

# LAKE MEAD WATER QUALITY FORUM ALGAE TASK FORCE UPDATE



What A Difference 10 Years Makes

# TASK FORCE MEMBERS

**Bill Shepherd  
Dan Fischer  
David Wong  
Jon Sjoberg  
Kevin Eubanks  
Scott Schiefer  
Todd Tietjen  
Randy Pahl**

**Bryan Moore  
Dana LaRance  
Devon Morgan  
Kent Turner  
Peggy Roefer  
Steve Weber  
Doug Drury**

## Lake Mead Water Quality Forum

Member Organizations

### Algae Task Force

#### **Algae Task Force Summary — What Ten Years Has Taught Us**

The Algae Task Force (ATF) was originally formed as a subcommittee of the Lake Mead Water Quality Forum (Forum) to investigate the causes of a green algae bloom that occurred throughout Lake Mead in 2001. To be proactive, the Lake Mead Water Quality Forum reconvened the Algae Task Force in 2010 as a result of a golden algae bloom at Lake Las Vegas.

The Algae Task Force is composed of a variety of local, state and federal agencies, whose roles and responsibilities as related to the monitoring and reporting plan have been agreed upon as outlined below:

- Develop and distribute the Blue Green Algal Toxins Monitoring and Reporting Plan;
- Coordinate and conduct monitoring throughout Lake Mead, Lake Mohave and the Las Vegas Wash in accordance with this Plan;
- Provide regular updates of analytical information to the appropriate agencies and Lake Mead Water Quality Forum;
- Develop and distribute a Fact Sheet and/or additional outreach materials deemed necessary to raise public awareness regarding blue-green algae;
- Raise public awareness of and promote the use of Best Management Practices (BMPs) to minimize nutrients entering waterways;
- Respond to media inquiries seeking general information on algal blooms;
- Take action necessary to ensure that public health and safety is maintained as well as that of terrestrial and aquatic wildlife.



[Forum Home Page](#)

*Last updated 03/07/2013 16:33:40*

# PREVIOUS PRESENTATIONS

- ❑ 2011 Tri-State Seminar
- ❑ January 2012 – LMWQF
- ❑ February 2012 – SQMC
- ❑ 2012 Lake Mead Symposium

# 2010 ALGAE TASK FORCE

- ❑ Difficult to achieve a consensus on recommended future actions
- ❑ Instead, reviewed past and made observations

# NEWSPAPER ARTICLES

DATE	PUBLICATION	PAGES	TITLE
1/30/1955	LVRJ	2:3-6	Lake Mead Level at 1101 Feet, Lowest since 1938.....
5/11/1964	LVRJ	1:1-8	Colorado Water Curtailed By Udall
6/7/1964	LVRJ	13:3-6	Lake Lowering Effects Studied
1/8/1965	LVRJ	9:4-8	Photo at LV Wash showing low lake level
5/4/1967	LVRJ	1:4-8	Recreation Area Periled (Algae in Lake Mead)
11/12/1967	Nevadan	pp 4-5	Lake Mead Pollution Neglect
11/19/1967	Nevadan	pp 24-25	Lake Mead Pollution Neglect - part 2
5/12/1968	Nevadan	p 3	What's New On Vegas Wash Pollution
6/23/1968	Nevadan	pp 4-5	We Can Stop Polluting Lake Mead Now
2/15/1970	Nevadan	pp 30-31	Foxes in charge of the chicken coop
9/13/1970	Nevadan	pp 30-31	Las Vegas Valley sewage
4/4/1971	Nevadan	pp 4-5	How sick is Vegas Wash
5/7/1982	Sun	pp 18-19	Our \$60 Million Tidy Bowl
8/20/1982	Sun	p 13	State Commission Delays Approval On Las Vegas Wastewater
9/10/1982	LVRJ	1A	Officials Claim Lake Standards Too Costly
9/10/1982	Sun	p 15	State Oks Water Quality Standards
1/20/1997	LVRJ	online page	Eroding Wetlands May Affect Water Quality

# REFERENCES

REFERENCE NAME	DATE
A Mathematical Model of Primary Productivity & Limnological Patterns in Lake Mead	Jan-72
Addendum To The Environmental Assessment Annex B LV Wash/Bay Pollution Abatement Project	Jul-74
Analysis of the WQS Proposed by NDEP – Main Report and Appendices	Aug-87
Appendices for Water Quality Standards Study Report	Mar-82
Comprehensive Survey of Sedimentation in Lake Mead 1948-49	Feb-57
Draft Water Quality Standards Study Report	Mar-82
Environmental Assessment Las Vegas Wash and Bay Pollution Abatement Project Annex B	Nov-72
Evaluation of Alternates for Water Pollution Control and Resource Management Phase III LV Wash/Bay Pollution Abatement Project Annex C	Mar-72
Evaluation of TMDL & Associated WQS Attainment for LV Wash, Bay, & Lake Mead	Oct-03
Final Report - Lake Mead Monitoring Program	Jul-76
Future Quantity and Quality of Colorado River	Mar-65
Lake Mead Water Quality History: Technical Report No. 4	Nov-80
Las Vegas Bay Study - Report to the Enforcement Division, U.S. EPA, Region IX	Jan-73
Las Vegas Valley Water Quality Program Final Annual Progress Report	Oct-80
Las Vegas Wash & Lake Mead Proposed WQS Revisions/Rationale	May-87
Microbiological Limnological, Nutrient Evaluations of LV Wash-Bay System	Feb-02
Micronutrients and Biological Patterns in Lake Mead	Jan-71
Physical Limnology of Lake Mead	Oct-51
Report on Pollution in Las Vegas Wash and Las Vegas Bay	Jan-67
Report on Wastewater Disposal	Oct-76
Report to Governor & Legislative Commission Final Alternate Plan LV Wash-Bay Pollution Abatement Project	Jul-74
Technical Assistance Report to the State of Nevada Department of Health, Welfare, and Rehabilitation	May-70
The 1963-64 Lake Mead Survey	Aug-70
The Effect of Las Vegas Wash Effluent Upon The Water Quality In Lake Mead	Jan-71
The Issues with Banning Phosphate Detergents in Clark County	Jan-78
The Limnology In Reservoirs On The Colorado River Technical Report No. 11	Sep-83
Water Quality Study of Lake Mead Report No. ChE-70	Nov-67

# Lake Las Vegas

- ❑ Task Force reconvened in 2010 to study golden algae bloom in Lake Las Vegas and its potential impact on the Las Vegas Bay (Bay)
  - Seeding of the Bay with *Prymnesium parvum* is remotely feasible
  - Water quality conditions in the LV Bay are not favorable for growth

# Las Vegas Bay/Boulder Basin

- ❑ 2001 Task Force made recommendations for 10 activities to control future algae blooms
- ❑ 2010 Task Force addressed each one

## 1. Request Federal assistance to study the algae blooms

- Since 2001 there have been no further blooms to study

## 2. Assess nutrient loadings into the Bay during both wet and dry weather conditions

- Data available which describes Total P loading during dry weather conditions in the Lower Colorado River Regional Water Quality Database.
- Minimal data exists to characterize Total P loading from wet weather events
- 2010 Task Force conducted limited sampling of wet weather flows.
- Phosphorus loadings during wet weather events can be quite large.

### 3. Develop a model of the Bay to determine the assimilative capacity remaining in the Bay and the Boulder Basin

- CWC as part of SCOP project developed a model
- Did predict that Total P of <275 lbs would be needed to comply with the Chl-a WQS
- Did not address assimilative capacity remaining
- Did not address Total P loadings from wet weather flows
- Did not account for quagga mussels and their impact on the phytoplankton concentrations in Lake Mead
- Suggested WWTPs would need to lower TIN to <12 mg/L

#### 4. Begin year round phosphorus removal at WWTPs

- Began in November 2002
- Today WWTPs average Total P discharged < 300 lbs/day

#### 5. Conduct a Federally assisted study to determine the exact cause of the algae bloom

- Studies have not determine the exact cause
- Data collected during and prior to bloom is minimal
- Determinations of cause are multifaceted and complex and not possible with available data

6. Establish a working group to ensure that nutrient loadings are reduced from non-point sources

- A working group has not been established

7. Proceed with SCOP project as soon as possible

- SCOP project was deemed unnecessary
  - ✓ Economic climate of the Las Vegas valley
  - ✓ Optimized treatment by WWTPs

## 8. Increase sampling and water quality analysis for the Wash, the Bay, and Boulder Basin

- Sampling has increased since 2001
- All agencies are now contributing to the database
- More data exists to study an algae bloom should one occur

## 9. Study the nutrients in the sediments of the Bay

- Limited studies have been conducted

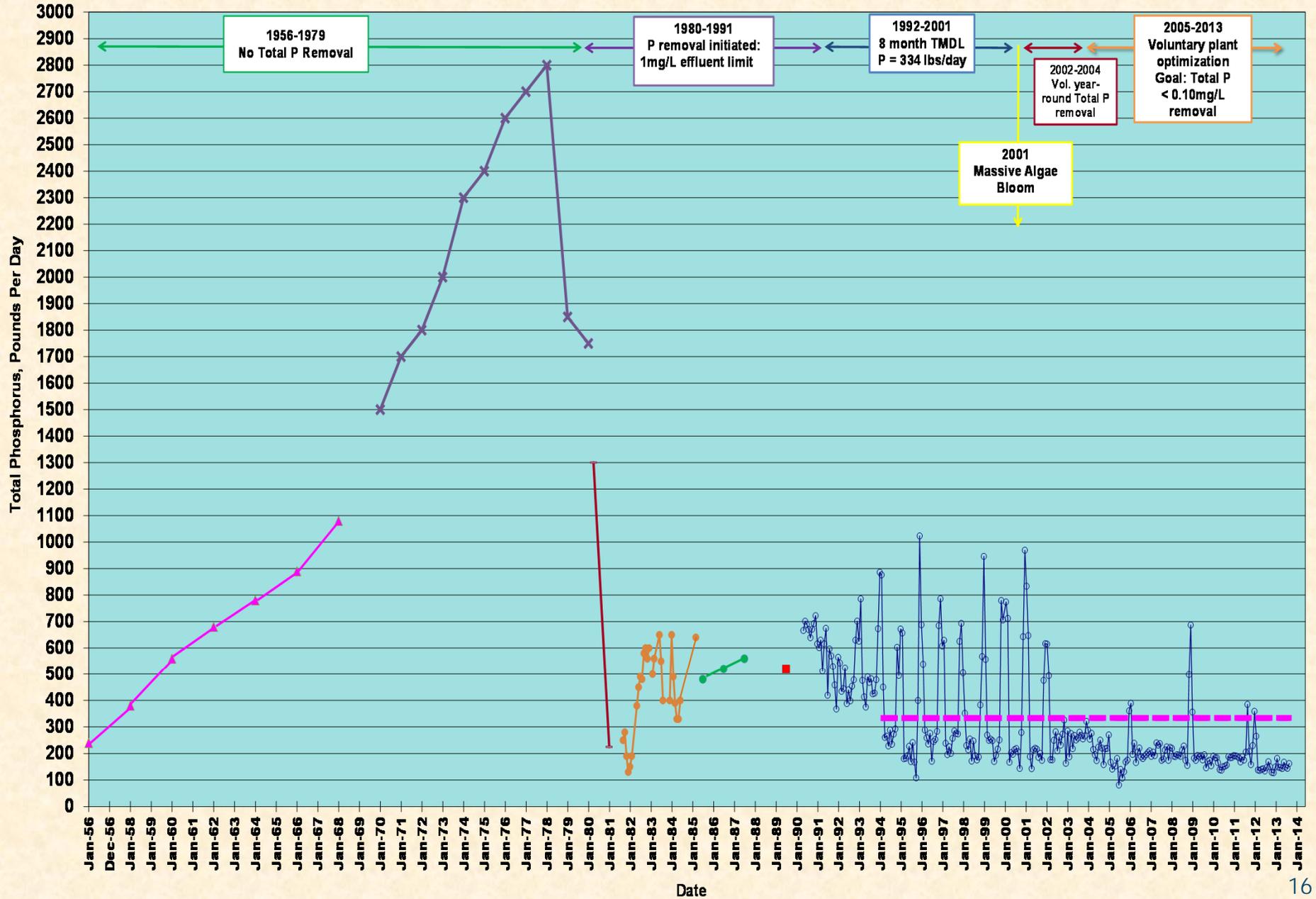
## 10. Conduct monthly meetings to review data and discuss possible solutions for algae control

- Frequent meetings held to discuss water quality in the Wash and Lake Mead

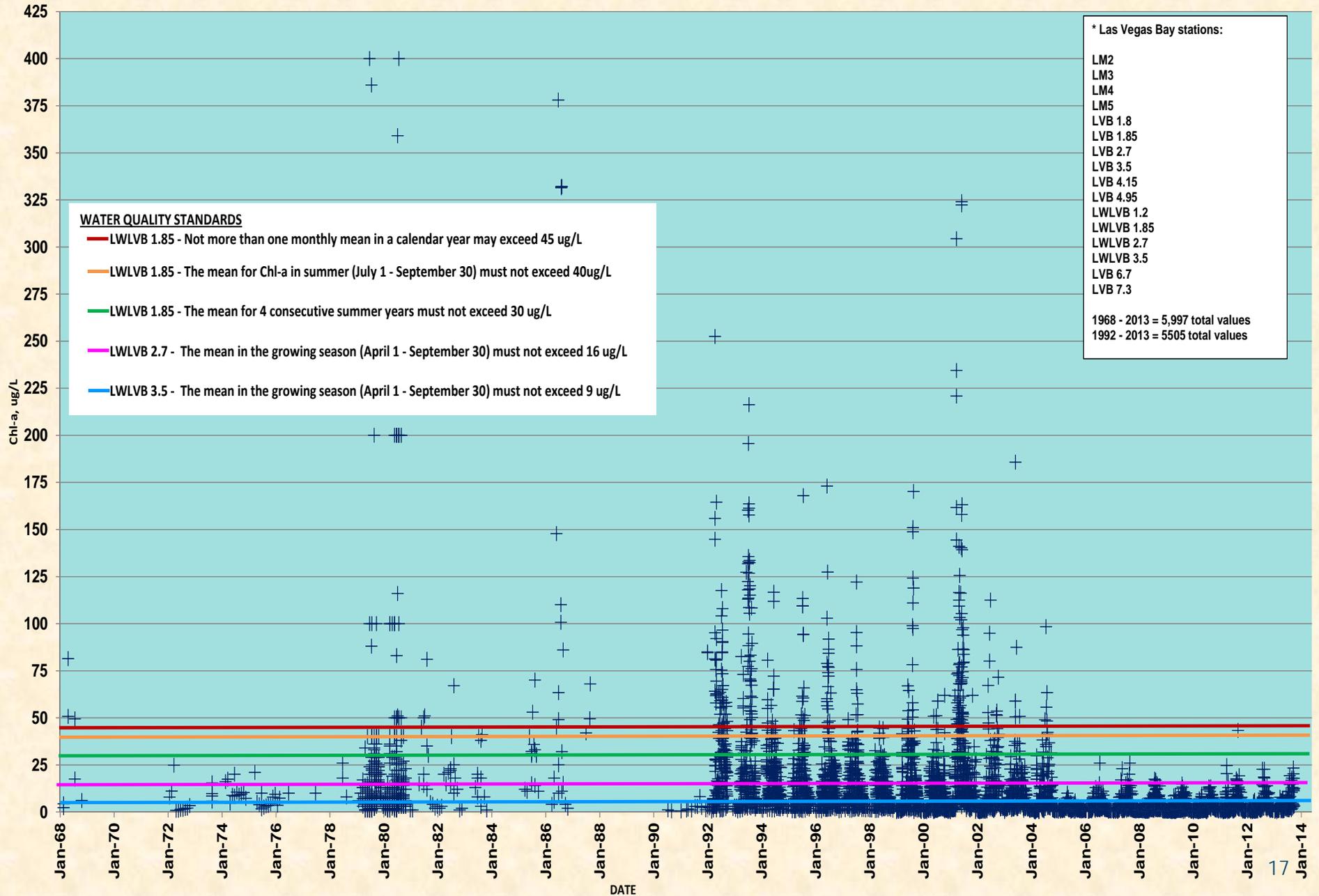
# Voluntary Total P Removal by Wastewater Agencies

- Actions in 2002 and 2005
- In 2002, year round wastewater Total P removal reduced Total P entering Lake Mead from ~430 lbs/day to < 300 lbs/day
- After plant optimization in 2005, Total P was about 200 lbs/day
- After 2005, the Bay and Boulder Basin were compliant with Chl-a WQS and concentrations lowest recorded
- After 2005, Total P was reduced to pre-1956 loadings

**ESTIMATED DISCHARGERS' EFFLUENT AVERAGE DAILY TOTAL PHOSPHORUS**  
 Discharged to Las Vegas Wash  
 Pounds per day



# Las Vegas Bay Chlorophyll-a, ug/L 1968-2013

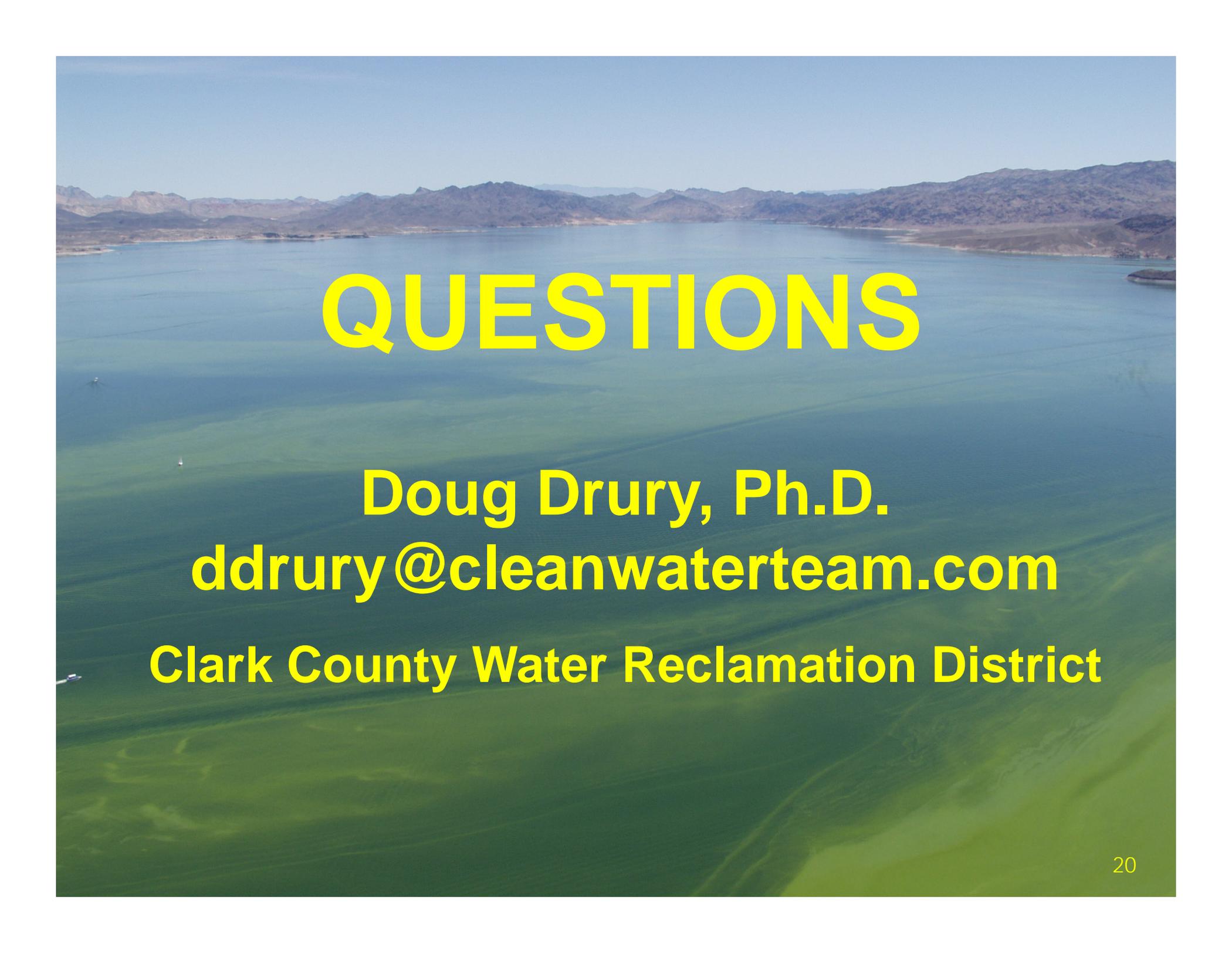


# Wet Weather Total P Loadings

- Continues to be a potential cause (trigger) for algae blooms in the Las Vegas Bay
- Data collected in 2010 shows that Total P for storms appears to be quite large
- Data is still sparse, but needs to be considered
- Recommend more data be collected to characterize phosphorus loadings from storm flows.
- Beware of warm spring rains

# For the future

- Provide more status reports? If so, to whom and how often?
- Continue to present information at conferences?



# QUESTIONS

**Doug Drury, Ph.D.**

**[ddrury@cleanwaterteam.com](mailto:ddrury@cleanwaterteam.com)**

**Clark County Water Reclamation District**