ND	5
1,4-Dichlorobenzene	ND	5	Vinyl chloride	ND	5
2,2-Dichloropropane	ND	5			

ND: non-detect
EPA Flag: none

Silver State Analytical Laboratories
Report Number: 07-3693
December 20, 2007

Sample ID: LLV 1A 20m
Method: 8260B GCMS

Analyzed by: AF
Date Analyzed: 12/13/07

Compound	Result µg/L	Reporting Limit µg/L	Compound	Result µg/L	Reporting Limit µg/L
Bromomethane	ND	5	Carbon disulfide	ND	15
Bromobenzene	ND	5	Carbon tetrachloride	ND	5
Bromochloromethane	ND	5	Chlorobenzene	ND	5
Bromodichloromethane	ND	5	Chloroethane	ND	5
Bromoform	ND	5	Chloroform	ND	5
2-Butanone (MEK)	ND	25	Chloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5	cis-1,2-Dichloroethene	ND	5
2-Chlorotoluene	ND	5	cis-1,3-Dichloropropene	ND	5
2-Hexanone	ND	20	Dibromochloromethane	ND	5
4-Chlorotoluene	ND	5	Dibromomethane	ND	5
4-Methyl-2-Pentanone	ND	20	Dichlorodifluoromethane	ND	5
Acrylonitrile	ND	20	Dimethyl Disulfide	ND	5
Benzene	ND	4	Ethylbenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5	Hexachlorobutadiene	ND	5
1,1,1-Trichloroethane	ND	5	Isopropylbenzene (Cumene)	ND	5
1,1,2,2- Tetrachloroethane	ND	5	m and p-Xylene	ND	5
1,1,2-Trichloroethane	ND	5	Methylene chloride	ND	5
1,1-Dichloroethane	ND	5	Methyl-tert-butylether	ND	5
1,1-Dichloroethene	ND	5	Naphthalene	ND	5
1,1-Dichloropropene	ND	5	n-Butylbenzene	ND	5
1,2,3-Trichlorobenzene	ND	5	n-Propylbenzene	ND	5
1,2,3-Trichloropropane	ND	5	o-Xylene	ND	5
1,2,4-Trichlorobenzene	ND	5	p-Isopropyltoluene	ND	5
1,2,4-Trimethylbenzene	ND	5	sec-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5	Styrene	ND	5
1,2-Dibromoethane	ND	5	tert-Butylbenzene	ND	5
1,2-Dichlorobenzene	ND	5	Tetrachloroethene	ND	4
1,2-Dichloroethane	ND	5	Toluene	ND	5
1,2-Dichloropropane	ND	5	trans-1,2-Dichloroethene	ND	5
1,3,5-Trimethylbenzene	ND	5	trans-1,3-Dichloropropene	ND	5
1,3-Dichlorobenzene	ND	5	Trichloroethene	ND	5
1,3-Dichloropropane	ND	5	Trichlorofluoromethane	ND	5
1,4-Dichlorobenzene	ND	5	Vinyl chloride	ND	5
2,2-Dichloropropane	ND	5			

ND: non-detect
EPA Flag: none

SilverState Analytical Laboratories

CHAIN-OF-CUSTODY RECORD

5070 South Arville, Suite 6, Las Vegas, Nevada 89118
Phone: (702) 873-4478 Fax: (702) 873-7967

Page _____ of _____

Project/Job #:

Payment Method/PO #:

SEND INVOICE TO:
Name:
Company: Lake Las Vegas
Mailing Address: 1605 Lake Las Vegas Parkway
City, State, Zip: Henderson, NV 89011

REPORT RESULTS TO:
Name: Jennifer Bay
Company: Lake Las Vegas
Mailing Address: 1605 Lake Las Vegas Parkway
City, State, Zip: Henderson, NV 89011
Phone: Fax:

Sampled By: Lake Las Vegas
Report Attention: Jennifer Bay
On-Site pH/Temperature:

Turnaround Time (Specify Below with an X):
Standard 10 Business Days: ☐
Rush: 24h | 48h | 72h | Other
NOTE: A surcharge is applied for rush samples

Other Pertinent Info: ANNUAL TOXIC ORGANICS SCREEN

ANALYSES REQUESTED

Date Sampled	Time Sampled	Sample Location/ Sample ID	Silver State Lab ID	Comp/ Grab	Matrix*	Preservative	Number/Type of Containers**	608 (PEST/PCB)	8260 (VOC)	8270 (SVOC)	8151 (Herbicides)	Nitrite, Turbidity								
5 DEC 07	1240	LLV-1A 0 m	3693-1	G	AQ	varies		X	X	X	X	X								
↓	1255	LLV-1A 20 m	-2	G	AQ	varies		X	X	X	X	X								

Circle Applicable Program: SDWA CWA RCRA Other

Reporting requirements: RL MDL PQL

Report Level: I II III IV

*Metals:

Tampering with sample name, date, time, and location may constitute fraud

Relinquished by: Signature/Print:

Time/Date:

Received by: Signature/Print: S. Nelson

Time/Date: 1700 12/5/07

Method of Delivery:

Receiving Laboratory:

Special Instructions:

Authorized by: _____ Date: _____
Authorization is required to process samples. This obligates your organization for fee pertaining to services rendered. If collections or legal services are required to recover said fees, your organization will be responsible for all fees and cost in addition to service fees.

Note: Samples are disposed 30 days after results are reported. Samples deemed hazardous are returned to the client upon completion of analysis.

* Key: AQ – Aqueous S – Soil W – Waste OT – Other

** Key: P – Plastic G – Glass V – VOA Vial OT – Other

Anatek Labs, Inc.

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Client:	SILVER STATE ANALYTICAL LABS	**Batch #:**	071207003
Address:	5070 S. ARVILLE STE. 6 LAS VEGAS, NV 89118	**Project Name:**	EPA 608/8270/8151
Attn:	RON WINTER		

Analytical Results Report

Sample Number	071207003-001	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A OM / 3693-1	**Sampling Time**	12:40 PM	**Extraction Date**	12/12/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
4,4'-DDD	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
4,4'-DDE	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
4,4'-DDT	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Aldrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
alpha-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Aroclor 1016 (PCB-1016)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1221 (PCB-1221)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1232 (PCB-1232)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1242 (PCB-1242)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1248 (PCB-1248)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1254 (PCB-1254)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1260 (PCB-1260)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
beta-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Chlordane	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
delta-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Dieldrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan I	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan II	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan sulfate	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin aldehyde	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin ketone	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	

Comments:

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Client: SILVER STATE ANALYTICAL LABS
Address: 5070 S. ARVILLE STE. 6
LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-001	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007 11:15 AM
Client Sample ID	LIV-1A OM / 3693-1	**Sampling Time**	12:40 PM	**Extraction Date**	12/12/2007
Matrix:	Water	**Sample Location**			

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
gamma-BHC (Lindane)	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Heptachlor	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Heptachlor epoxide	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Methoxychlor	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Toxaphene	ND	ug/L	0.1	12/13/2007	SAT	EPA 608	

Surrogate Data

Sample Number 071207003-001

Surrogate Standard	Method	Percent Recovery	Control Limits
DCB	EPA 608	67.0	30-130

Comments:

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LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A 2OM / 3693-2	**Sampling Time**	12:55 PM	**Extraction Date**	12/12/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
4,4'-DDD	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
4,4'-DDE	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
4,4'-DDT	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Aldrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
alpha-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Aroclor 1016 (PCB-1016)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1221 (PCB-1221)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1232 (PCB-1232)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1242 (PCB-1242)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1248 (PCB-1248)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1254 (PCB-1254)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
Aroclor 1260 (PCB-1260)	ND	ug/L	0.2	12/13/2007	SAT	EPA 608	
beta-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Chlordane	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
delta-BHC	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Dieldrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan I	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan II	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endosulfan sulfate	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin aldehyde	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Endrin ketone	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
gamma-BHC (Lindane)	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	

Comments:

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Address: 5070 S. ARVILLE STE. 6
LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A 2OM / 3693-2	**Sampling Time**	12:55 PM	**Extraction Date**	12/12/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Heptachlor	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Heptachlor epoxide	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Methoxychlor	ND	ug/L	0.01	12/13/2007	SAT	EPA 608	
Toxaphene	ND	ug/L	0.1	12/13/2007	SAT	EPA 608	

Surrogate Data

Sample Number 071207003-002

Surrogate Standard	Method	Percent Recovery	Control Limits
DCB	EPA 608	60.8	30-130

Authorized Signature

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Comments:

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Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-001	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A OM / 3693-1	**Sampling Time**	12:40 PM	**Extraction Date**	12/10/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Chlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Nitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chloroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Nitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Acenaphthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Acenaphthylene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Aniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Comments:

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Client: SILVER STATE ANALYTICAL LABS
Address: 5070 S. ARVILLE STE. 6
LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-001	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007 11:15 AM
Client Sample ID	LIV-1A OM / 3693-1	**Sampling Time**	12:40 PM	**Extraction Date**	12/10/2007
Matrix:	Water	**Sample Location**			

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzidine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzyl alcohol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Carbazole	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Chrysene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dibenzofuran	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Diethylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dimethylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Fluorene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachloroethane	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Isophorone	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Naphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Nitrobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Pentachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Phenanthrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Comments:

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Client:	SILVER STATE ANALYTICAL LABS	**Batch #:**	071207003
Address:	5070 S. ARVILLE STE. 6 LAS VEGAS, NV 89118	**Project Name:**	EPA 608/8270/8151
Attn:	RON WINTER		

Analytical Results Report

Sample Number	071207003-001	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007 11:15 AM
Client Sample ID	LIV-1A OM / 3693-1	**Sampling Time**	12:40 PM	**Extraction Date**	12/10/2007
Matrix:	Water	**Sample Location**			

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Pyridine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Surrogate Data

Sample Number 071207003-001

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270C	92.8	10-123
2-Fluorobiphenyl	EPA 8270C	86.8	19-130
2-Fluorophenol	EPA 8270C	76.5	21-110
Nitrobenzene-d5	EPA 8270C	101.8	25-130
Phenol-d5	EPA 8270C	74.7	10-110
Terphenyl-d14	EPA 8270C	105.2	10-125

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Address: 5070 S. ARVILLE STE. 6
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Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A 20M / 3693-2	**Sampling Time**	12:55 PM	**Extraction Date**	12/10/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Chlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
2-Nitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
3-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chloroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Nitroaniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
4-Nitrophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Acenaphthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Acenaphthylene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Aniline	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzidine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Comments:

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Client: SILVER STATE ANALYTICAL LABS
Address: 5070 S. ARVILLE STE. 6
LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A 2OM / 3693-2	**Sampling Time**	12:56 PM	**Extraction Date**	12/10/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Benzyl alcohol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Carbazole	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Chrysene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dibenzofuran	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Diethylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Dimethylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Fluoranthene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Fluorene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Hexachloroethane	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Isophorone	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Naphthalene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Nitrobenzene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Pentachlorophenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Phenanthrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Phenol	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	
Pyrene	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Comments:

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Client: SILVER STATE ANALYTICAL LABS
Address: 5070 S. ARVILLE STE. 6
LAS VEGAS, NV 89118
Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007 11:15 AM
Client Sample ID	LIV-1A 2OM / 3693-2	**Sampling Time**	12:55 PM	**Extraction Date**	12/10/2007
Matrix:	Water	**Sample Location**			

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Pyridine	ND	ug/L	0.5	12/14/2007	EMP	EPA 8270C	

Surrogate Data

Sample Number 071207003-002

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270C	89.0	10-123
2-Fluorobiphenyl	EPA 8270C	85.5	19-130
2-Fluorophenol	EPA 8270C	77.5	21-110
Nitrobenzene-d5	EPA 8270C	103.1	25-130
Phenol-d5	EPA 8270C	74.3	10-110
Terphenyl-d14	EPA 8270C	104.0	10-125

Authorized Signature

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Comments:

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Attn: RON WINTER

Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number 071207003-001
Client Sample ID LIV-1A OM / 3693-1
Matrix: Water

Sampling Date 12/5/2007
Sampling Time 12:40 PM
Sample Location

Date/Time Received 12/7/2007 11:15 AM
Extraction Date 12/12/2007

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
2,4,5-T	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4,5-TP (Silvex)	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4-D	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4-DB	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dacthal	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dalapon	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dicamba	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dichloroprop	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dinoseb	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
MCPA	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Pentachlorophenol	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Picloram	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	

Surrogate Data

Sample Number 071207003-001

Surrogate Standard	Method	Percent Recovery	Control Limits
3,5-Dichlorobenzoic Acid	EPA 8151A	94.5	35-145

Comments:

Thursday, December 20, 2007

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LAS VEGAS, NV 89118
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Batch #: 071207003
Project Name: EPA 608/8270/8151

Analytical Results Report

Sample Number	071207003-002	**Sampling Date**	12/5/2007	**Date/Time Received**	12/7/2007	11:15 AM
Client Sample ID	LIV-1A 20M / 3693-2	**Sampling Time**	12:55 PM	**Extraction Date**	12/12/2007	
Matrix:	Water	**Sample Location**				

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
2,4,5-T	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4,5-TP (Silvex)	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4-D	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
2,4-DB	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dacthal	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dalapon	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dicamba	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dichloroprop	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Dinosob	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
MCPA	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Pentachlorophenol	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	
Picloram	ND	ug/L	0.1	12/16/2007	SAT	EPA 8151A	

Surrogate Data

Sample Number 071207003-002

Surrogate Standard	Method	Percent Recovery	Control Limits
3,5-Dichlorobenzoic Acid	EPA 8151A	99.6	35-145

Authorized Signature

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Comments:

Thursday, December 20, 2007