

Miner Lake Association Spring 2016 Meeting

May 28, 2016

Agenda

- ◆ Approve Minutes from Fall Meeting
- ◆ Treasurer Report
- ◆ Update on the Miner Lake Dam
- ◆ Water Quality Report and Monitoring for 2016
- ◆ Replacement of VP position
- ◆ Membership Topics and Q/A

Miner Lake Dam

- ◆ Legal review continues, but easement signed by most impacted property owners
- ◆ Adjustments made to limit risk of flooding
- ◆ Drain Commissioners expects work in 2016, but date is not yet established
- ◆ Review of assessment role to confirm all properties were included
- ◆ Will provide updates on the website as details emerge

Water Quality Report

- ◆ Performed by ProgressiveAE
- ◆ Covers calendar year 2015
- ◆ Will publish this presentation and the actual report to the Miner Lake website

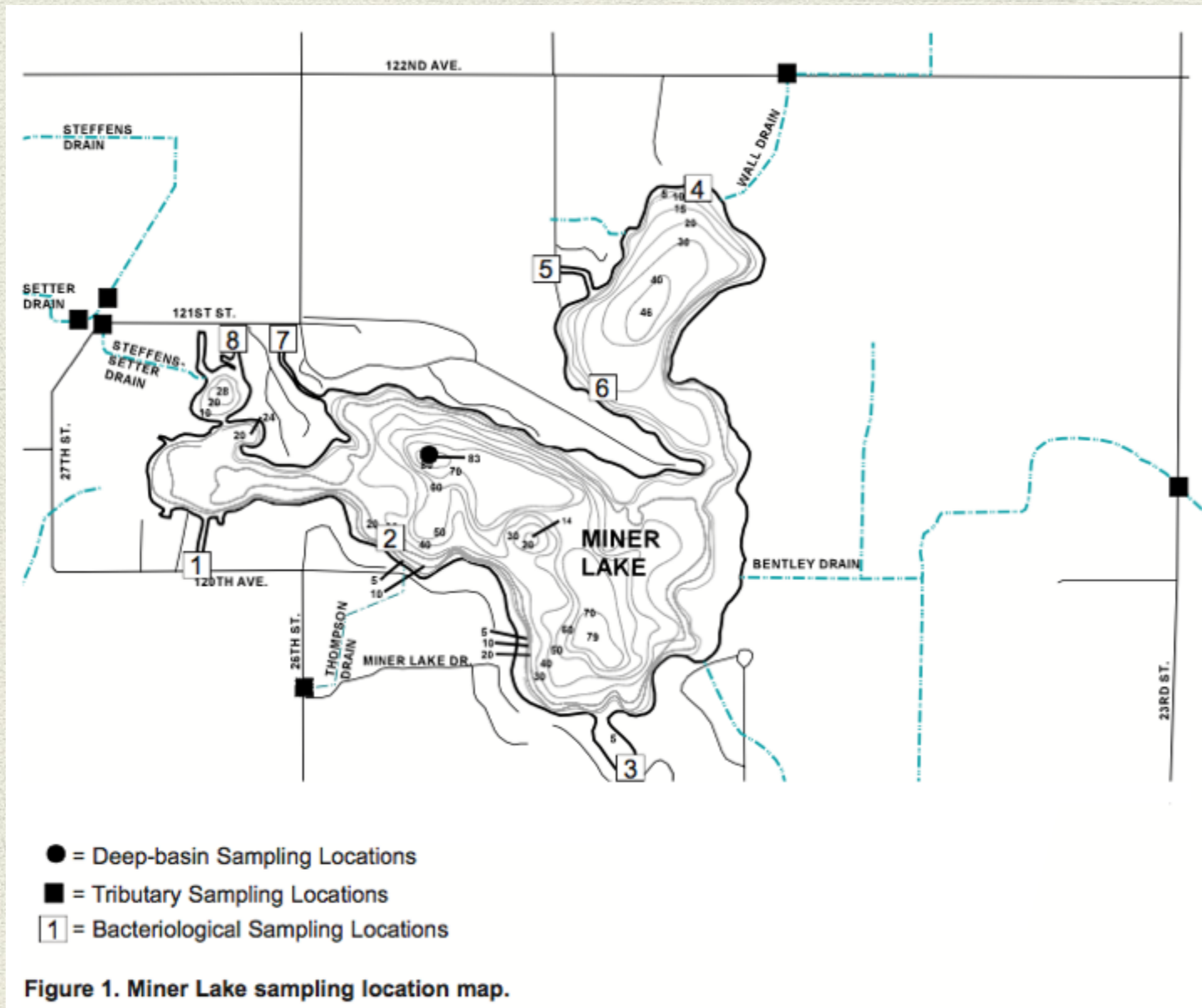
Water Quality - Summary

With respect to water quality, phosphorus and chlorophyll a readings in 2015 were low indicating good water quality. Secchi transparency readings in 2015 were not as good as 2014, and were similar to transparency readings taken in 2013.

Water Quality - Summary

Plant survey results indicate Miner Lake has a good diversity of aquatic plants with 14 native submersed aquatic plant species found in the lake in 2015. The two exotic plant species of concern, Eurasian milfoil and starry stonewort, were found at relative densities of 7.8% and 10.9% respectively in 2015, similar to what was observed in 2014. Thus, these exotic species do not appear to be spreading significantly in the lake although additional monitoring this year (2016) will give a better idea if a treatment program may be warranted.

Sample Locations



Lake Classification

TABLE 1
LAKE CLASSIFICATION CRITERIA

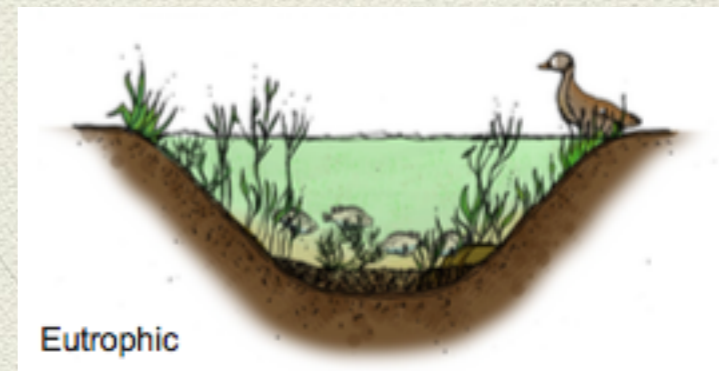
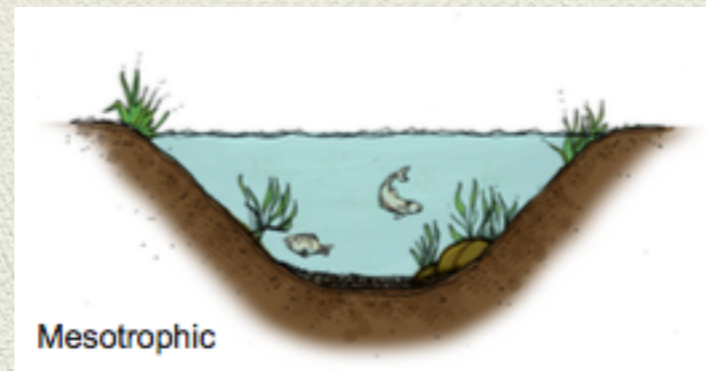
Lake Classification	Total Phosphorus ($\mu\text{g/L}$) ¹	Chlorophyll-a ($\mu\text{g/L}$) ¹	Secchi Transparency (feet)
Oligotrophic	Less than 10	Less than 2.2	Greater than 15.0
Mesotrophic	10 to 20	2.2 to 6.0	7.5 to 15.0
Eutrophic	Greater than 20	Greater than 6.0	Less than 7.5

Oligotrophic lakes are generally deep and clear with little aquatic plant growth. These lakes maintain sufficient dissolved oxygen in the cool, deep bottom waters during late summer to support cold-water fish such as trout and whitefish.

Eutrophic lakes have poor clarity and support abundant aquatic plant growth. In deep eutrophic lakes, the cool bottom waters usually contain little or no dissolved oxygen. Therefore, these lakes can only support warm-water fish such as bass and pike.

Lakes that fall between the two extremes of oligotrophic and eutrophic are called **mesotrophic** lakes.

Miner Lake is classified as **mesotrophic** based on measurements and observation.



Phosphorus

**TABLE 2
MINER LAKE 2015 DEEP BASIN WATER QUALITY DATA**

Date	Sample Depth (feet)	Temperature (°F)	Dissolved Oxygen (mg/L) ¹	Total Phosphorus (µg/L) ²	pH (S.U.) ³	Total Alkalinity (mg/L as CaCO ₃) ⁴
8-Apr-15	1	42	7.6	19	7.9	179
8-Apr-15	10	42	11.4	22	7.9	174
8-Apr-15	20	42	11.4	20	7.9	
8-Apr-15	30	42	11.6	18	7.8	182
8-Apr-15	40	42	11.6	16	7.8	181
8-Apr-15	50	41	11.3	24	7.8	187
8-Apr-15	60	40	9.3	19	7.6	186
8-Apr-15	70	39	6.7	22	7.5	192
8-Apr-15	80	38	5.2	39	7.3	193
17-Aug-15	1	81	9.3	6	9	163
17-Aug-15	10	78	9.7	<5	9	164
17-Aug-15	20	60	1.1	<5	8.1	198
17-Aug-15	30	48	1.3	<5	8	199
17-Aug-15	40	45	1.2	<5	8	201
17-Aug-15	50	44	1.2	23	8	199
17-Aug-15	60	44	0.9	37	7.9	203
17-Aug-15	70	44	1.0	59	7.9	204
17-Aug-15	80	43	1.2	160	7.9	208

Lake Classification	Total Phosphorus (µg/L) ¹
Oligotrophic	Less than 10
Mesotrophic	10 to 20
Eutrophic	Greater than 20

Spring Average = 22.00
Summer Average = 33.88

Overall Average = 28.00

Excluding Deep Values = 17.81

Water Clarity and Chlorophyll

TABLE 3
MINER LAKE 2015 SURFACE WATER QUALITY DATA

Date	Secchi Transparency (feet)	Chlorophyll-a ($\mu\text{g/L}$) ²
8-Apr-15	6.5	0
17-Aug-15	5.0	1

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LAKE CLASSIFICATION CRITERIA

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Historical Data

**TABLE 4
MINER LAKE SUMMARY STATISTICS, 1996-2015**

	Total Phosphorus ($\mu\text{g/L}$) ¹	Secchi Transparency (feet)	Chlorophyll-a ($\mu\text{g/L}$) ²
Average	47	8.9	2.0
Standard Deviation	78	2.2	2.3
Median	24	8.5	1.3
Minimum	5	5.0	0.0
Maximum	869	14.0	8.2
Number of Samples	224	24	26

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2015 Values =	28.00	0.5	5.75
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Historical Data - Charts

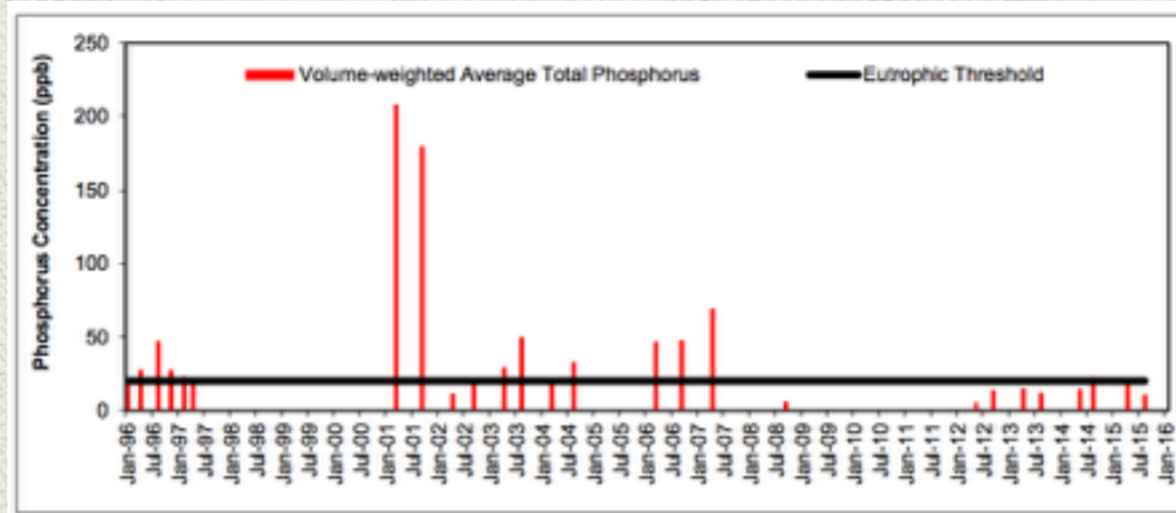


Figure 2. Volume-weighted average total phosphorus concentrations, 1996 - 2015.

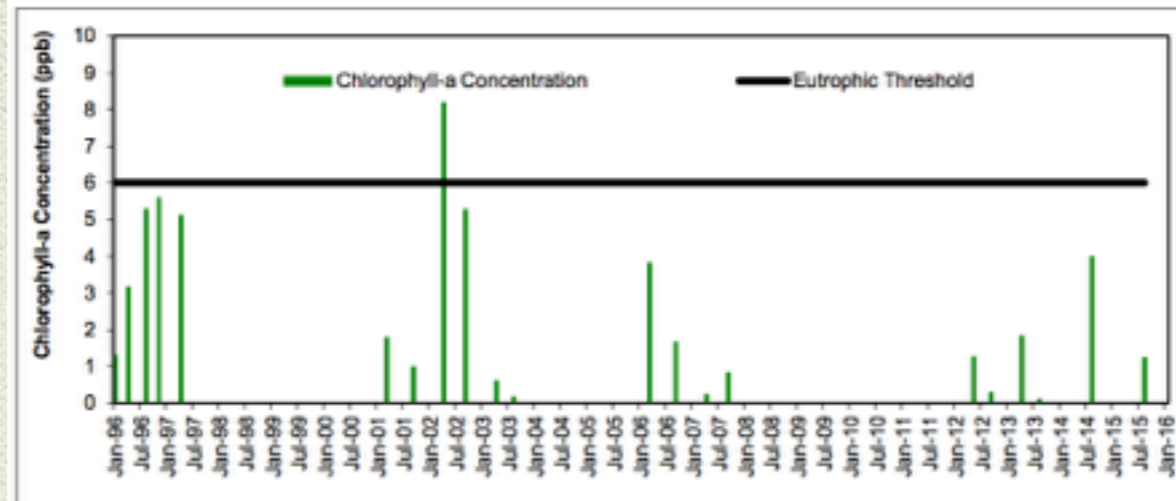


Figure 3. Chlorophyll-a concentrations, 1996 - 2015.

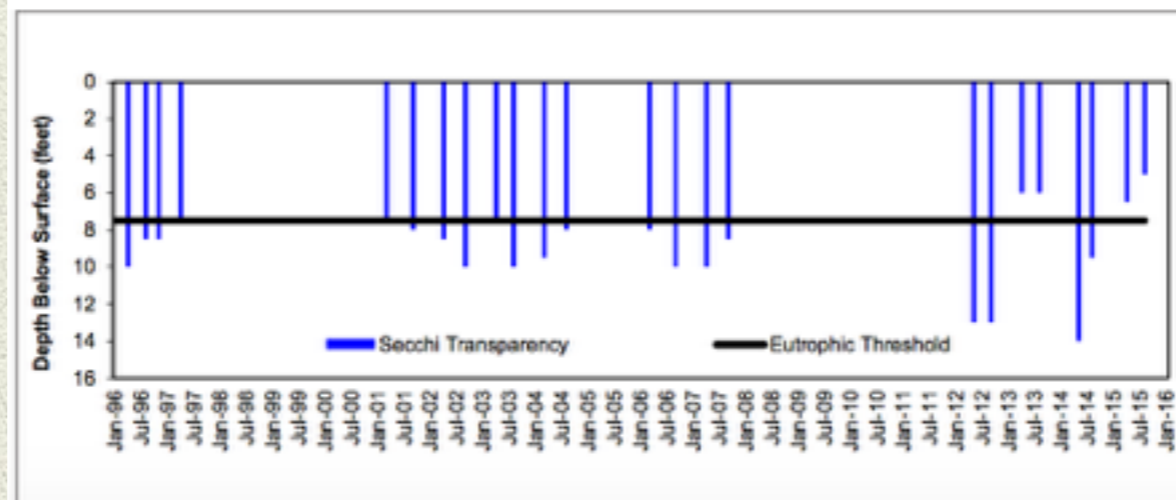


Figure 4. Secchi transparency measurements, 1996 - 2015.

Water Quality Monitoring 2016

- ◆ Contract with ProgressiveAE continues
- ◆ Begin collaboration with Cooperative Lakes Monitoring Program (CLMP)
 - 200+ Michigan lakes
 - Training for volunteers to monitor lakes
 - Testing supplies
 - Published results

<http://www.micorps.net/lakeoverview.html>

Water Quality Monitoring 2016

- ◆ CLMP Year 1 (2016) includes:
 - Secchi Disk Transparency (9+ times / summer)
 - Spring Phosphorus
 - Summer Phosphorus
- ◆ CLMP Year 2 (2017) inc Year 1 plus optional:
 - Chlorophyll
 - Dissolved Oxygen and Temperature
 - Exotic Plant Watch
 - Aquatic Plant Mapping
 - Shoreline Habitat Assessment

Water Quality Monitoring 2016

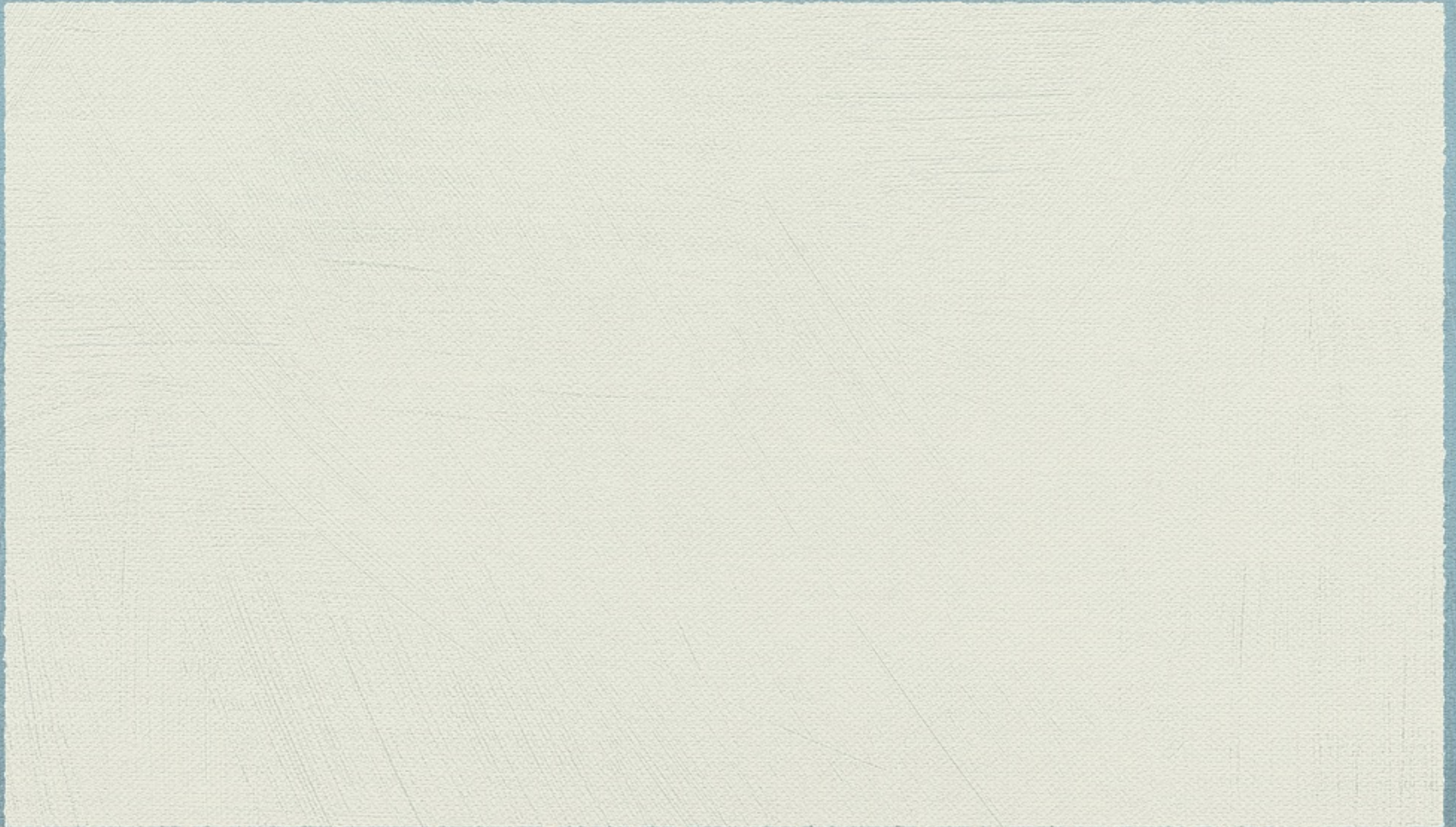
- ◆ We have one volunteer (Tom Slocum)
- ◆ We would like additional volunteers
- ◆ Training for Year 1 is online videos
- ◆ Training for Year 2 is a 1-day conference in April/
May
- ◆ Contact Sam Martin if interested

http://minerlake.com/?page_id=104

VP Position

- ◆ Position was vacated (Terry Skoglund)
- ◆ Terry and Donna sold property
- ◆ Term set to expire Fall 2016
- ◆ Board recommends interim VP Tom Slocum

Member Topics and Q/A



Thank You for Attending

Happy Memorial Day!