LAKE AUMAN WATER CHEMISTRY

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Ortho-P (as PO4) mg/L	Turbid NTU	TSS	Cond. umhos /cm	Alk. mg/L	pH
Detection Levels		**0.02**	**0.01**	**0.01**	**0.02**	**1**	**4**	**10**	**1**	**1-14**
Safe Levels		**<1.5**	**<10**	**<0.05**		**<50**	**n/a**	**n/a**	**n/a**	**6-9**
5/09/95	1	0.01		0.03		1.3		20		7.4
6/14/95	1	0.09		0.01		1.0		28		5.9
7/11/95	1	0.07		0.02		1.0		21		6.7
8/29/95	1	0.03		<0.01		1.3		25		6.0
7/17/01	1	0.05	<0.01	<0.01	<0.02	1.3	<4	24.2	8.4	6.9
7/17/01	2	0.07	0.1	<0.01	<0.02					
7/17/01	3	0.17	0.1	<0.01	<0.02					
7/17/01	4	0.14	0.2	<0.01	<0.02					
7/17/01	5	0.10	0.1	<0.01	<0.02					
8/21/01	1	0.04	<0.01	<0.01	<0.02	2.1	<4	23.2	4.6	7.0
8/21/01	2	0.06	<0.01	0.02	<0.02					
8/21/01	3	0.20	0.2	0.01	<0.02					
8/21/01	4	0.11	0.1	0.01	<0.02					
8/21/01	5	0.09	0.1	<0.01	<0.02					
10/01/01	1	0.06	0.1	0.02	<0.02	1.8	*<4*	23.2	7.0	6.7
10/01/01	2	0.08	0.1	<0.01	<0.02					
10/01/01	3	0.08	0.1	0.01	<0.02					
10/01/01	4	0.07	0.1	0.01	<0.02					
10/01/01	5	0.09	0.1	<0.01	<0.02					
11/05/01	1	0.07	<0.1	<0.01	<0.02	1.9	<4	24.4	8.0	6.5
11/05/01	2	0.08	<0.1	<0.01	<0.02					
11/05/01	3	0.13	0.1	<0.01	<0.02					
11/05/01	4	0.09	0.1	<0.01	<0.02					
11/05/01	5	0.08	0.1	<0.01	<0.02					
12/03/01	1	0.09	<0.1	0.02	<0.02	2.6	<4	26.3	8.0	6.7
12/03/01	2	0.08	0.1	0.01	<0.02					
12/03/01	3	0.11	<0.1	<0.01	<0.02					
12/03/01	4	0.12	0.1	<0.01	<0.02					
12/03/01	5	0.09	<0.1	0.01	<0.02					
01/06/02	1	0.23	0.1	<0.01	<0.02	2.6	<4	25.5	9.2	6.4
01/06/02	2	0.23	0.1	<0.01	<0.02					
01/06/02	3	0.36	0.1	0.03	0.08					
01/06/02	4	0.23	0.1	0.01	0.04					
01/06/02	5	0.23	0.2	0.01	0.04					
02/03/02	1	0.13	0.1	<0.01	<0.02	5.1	<4	25.2	7.6	6.6
02/03/02	2	0.12	0.1	0.01	<0.02					
02/03/02	3	0.18	0.2	0.02	<0.02					
02/03/02	4	0.12	0.1	0.02	<0.02					
02/03/02	5	0.12	0.1	0.02	<0.02					
03/18/02	1	0.09	0.1	<0.01	<0.02	1.2	0.8	24.5	6.4	6.7
03/18/02	2	0.10	0.1	<0.01	<0.02					
03/18/02	3	0.10	0.1	<0.01	0.02					
03/18/02	4	0.11	0.1	0.01	0.04					
03/18/02	5		0.2	0.02	0.05					

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Total P (PO4) mg/L			Ortho-P (as PO4) mg/L	Turbid NTU	TSS	Cond umhs/cm
04/22/02	1	0.05	0.1	<0.01	<0.02			<0.02	1.4	<4	24
04/22/02	2	0.05	0.1	<0.01	<0.02			<0.02			
04/22/02	3	0.11	0.1	<0.01	<0.02			<0.02			
04/22/02	4	0.12	0.2	<0.01	<0.02			<0.02			
04/22/02	5	0.08	0.1	<0.01	0.02			0.02			
05/20/02	1	<0.02	0.1	0.03	0.08			<0.02	1.5	<4	26
05/20/02	2	0.02	0.1	0.03	0.08			<0.02			
05/20/02	3	0.09	0.2	0.03	0.08			<0.02			
05/20/02	4	0.09	0.1	0.01	0.04			<0.02			
05/20/02	5	0.05	0.1	0.02	0.05			<0.02			
06/24/02	1	0.06	0.1	0.04	0.11			<0.02	4.3	<4	25
06/24/02	2	0.07	0.1	0.04	0.11			<0.02			
06/24/02	3	0.15	0.2	0.04	0.13			<0.02			
06/24/02	4	0.12	0.1	0.05	0.14			<0.02			
06/24/02	5	0.12	0.1	0.05	0.15			<0.02			
07/22/02	1	0.06	0.1	0.01	0.03			<0.02	1.9	<4	29
07/22/02	2	0.05	0.1	0.01	0.04			<0.02			
07/22/02	3	0.05	0.1	0.01	0.04			<0.02			
07/22/02	4	0.06	0.1	0.01	0.03			<0.02			
07/22/02	5	0.05	0.1	0.01	0.03			<0.02			
10/28/02	1	0.08	0.1	0.05	0.16			<0.02	n/a	n/a	n/
10/28/02	2	0.10	0.1	<0.01	<0.02			<0.02			
10/28/02	3	0.09	0.2	<0.01	<0.02			<0.02			
10/28/02	4	0.19	0.3	<0.01	<0.02			<0.02			
10/28/02	5	0.09	0.2	0.02	0.06			<0.02			
01/27/03	1	0.18	0.2	0.02	<0.01			<0.02			
01/27/03	2*	0.41	1.3	0.07	<0.01			<0.02			
01/27/03	3*	0.26	1.2	0.02	<0.01			<0.02			
01/27/03	6*	0.09	1.4	0.04	<0.01			<0.02			
01/27/03	5*	0.14	0.6	0.05	<0.01			<0.02			
04/28/03	1	0.04	0.1	0.02	0.06			<0.02			
04/28/03	2	0.05	0.2	0.01	0.04			<0.02			
04/28/03	3	0.08	0.1	0.01	0.04			<0.02			
04/28/03	4	0.16	0.2	0.02	0.07			<0.02			
04/28/03	5	0.17	0.2	0.02	0.05			<0.02			

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Ortho-P (as PO4) mg/L			P04	TSS	Cond. umhos/ cm	Alk. mg/L
07/14/03	1	0.04	<0.1	0.01	<0.02						
	2	0.09	0.1	0.01	<0.02						
	3	0.10	0.1	0.01	<0.02						
	4	0.08	0.1	0.04	<0.02						
	5	0.14	0.1	0.02	<0.02						
10/07/03	1	0.05	<0.1	0.01	<0.02						
	2	0.05	0.2	0.01	<0.02						
	3	0.05	0.2	<0.01	<0.02						
	4	0.05	0.2	<0.01	<0.02						
	5	0.05	0.2	0.01	<0.02						
02/02/04	1	0.17	0.2	<0.01	<0.02						
	2	0.15	0.3	0.06	<0.02						
	3	0.18	0.7	0.02	<0.02						
	4	0.10	0.4	0.03	<0.02						
	5	0.13	0.4	<0.01	<0.02						
04/28/04	1	<0.02	0.2	0.01	<0.02						
	2	0.03	0.2	0.01	<0.02						
	3	0.06	0.4	<0.01	<0.02						
	4	0.12	0.3	<0.01	<0.02						
	5	0.06	0.2	0.02	<0.02						
08/03/04	1	<0.02	<0.1	<0.01	<0.02			<0.01			
	2	<0.02	0.1	<0.01	<0.02			<0.01			
	3	<0.02	0.1	<0.01	<0.02			<0.01			
	4	0.06	0.1	0.02	<0.02			<0.01			
	5	0.10	0.1	0.01	<0.02			<0.01			
10/31/04	1	0.06	<0.1	0.01	<0.02			<0.01			
	2	0.06	<0.1	0.02	<0.02			<0.01			
	3	0.08	<0.1	0.03	<0.02			<0.01			
	4	0.15	0.1	0.02	<0.02			<0.01			
	5	0.07	<0.1	0.03	<0.02			<0.01			
2/2/05	1	0.15	0.1	<0.01	<0.02			<0.01			
	2	0.16	0.1	<0.01	<0.02			<0.01			
	3	0.17	0.2	<0.01	<0.02			<0.01			
	4	0.21	0.1	<0.01	<0.02			<0.01			
	5	0.13	0.3	<0.01	<0.02			<0.01			

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Total P (PO4) mg/L	PO4 mg/L (PO4)	PO4 mg/L P	Turbid NTU	TSS	Cond. umhos/cm	Alk. mg/L	pH
Reporting Limits		**0.02**	**0.1**	**0.01**	**0.02**	**0.02**	**0.01**					
5-2-05	1	0.07	0.1	0.01	0.03							
	2	0.06	0.2	0.03	0.09							
	3	0.07	0.3	0.03	0.09							
	4	0.14	0.2	0.03	0.08							
	5	0.07	0.1	0.02	0.05							
8-2-05	1	0.05	<0.1	0.02	0.06	<0.02	<0.01					
	2	0.07	0.2	0.01	0.02	<0.02	<0.01					
	3	0.06	0.1	0.01	0.02	<0.02	<0.01					
	4	0.16	0.2	0.02	0.06	<0.02	<0.01					
	5	0.12	0.1	0.02	0.07	<0.02	<0.01					
12-12-05#	1	0.21	0.1	0.21	0.21	0.14	0.05					
	2	0.15	0.1	0.05	0.05	<0.02	<0.01					
	3	0.18	0.1	<0.01	<0.02	<0.02	<0.01					
	4	0.17	0.1	<0.01	<0.02	<0.02	<0.01					
	5	0.17	0.1	<0.01	<0.02	<0.02	<0.01					
4-11-06	1	0.07	0.1	0.12	0.05	<0.02	<0.01					
	2	0.09	0.2	0.01	0.03	<0.02	<0.01					
	3	0.10	0.3	0.03	0.09	<0.02	<0.01					
	4	0.14	0.2	0.02	0.06	<0.02	<0.01					
	5@	0.25	0.3	0.02	0.06	<0.02	<0.01					
9-6-06	1	0.04	<0.1	<0.01	<0.02	<0.02	<0.01					
	2	0.07	<0.1	0.02	0.05	<0.02	<0.01					
	3	0.07	0.1	<0.01	<0.02	<0.02	<0.01					
	4	0.12	0.1	0.01	0.04	<0.02	<0.01					
	5	0.10	0.1	0.01	0.04	<0.02	<0.01					
12-11-06	1	0.19	0.2	0.01	0.04	<0.02	<0.01					
	2	0.18	0.2	0.02	0.06	<0.02	<0.01					
	3	0.19	0.2	0.01	0.03	<0.02	<0.01					
	4	0.19	0.1	0.02	0.06	<0.02	<0.01					
	5	0.19	0.2	0.01	0.03	<0.02	<0.01					
3-26-07	1	0.12	0.2	0.01	0.02	<0.02	<0.01					
	2	0.11	0.2	<0.01	<0.02	<0.02	<0.01					
	3	0.11	0.2	<0.01	<0.02	<0.02	<0.01					
	4	0.12	0.3	0.01	0.03	<0.02	<0.01					
	5	0.15	0.3	0.01	0.02	<0.02	<0.01					
7-10-07	1	0.04	<0.1	<0.01	0.01	0.01	<0.01					
	2	0.04	0.1	0.01	0.02	0.02	0.01					
	3	0.06	0.1	<0.01	<0.02	0.01	<0.01					
	4	0.05	0.1	0.01	0.02	<0.02	<0.01					
	5	0.06	0.1	0.01	0.02	0.01	<0.01					
10-16-07	1	0.05	0.1	<0.01	<0.01	<0.01	<0.01					
	2	0.05	0.0	<0.01	<0.01	<0.01	<0.01					
	3	0.04	0.0	<0.01	<0.01	<0.01	<0.01					
	4	0.03	0.0	0.02	0.01	0.01	<0.01					
	5	0.05	0.1	0.04	0.01	0.01	<0.01					

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Total P g/mL (P04)	PO4 mg/L (PO4)	PO4 mg/L P					
Reporting Limits		**0.02**	**0.1**	**0.01**	**0.02**	**0.02**	**0.01**					
1/14/08	1	0.22	0.1	<0.01	0.01	0.01	<0.01					
	2	0.20	0.2	0.01	0.02	0.02	0.01					
	3	0.20	<0.1	<0.01	0.01	0.01	<0.01					
	4	0.15	0.2	0.01	0.03	0.01	<0.01					
	5	0.20	0.3	0.01	0.02	0.01	<0.01					
4/22/08	1	0.08	0.2	0.03	0.10	0.02	0.01					
	2	0.06	0.2	0.02	0.07	0.06	0.02					
	3	0.08	0.3	<0.01	0.01	0.02	0.01					
	4	0.10	0.2	<0.01	0.01	0.03	0.01					
	5	0.09	0.3	0.01	0.03	0.04	0.01					
8/05/08	1	0.10	<0.1	0.01	0.04	0.03	0.01					
	2	0.08	0.2	0.01	0.03	0.03	0.01					
	3	0.09	0.1	0.01	0.04	0.05	0.02					
	4	0.19	0.2	0.02	0.05	0.03	0.01					
	5	0.16	0.1	0.02	0.05	0.04	0.01					
11-17-08	1	0.12	0.1	<0.01	0.01	0.05	0.02					
	2	0.13	<0.1	<0.01	0.01	0.06	0.02					
	3	0.11	0.2	0.10	0.04	0.04	0.01					
	4	0.12	0.2	0.02	0.07	0.07	0.02					
	5	0.14	0.2	0.01	0.03	0.05	0.02					
2-10-09	1	0.18	<0.1	<0.01	0.01	0.02	0.01					
	2	0.17	<0.1	0.02	0.07	0.02	0.01					
	3	0.20	<0.1	<0.01	0.01	0.03	0.01					
	4	0.20	<0.1	<0.01	0.01	0.01	<0.01					
	5	0.23	0.1	0.02	0.05	0.02	0.01					

Date	Site	NH3 mg/L	Nitrate/ Nitrite-N mg/L	Total P (as P) mg/L	Total P g/mL (P04)	PO4 mg/L (PO4)	PO4 mg/L P			
Reporting Limits		**0.02**	**0.1**	**0.01**	**0.02**	**0.02**	**0.01**			
8-4-09	1	0.05	0.1	0.01	0.02	0.01	<0.01			
	2	0.06	0.1	0.02	0.06	0.01	<0.01			
	3	0.05	0.1	0.02	0.07	0.01	<0.01			
	4	0.06	0.1	0.02	0.05	0.02	0.01			
	5	0.07	0.1	0.01	0.04	0.02	0.01			
	Bottom	0.59	0.1	0.02	0.06	0.01	<0.01			

Site Locations:1 = Lake outflow at dam

2 = In lake, adjacent to lot #3392 * = Stream flowing into lake
3 = In Lake, adjacent to lot #3208 *6= Stream at lot 3363
4 = In Lake, adjacent to lot #3180 # Samples taken during lake mixing
5 = In Lake, adjacent to lot #3083 @ Bulkhead under construction in cove

Units: Milligrams per liter (mg/L) is equivalent to parts per million (ppm).

The following explanations are taken mostly from Technical Report #00-075 of the Environmental Quality Institute of the U. of N.C. at Asheville. The 2001& 2002 water samples shown above were analyzed by that Institute under a grant funded in part by the Institute and in part by the Seven Lakes West Side Land Owners Association.

NH3 = Nitrogen is contained in the remains of decaying wastes of plants and animals. Ammonia (NH3) is produced by bacteria and fungi, which break down organic matter. Elevated levels of NH3 can be toxic to fish. The standard to protect trout (which tend to be more sensitive) ranges from 1 ppm in summer to 2 ppm in winter. Most sources of ammonia nitrogen in our watershed are from lawn and garden runoff and septic systems.

Nitrate/Nitrite Like phosphorous, nitrate/nitrite serve as essential nutrients for plant growth and come from lawn and garden runoff and septic systems. High nitrate levels are toxic to infants and damaging to aquatic ecosystems. The standard to protect drinking water and aquatic ecosystems is 10 ppm.

Orthophosphate (as PO4) is sometimes referred to as "reactive phosphorus." Orthophosphate is the most stable kind of phosphate, and is the form used by plants. Phosphorus is an essential nutrient for plant growth. It is usually the limiting nutrient in most aquatic systems. Excessive phosphorus inputs stimulate the growth of plankton and weeds. Plankton impart the greenish color to the water. Increases in phosphorous will cause increased plankton and reduce the clarity of water and stimulate weed growth in coves. Excessive phosphorous (e.g. >0.05 ppm) will cause unsightly and smelly algal scums on water. This is a delicate balance. Nutrients are needed to support a food chain necessary for fish to thrive, but too much nutrient will cause the water to look like pea soup and smell worse. Phosphates (as well as nitrogen compounds) come from fertilizers carried into the lake by groundwater and septic systems (more so if they malfunction).

Total P (as P) is a way to isolate phosphorous content by taking the orthophosphate and dividing by 3.

Turbidity is a measure of the visual clarity of water and indicates the presence of fine suspended particulate matter. The unit of measurement is NTU (nephelometric turbidity units), which measures the absorption and reflection of light when it is passed though a water sample. Fish eggs can withstand only limited amounts of silt before hatching. The danger limit for trout is 10 NTU while the standard to protect other aquatic life is 50 NTU.

Total Suspended Solids (TSS) quantifies suspended solids in water by weight and is heavily influenced by land disturbing activities.

Conductivity is measured in micromhos per centimter (umho/cm) and is a measure of the abiity of water to conduct an electrical current. Absolutely pure water will not conduct an electrical current. Dissolved salts or solids in water cause it to be conductive. There is no legal standard for conductivity, but potable water usually has a range from 50-1500, while industrial wastewater may have levels above 10,000.

Alkalinity is a measure of the acid neutralizing capacity of water. Waters with high alkalinity are considered to be protected (well buffered) against acidic inputs. There are no legal standards for alkalinity, but waters with alkalinity below 30 ppm are considered to have low alkalinity. Alkalinity in waters of the Sandhills is naturally low because of the absence of limestone in our watershed. Low alkalinity may be considered somewhat of a deficiency in protecting the pH of the lake, but high alkalinity would give us “hard water”.

pH is a measure of acidity. A value of 7 is neutral. Values lower than 7 are acid; higher than 7 are basic. Values below 6.5 may indicate the effects of acid rain or other acidic inputs; and values above 7.5 may be indicative of industrial discharge. Values between 6 and 9 are suitable for aquatic wildlife.