AQUATIC CONSULTING & TESTING, INC.

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Lic. No. AZ0003

29 December 2017

Ms. Debbie Tribioli
The Oasis at Anozira
c/o Kinney Management Services
6303 South Rural Road
Tempe, Arizona 85283

Ref: Oasis Lake, November 2017

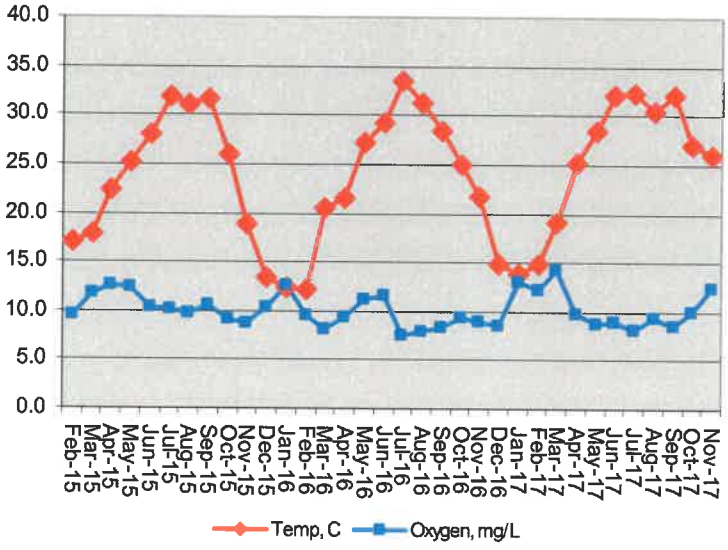
Dear Ms. Tribioli:

The following report summarizes water quality data collected for Oasis Lake on 01 November 2017. Similar data have been reported each month and are used in this report to generate the graphs that are used for tracking changes in water quality. The report includes field data sheets reflecting weekly lake and mechanical system conditions during the month.

Chemical and Physical Composition

Temperature, Oxygen, and pH: Water temperature decreased to 26.0 C (79 F) and the dissolved oxygen concentration remained relatively high at 12.3 mg/L. At the time of sampling, the oxygen saturation was >100 percent, indicating very good oxygenation and adequate operation of the aeration system. The dissolved oxygen content was also satisfactory for the fishery.

2015-2017 Temperature and Oxygen

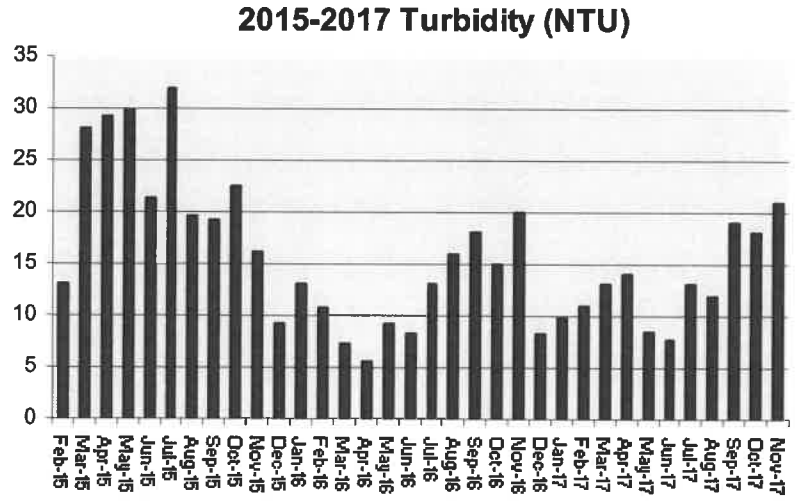


The table below shows the USEPA criteria for dissolved oxygen in warm water fisheries.

Criterion	Early life stages	Other life stages
Daily mean	>6.0	>4.0
Daily minimum	>5.0	>3.0

Water temperature tolerance varies among fish species. However, the maximum weekly temperature tolerance of most common urban lake fish species is 32 to 35 C.

Turbidity: The turbidity of the lake water increased slightly to 21 NTU. Water turbidity is impacted by dissolved and particulate matter in the water, including the dye that is now periodically added for algae and weed management. As turbidity increases, clarity decreases. Accordingly, water clarity declined slightly during November.



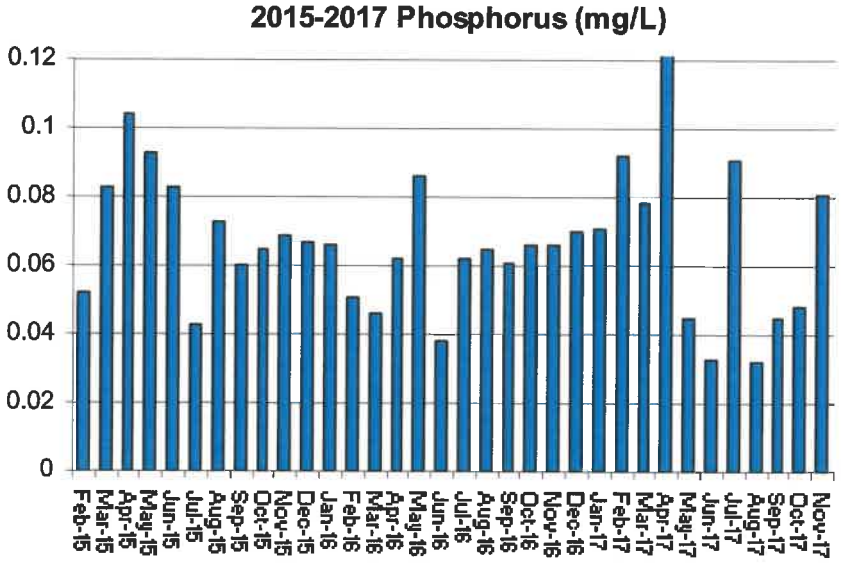
pH: The lake water pH was fairly stable at 8.8 SU. Water pH is influenced by the chemical makeup of the water and the amount of algae in the lake. In a very simplified explanation for the role of algae, carbonic acid in the water is formed from dissolution of carbon dioxide. Carbonic acid tends to make the water more acidic and pH decreases. However, algae utilize carbon dioxide during photosynthesis during daylight, making less carbon dioxide available to form carbonic acid, and pH increases. The more algae present, the greater the increase in pH that usually occurs.

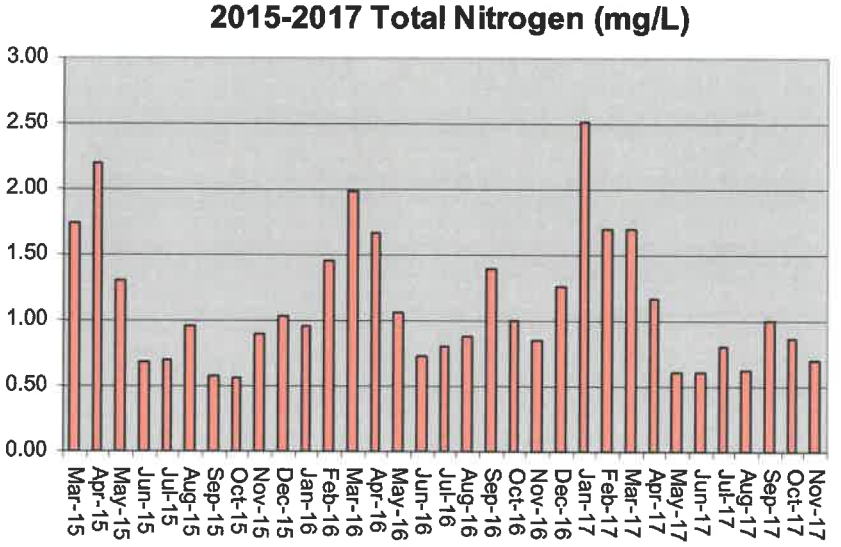
High pH can be problematic in terms of toxicity if high concentrations of ammonia are present in the water. Ammonia is in equilibrium between two forms; ammonium ion and ammonia gas. At pH concentrations above 9.0 SU and a water temperature increases, ammonia converts to the gas which is toxic to many aquatic organisms. At the measured pH and water temperature, toxicity would not be expected to develop. There were no signs of fish stress observed.

Nutrients: Nitrogen and phosphorus are the primary nutrients that stimulate algae and submerged plant growth. Phosphorus is typically the nutrient that dictates how much plant growth can be sustained in a lake. Usually if the total phosphorus concentration is below 0.030

mg/L, low levels of suspended algae occur. A nitrogen concentration of about 10 times the phosphorus (0.30 m/L) is typically needed to support algal growth.

The phosphorus concentration increased significantly to 0.081 mg/L as P. The total nitrogen concentration decreased to 0.70 mg/L as N. These data indicate that the lake had an overall increase in nutrients. Usually a nutrient increase results in an increase in algae growth. However, the phytoplankton data presented below indicate no significant change in the amount of algae. Cooler water temperatures and shorter hours of daylight likely influence the algae growth rate.



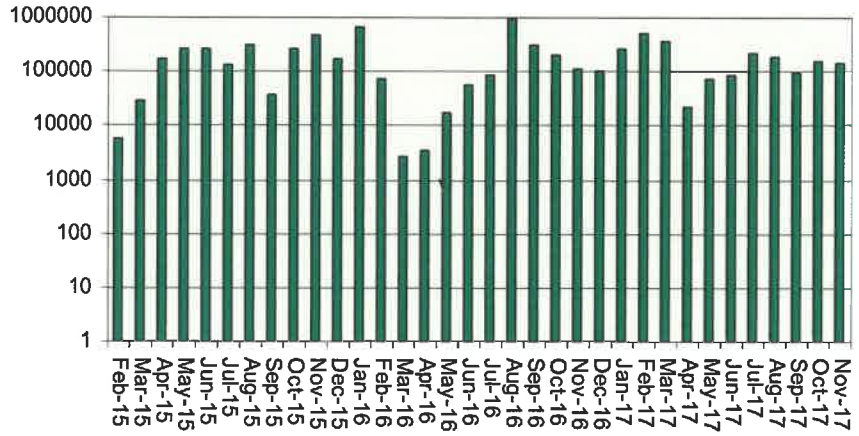


Biological Composition

Phytoplankton (algae): The amount and types of algae in a lake dictate the aesthetic and operational quality of the water. Algae density affects the clarity and color of the water, two very important aesthetic criteria. The species composition dictates the form of growth observed; floating mats, suspended cells, stringy attached filaments, etc. It also impacts the choice, frequency, and dosage of herbicides used for water quality management.

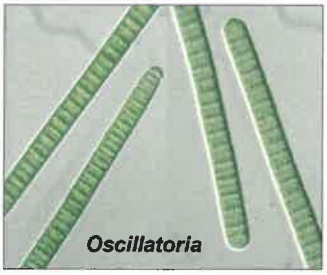
The total algae density in the lake decreased slightly to 1.48 x 10^5 cells per mL, a density considered slightly elevated for an urban reservoir in metro-Phoenix. Blue-green (Cyanophyta) algae continued to comprise the majority of the algae population. The often problematic blue-green filament and colonies, *Oscillatoria* and *Microcystis*, remained. However, no significant algae issues were encountered.

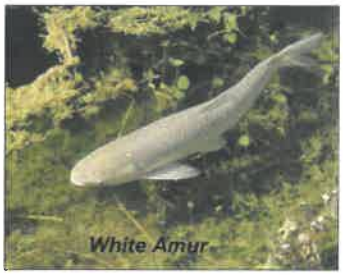
2015-2017 Algae Density (log-cells/mL)



The dominant algae in Oasis Lake was Microcystis, although *Oscillatoria* remained in high proportion. These are colonial and filamentous, respectively; blue-green (Cyanophyta) forms. The filaments can produce carpet-like growths on the bottom sediment layer, floating mats on the water surface, or stringers along the lake edge. Only minor edge growth was evident, supporting the continued use of lake dye to reduce light penetration. Lake dye also forces the White Amur (herbivorous fish) to feed higher in the water column and feed on the edge growths. Colonies can often accumulate in downwind coves, but this was not a significant problem during the reporting period.

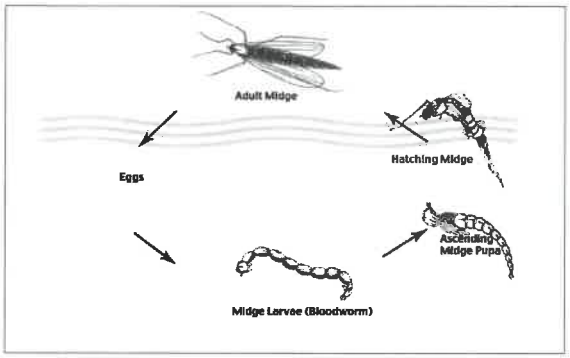
The potentially toxic (to fish) alga, *Prymnesium parvum*, was detected at a low density last month, but was absent from samples during November. No mortality or abnormal fish activity was observed. The presence of the alga will be closely monitored to determine if chemical remediation is required.





Submerged weeds were not detected in the lake. No algaecide or herbicide applications were required during the month.

Midge flies: Midge flies are common inhabitants of most lakes. Adult females lay hundreds of eggs on the water surface. The eggs settle to the lake bottom and hatch in a few days. Larvae develop and grow in the superficial sediments over a three to four week period. In about 30 days the insect larvae become pupae, rise in the water column, and emerge as adult flies. The life cycle is shown diagrammatically at right. The Adults tend to swarm at dusk and dawn and become a nuisance. They fly into residents' eyes and mouths, congregate under eaves of houses, and leave a sticky messy residue when they die. Management techniques may include stocking of bottom-feeding fishes to consume the larvae and/or application of bacterial or chemical larvicides.



Although air and water temperatures increased, few adult midge flies were detected during the month.

Fishery: Fish activity appeared normal. No dead fish were observed or reported during the month.

Waterfowl: Ducks and geese can be a beautiful sight on a small urban pond or lake. They seem to make the lake look more like a natural lake than an artificial reservoir. They are fascinating creatures. However, when ducks and geese become too numerous, several lake management and aesthetic problems can develop. These problems are listed below.

- Bird wastes are unattractive and cause slippery conditions.
- Cleaning waste from sidewalks and turf is an additional maintenance item.
- Geese and other waterfowl can become aggressive toward humans.
- Waterfowl can damage turf areas.
- Waterfowl add nitrogen and phosphorus to the water.
- Bird wastes contain bacteria that are a health risk to humans and pets.
- Diving birds consume fish that are stocked in the lack for management purposes.

Arizona Game and Fish Department has developed the following criteria for waterfowl on small urban lakes.

Excellent	<3/acre
Good	3-4/acre
Fair	5-6/acre
Poor	>6/acre

Based on the Arizona Game & Fish Department scale, the lake condition in terms of waterfowl remained in the "excellent" category during October with about one (1) duck per acre. Cormorants and Canada geese were rarely observed. Cormorants are diving birds that feed on small fish. Canada geese destroy turf and contribute fecal matter to the common areas and water.

In terms of public health protection, *E. coli* bacteria concentration was 75 per 100 mL. State swimming standard (full body contact) for *E. coli* is a maximum of 235 and the incidental or partial body contact standard is a maximum of 575 per 100 mL. The lake water met both standards.

Mechanical Systems and Field Observations

Weekly field inspection forms are attached to this report. All equipment was operational. Granular sodium peroxycarbonate additions were made to the entry water features to reduce organic sludge build up and to remove slime from the exposed surfaces.

Chemical/Biological Product Applications

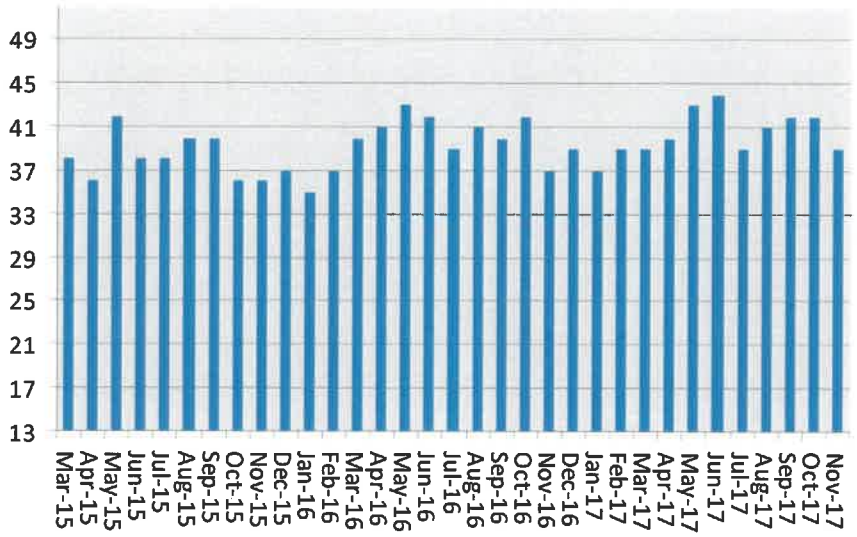
No registered herbicide or pesticide applications were made to the lake during the month.

Lake Report Card

The water quality data are summarized on the attached Oasis Lake Report Card. Each salient parameter has been qualitatively evaluated and then assigned a numeric value for quantitative comparison and tracking purposes. The overall November rating (39) represents a decrease in water quality, but remains in the "good" category. The decrease was primarily due to the increase in phosphorus, turbidity, and bacteria.

Report card scores for the past two years are summarized below. Data indicate a similar variability in water quality scoring in 2015 and 2016, and a cyclic pattern.

2015-2017 Report Card Scores



Respectfully,

AQUATIC CONSULTING & TESTING, INC.

Frederick A. Amalfi, Ph.D., C.L.M.
Laboratory Director

North American Lake Management Society
NALMS
Frederick A. Amalfi, Ph.D.
Nationally Certified
91-01M
Certified Lake Manager

LABORATORY REPORTS

FIELD INSPECTION FORMS

PESTICIDE APPLICATION DOCUMENTS

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Lic. No. AZ0003

LABORATORY REPORT

Client: Oasis at Anozira
c/o Kinney Management Services
6303 S. Rural Road
Tempe, Arizona 85283
Attn: Debbie Tribioli

Date Submitted: 11/01/17
Date Reported: 01/02/18

Project: Monthly Lake Monitoring

RESULTS

Client ID: Lake
ACT Lab No.: BZ12237

Sample Type: Surface Water
Sample Time: 11/01/17 08:10

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Algae Count	11/17/17	11/17/17	SM 10200 F	See Attached	cells/mL
Algae Identification	11/17/17	11/17/17		See Attached	
Golden Algae	11/01/17	11/01/17	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	11/01/17	11/01/17	SM4500 O G	12.3	mg/L as O2
pH, Field	11/01/17	11/01/17	SM4500H+ B	8.8	SU
Temperature, Field	11/01/17	11/01/17	SM2550 B	22.0	C
Nitrate + Nitrite - N	11/22/17	11/22/17	SM4500NO3 E	<0.05	mg/L as N
Phosphorus, Total	11/17/17	11/18/17	365.3	0.081	mg/L as P
Total Kjeldahl Nitrogen	11/10/17	11/10/17	SMNorg C,NH3 C/D	0.7	mg/L as N
E. coli, Colilert	11/01/17	11/02/17	SM 9223 B	75	MPN/100 mL
Turbidity	11/01/17	11/01/17	180.1	21.	NTU

Reviewed by: Frederick A. Amalfi

Frederick A. Amalfi, Ph.D.
Laboratory Director

ALGAE IDENTIFICATION

AC&T Lab No.	BZ12237	Date Collected	11/01/17
Client I.D.	Oasis	Collected By	AC&T

Divisions: bac=Bacillariophyta; chl=Chlorophyta; cry=Chrysophyta; cyn=Cyanophyta; eug=Euglenophyta; hap=Haptophyta; pyr=Pyrrhophyta Forms: u=unicell; c=colony; f=filament; g= flagellate

Genus	Div.-Form	Rel. Count	Total per mL	Comp.	Genus	Div.-Form	Rel. Count	Total per mL.	Comp
Achnanthes	bac-u				***Microcystis***	cyn-c	225	78723	53.19%
Anabaena	cyn-f				*Microspora*	chl-f			
Ankistrodesmus	chl-u	4	1400	0.95%	*Mougeotia*	chl-f			
Aphanocapsa	cyn-c				***Navicula***	bac-u	1	350	0.24%
Asterionella	bac-c				*Nitzschia*	bac-u			
Botryococcus	chl-c				***Oocystis***	chl-c	3	1050	0.71%
Carteria	chl-ug				***Oscillatoria***	cyn-f	130	45485	30.73%
Cephalomonas	chl-ug				*Pandorina*	chl-cg			
Ceratium	pyr-ug				*Pediastrum*	chl-c			
Chlamydomonas	chl-ug				***Peridinium***	pyr-ug	3	1050	0.71%
Chlorella	chl-u	6	2099	1.42%	*Phacotus*	chl-ug			
Chlorococcum	chl-c				*Phacus*	chl-ug			
Chroococcus	cyn-c				*Pinnularia*	bac-u			
Chroomonas	crp-ug	2	700	0.47%	*Pithophora*	chl-f			
Closterium	chl-u				*Prymnesium*	hap-ug			
Cocconeis	bac-u	1	350	0.24%	*Rhizoclonium*	chl-f			
Coelastrum	chl-c	16	5598	3.78%	*Rhoicosphenia*	bac-u			
Cosmarium	chl-u				*Rhopalodia*	bac-u			
Cosmocladium	chl-c				***Scenedesmus***	chl-c	8	2799	1.89%
Crucigenia	chl-c				*Scytonema*	chl-f			
Cryptomonas	crp-ug				*Selanastrum*	chl-u			
Cyclotella	bac-u				*Sphaerocystis*	chl-c			
Cymbella	bac-u				*Spondylumorum*	chl-c			
Diatoma	bac-u				*Spirulina*	cyn-f			
Dinobryon	bac-c				*Staurastrum*	chl-u			
Dunaliella	chl-u				*Stephanodiscus*	bac-u			
Epithemia	bac-u				*Stigeoclonium*	chl-f			
Euglena	eug-ug				*Surirella*	bac-u			
Fragilaria	bac-u				*Synechococcus*	cyn-u			
Frustulia	bac-u				*Synechocystis*	cyn-c			
Glenodinium	pyr-ug				***Synedra***	bac-u	8	2799	1.89%
Golenkinia	chl-c				*Synura*	cry-cg			
Gomphonema	bac-u				*Tetraedron*	chl-u			
Gonium	chl-cg				*Tetrastrum*	chl-c			
Gonyaulax	pyr-ug				*Trachelomonas*	eug-ug			
Gyrosigma	bac-u				*Vaucheria*	chl-f			
Hydrodictyon	chl-c				*Volvox*	chl-cg			
Lyngbya	cyn-f				*Zygnema*	chl-f			
Melosira	bac-f								
Meridion	bac-u								
Merismopedia	cyn-c	16	5598	3.78%					

check 100.00%

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Count (cells/mL) 1.48E+05

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Chain of Custody

Client Project Info:

Monthly Lake Monitoring
Oasis at Anozira

AC&T Client Reporting Information:

Oasis at Anozira
c/o Kinney Management Services
Attn: Debbie Tribioli
6303 South Rural Road
Tempe, AAZ 85283
P: 480-820-3451
E: debbie@kinneymanagement.com

AC&T Sampler: Andrew Murrett

Sample Location ID:	Date:	Time:	Matrix:	NO3+NO2	Total Phosphorous (P-T)	Total Kjeldahl Nitrogen (TKN)			Total E.Coli -MPN			Turbidity			Algae Count & ID	Golden Algae	Field Measurements: pH, Temp, O2	Sample Containers # / Preservation: Non Preserved	Na2S2O3 (Sterile)	HNO3 (Nitric)	H2SO4 (Sulfuric)	Lugols	Other:	AC&T Laboratory Sample Identification
Lake	11/1/17	810	*SW*	X	X	X			X			X			X	X	X	3	2		1			BZ-12237

Page1 of 1

Project Location:	A C & T Sample Receipt:			1. RELINQUISHED BY:	3. RELINQUISHED BY:
Oasis at Anozira	Total # Containers:	7		Signature: Andrew Murrett	Signature:
PO#:	Custody Seals:	YES	NO	Print Name: Andrew Murrett	Print Name:
Lake Contract	Samples Intact:	YES	NO	Date: 11/1/17 Time: 1355	Date: Time:
Notes:	Samples On Ice:	YES	NO	**2. RECEIVED BY:**	**4. RECEIVED BY:**
1 preserved DW	Ice Type:	WET	BLUE	Signature:	Signature:
	Sample Receipt Temperature:	24C		Print Name:	Print Name:
				Date: 11-1-17 Time: 13:55	Date: Time:

022

OASIS AT ANOZIRA
FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 11/1/17
By: AM

Aeration System Operation

☑ operational ☐ Problem

Lake Surface

☐ Lake surface cleaning

Details: _____

_____

Floating Fountains ☑ West ☑ East ☑ South

☑ operational ☐ Problem Details: _____

Pump house ☑ housekeeping ☐ leaks ☐ ventilation ☐ lighting Notes_____

Compressors ☑ operational ☐ Problem Details: _____

Pumps ☑ operational ☐ Problem Details: _____

Entry Fountains

Elliot North: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Elliot South: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Los Feliz: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Monthly Chemistry & Biology

☑ Dissolved oxygen 12.3
☐ Temperature 72.0
☐ pH 8.8
☑ Algae ID and count
☐ Ammonia-N
☐ Organic N (TKN)
☑ Phosphorus
☐ Turbidity
☑ *E. coli*
☐ Golden algae (seasonal)

OASIS AT ANOZIRA
FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 11/8/17
By: DM

Aeration System Operation

☑ operational ☐ Problem

Lake Surface

☐ Lake surface cleaning

Details: _____

_____

Floating Fountains ☐ West ☑ East ☐ South

☑ operational ☐ Problem Details: _____

Pump house ☑ housekeeping ☐ leaks ☐ ventilation ☐ lighting Notes_____

Compressors ☑ operational ☐ Problem Details: _____

Pumps ☑ operational ☐ Problem Details: _____

Entry Fountains

Elliot North: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Elliot South: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Los Feliz: ☑ operational ☑ Screens cleared ☐ Problem Details:_____

_____

Monthly Chemistry & Biology

☑ Dissolved oxygen 12.7
☑ Temperature 23.3
☑ pH 8.9
☐ Algae ID and count
☐ Ammonia-N
☐ Organic N (TKN)
☐ Phosphorus
☐ Turbidity
☐ *E. coli*
☑ Golden algae (seasonal)

OASIS AT ANOZIRA
FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 11/15/17
By: AM

Aeration System Operation

☒ operational ☐ Problem

Details: _____

Lake Surface

☐ Lake surface cleaning

Floating Fountains ☑ West ☑ East ☑ South

☑ operational ☐ Problem Details: _____

Pump house ☑ housekeeping ☐ leaks ☐ ventilation ☐ lighting Notes _____

Compressors ☑ operational ☐ Problem Details: _____

Pumps ☑ operational ☐ Problem Details: _____

Entry Fountains

Elliot North: ☑ operational ☑ Screens cleared ☐ Problem Details: _____

Elliot South: ☑ operational ☑ Screens cleared ☐ Problem Details: _____

Los Feliz: ☑ operational ☑ Screens cleared ☐ Problem Details: _____

Monthly Chemistry & Biology

☒ Dissolved oxygen 12.4
☑ Temperature 20.5
☑ pH 8.9
☐ Algae ID and count
☐ Ammonia-N
☐ Organic N (TKN)
☐ Phosphorus
☐ Turbidity
☐ *E. coli*
☒ Golden algae (seasonal)

N W E S

OASIS AT ANOZIRA
FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 11/22/17
By: [illegible]

Aeration System Operation

☑ operational ☐ Problem

Details: _____

Lake Surface

☐ Lake surface cleaning

Floating Fountains ☐ West ☑ East ☐ South

☐ operational ☐ Problem Details: _____

Pump house ☑ housekeeping ☐ leaks ☐ ventilation ☐ lighting Notes _____

Compressors ☑ operational ☐ Problem Details: _____

Pumps ☑ operational ☐ Problem Details: _____

Entry Fountains

Elliot North: ☐ operational ☐ Screens cleared ☐ Problem Details: _____

Elliot South: ☑ operational ☑ Screens cleared ☐ Problem Details: _____

Los Feliz: ☐ operational ☐ Screens cleared ☐ Problem Details: _____

Monthly Chemistry & Biology

- ☑ Dissolved oxygen 10.6
- ☑ Temperature 18.4
- ☑ pH 9.0
- ☐ Algae ID and count
- ☐ Ammonia-N
- ☐ Organic N (TKN)
- ☐ Phosphorus
- ☐ Turbidity
- ☐ *E. coli*
- ☒ Golden algae (seasonal)