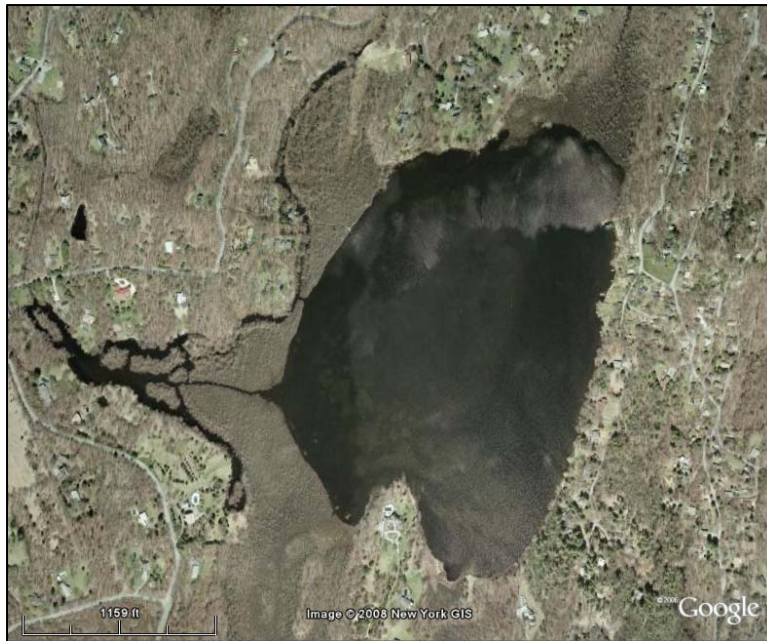


**Lake Kitchawan**

Surface water quality classification: Class B

Morphology Summary:

<b>Characteristic</b>	<b>Units</b>	<b>Value</b>	<b>Source</b>
Surface area	hectares	43	ENSR 2008
Watershed area	hectares	225	EcoLogic 2008 (excl lake)
		184.6 (lake)	ENSR 2008
		141.9 (lagoon)	
		326.4 (both)	
Volume	mgal	174 (lake)	ENSR 2008
		3 (lagoon)	
		177 (both)	
Elevation	m	158	
Maximum depth	m	4.3	ENSR 2008
Average Depth	m	1.7	ENSR 2008

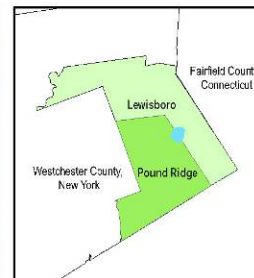
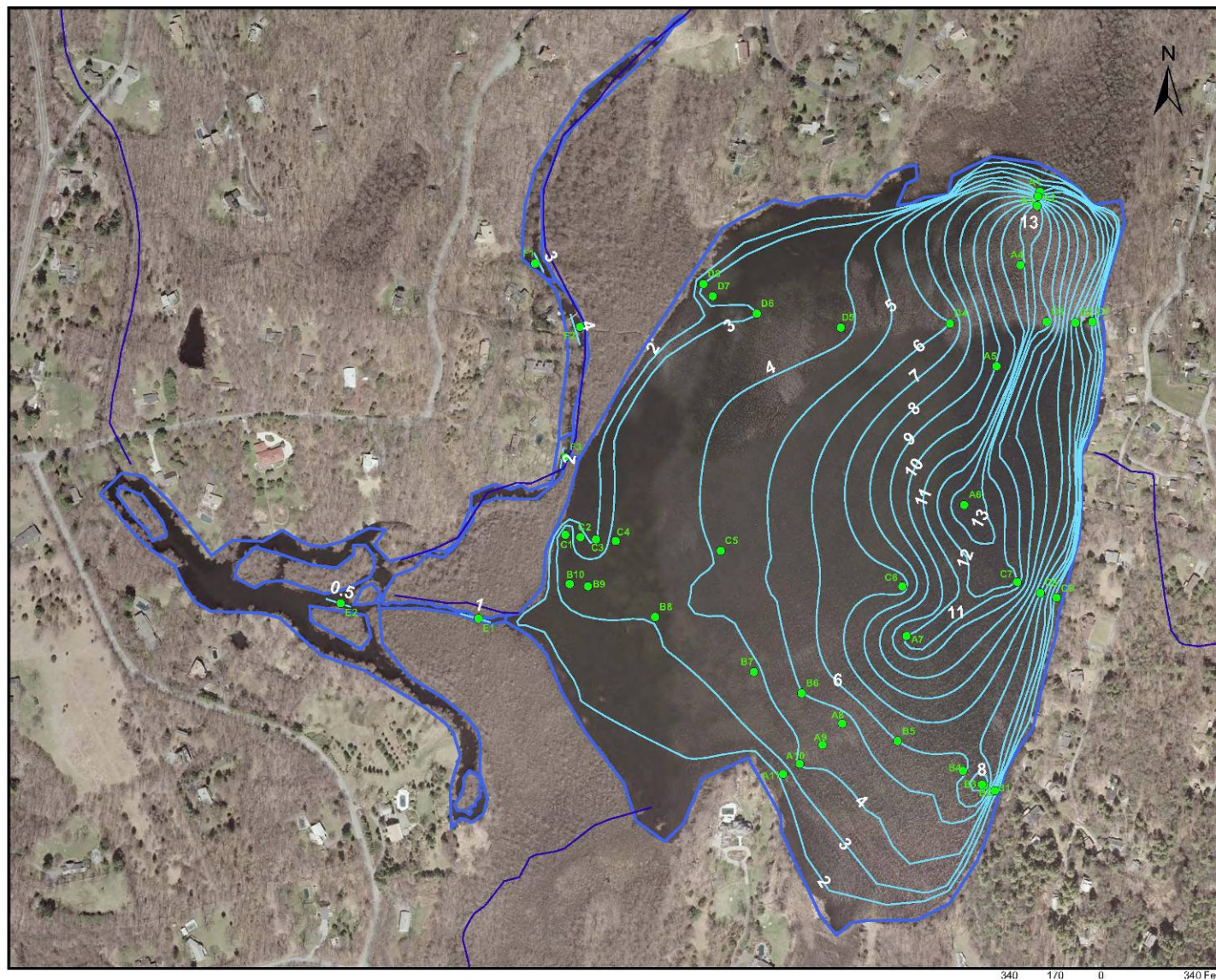
Lake Inlet: Primary inlet drains a large area to the north and enters at north end. Secondary inlets drain areas west and south of the lake. Numerous storm drains enter along east shore.

Lake Outlet: The Lake discharges to the west.

Recreational impacts: Occasional poor water quality. High density of macrophytes.

Lakeshore Development: Development is predominantly residential; the highest density is to the east of the lake.

# Figure 1 Lake Kitchawan Bathymetry



- Legend**
- Water Depth Contour
  - Streams
  - Kitchawan Lake and Lagoon

NO.	DATE	BY	REVISION

ENSR | AECOM

ENSR CORPORATION  
 1000 WEST 10TH AVENUE  
 SUITE 1000  
 DENVER, CO 80202  
 TEL: 303.733.4000  
 FAX: 303.733.4001  
 WWW.ENSRCORP.COM

**Water Depth Contour Map**  
 Kitchawan Lake Management Plan - New York

PROJECT NUMBER: 0112574081  
 DATE: 12/20/2007  
 SCALE: As Shown

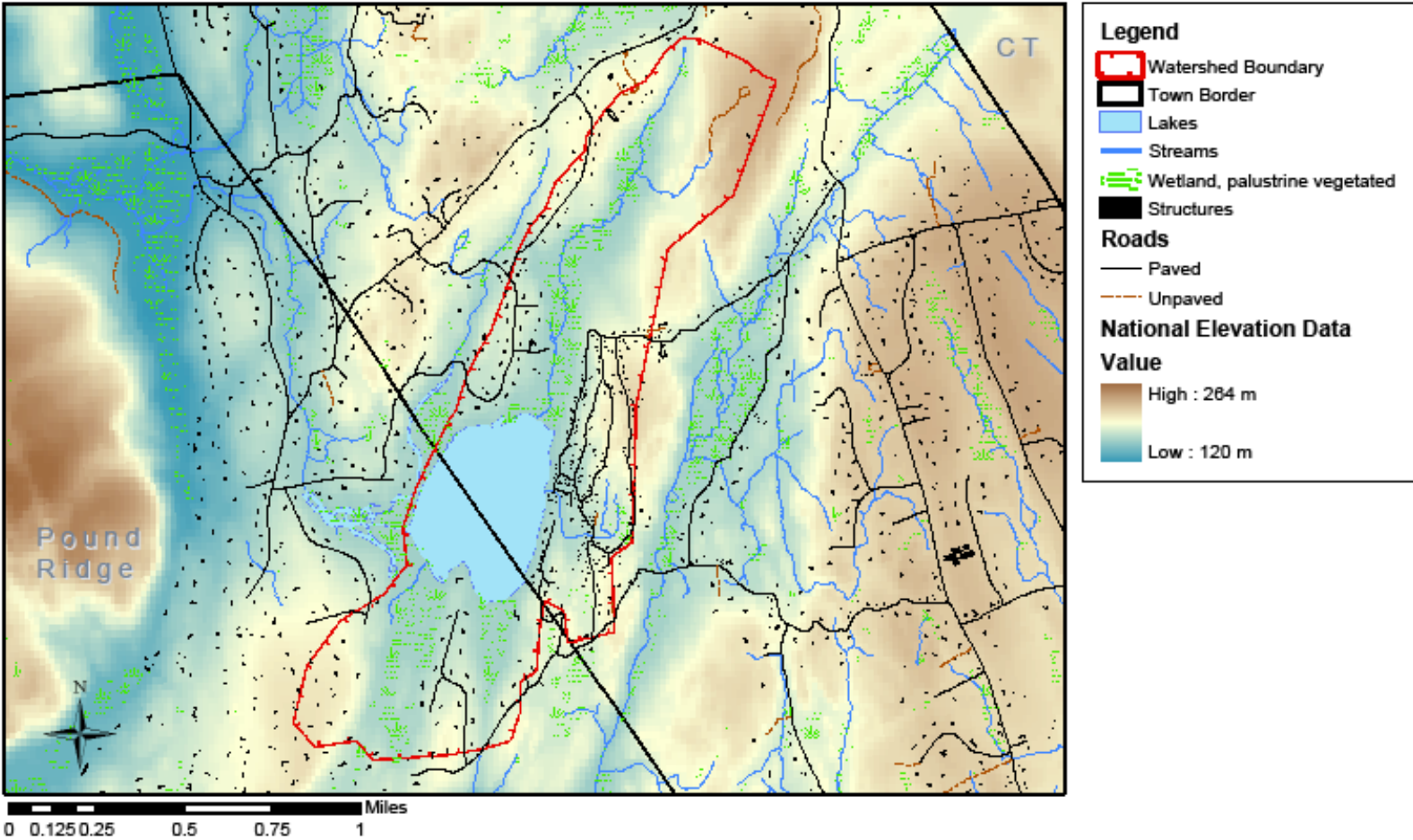
PROJECT NUMBER: 0112574081  
 DATE: 12/20/2007  
 SCALE: As Shown

- Notes:
1. Projection: New York State Plane, East FIPS 3101, NAD 83 (in feet).
  2. Sources: ENSR Bathymetry Survey 2007.

**5**

Sheet Number

**Figure 2**  
**Lake Kitchawan**  
**Topographic and Human Features**



**Sources:**  
 Lakes, Streams, Wetlands, Roads and Structures - On-line at Westchester County web site <http://giswww.westchestergov.com/>. Municipal planimetric datasets were photogrammetrically derived from the county's 2004 base map project and meet National Map Accuracy Standards at 1"=100'.  
 National Elevation Dataset - U.S. Geological Survey (USGS), EROS Data Center, 1999. On-line at <http://niedata.usgs.net/nied/>.  
 Geographic coordinate system. Horizontal datum of NAD83. Vertical datum of NAVD86.



Historical water quality data summary: ENSR(2007) reported two sample events, May and July; Samples were collected from five sites: three in the lake; one at the outlet; and one in the wetland. Only one of the five sites – Site 2 – was sampled both at the surface and at depth.

<b><u>A. Representing in-lake samples collected in May and July 2007.</u></b>						
<b>Parameter (units)</b>	<b>Time Period</b>	<b>Location</b>	<b>Number of Samples</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
Alkalinity (mg/l)	2007	Upper waters	6	58.9	160	77.5
		Lower waters	2	64.9	85.9	75.4
Chlorophyll- $\alpha$ (ug/l)	2007	Upper waters	2	0.65	5.8	3.2
		Lower waters	0	--	--	--
Conductivity (uS/cm)	2007	Upper waters	9	248	282	263
		Lower waters	5	257	321	275
Dissolved oxygen (mg/l)	2007	Upper waters	9	5.66	11.7	8.95
		Lower waters	5	0.26	16.4	9.94
Dissolved oxygen (%)	2007	Upper waters	9	68	138	106
		Lower waters	5	3.1	183	108
Fecal Coliform (col/100ml)	2007	Upper waters	6	4	46	16.7
		Lower waters	0	--	--	--
pH (std units)	2007	Upper waters	9	7.82	9.06	8.48
		Lower waters	5	6.98	8.84	8.17
Temperature (°C)	2007	Upper waters	9	22.8	25.3	23.8
		Lower waters	5	17.9	21.8	19.9
Total suspended solids (mg/l)	2007	Upper waters	5	<3.9	5.0	4.2
		Lower waters	2	<3.9	6.0	5.0
<b><u>Nutrients:</u></b>						
Total Phosphorus (mg/l)	2007	Upper waters	6	0.015	0.085	0.037
		Lower waters	2	0.011	0.023	0.017
Soluble Reactive P (mg/l)	2007	Upper waters	6	<0.005	0.03	0.017
		Lower waters	2	0.009	0.02	0.015
Ammonia Nitrogen (mg/l)	2007	Upper waters	6	<0.032	0.1	0.058
		Lower waters	2	<0.032	0.13	0.081
Nitrate plus Nitrite (mg/l)	2007	Upper waters	6	<0.007	0.062	0.023
		Lower waters	2	<0.007	0.008	0.0075
Total Kjeldahl Nitrogen (mg/l)	2007	Upper waters	6	0.38	0.72	0.58
		Lower waters	2	0.27	0.81	0.54
Note: Site 2 surface duplicate averaged with parent sample prior to calculating upper waters average. Upper waters statistics represent samples collected at depths of less than 2m from three sites in the lake. Lower waters statistics represent samples collected at depths greater than 2m from Site 2 in the lake.						

<b><u>B. Representing in-lake samples collected in July 2007.</u></b>						
<b>Parameter (units)</b>	<b>Time Period</b>	<b>Location</b>	<b>Number of Samples</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
Chlorophyll- $\alpha$ (ug/l)	2007	Upper waters	1	5.75	5.75	5.75
		Lower waters	0	--	--	--

<b><u>B. Representing in-lake samples collected in July 2007.</u></b>						
<b>Parameter (units)</b>	<b>Time Period</b>	<b>Location</b>	<b>Number of Samples</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
Dissolved oxygen (mg/l)	2007	Upper waters	4	6.95	8.48	7.44
		Lower waters	3	14.89	16.36	15.46
Dissolved oxygen (%)	2007	Upper waters	4	81	100.4	87.95
		Lower waters	2	3.1	35.2	19.2
<b><u>Nutrients:</u></b>						
Total Phosphorus (mg/l)	2007	Upper waters	3	0.015	0.031	0.025
		Lower waters	1	0.023	0.023	0.023
Soluble Reactive P (mg/l)	2007	Upper waters	3	<0.005	0.03	0.015
		Lower waters	1	0.021	0.021	0.021
Ammonia Nitrogen (mg/l)	2007	Upper waters	3	0.066	0.1	0.084
		Lower waters	1	0.13	0.13	0.13
Nitrate plus Nitrite (mg/l)	2007	Upper waters	3	0.026	0.062	0.039
		Lower waters	1	0.008	0.008	0.008
Total Kjeldahl Nitrogen (mg/l)	2007	Upper waters	3	0.66	0.72	0.69
		Lower waters	1	0.81	0.81	0.81
<p>Note: Site 2 surface duplicate averaged with parent sample prior to calculating upper waters average. Upper waters statistics represent samples collected at depths of less than 2m from three sites in the lake. Lower waters statistics represent samples collected at depths greater than 2m from Site 2 in the lake.</p>						

August 2008 water quality data summary:

**A. Analytical Results**

<b>Parameter (units)</b>	<b>Surface (0 m)</b>	<b>Depth (4.6 m)</b>
Secchi Transparency (m)	1.50	na
Chlorophyll-a (mg/l)	0.014	na
Alkalinity (mg/l)	54	na
<b><u>Phosphorus:</u></b>		
Total Phosphorus (mg/l)	0.013	0.035
Soluble Reactive Phosphorus (mg/l)	0.0087 <sup>a</sup>	0.014 <sup>a</sup>
<b><u>Nitrogen:</u></b>		
Total Nitrogen	1	1.5
Nitrate + Nitrite N (mg/l)	0.049 <sup>a</sup>	0.17 <sup>a</sup>
Total Kjeldahl Nitrogen (mg/l)	0.98 <sup>a</sup>	1.3 <sup>a</sup>
na – not analyzed		
<sup>a</sup> The result of the laboratory control sample was greater than the established limit.		

**B. Field Profiles**

Depth ft (m)	Temperature (°C)	pH	Conductivity (us)	DO (mg/l)	DO (% sat)
1 (0.305)	23.4	6.8	319	5.0	59.5
2 (0.610)	23.8		321	5.0	59.5
3 (0.915)	23.8		321	5.0	59.5
4 (1.22)	23.8		321	5.0	59.8
5 (1.53)	23.8		319	5.0	59.8
6 (1.83)	23.8		321	5.0	59.8
7 (2.14)	23.8		320	5.0	58.9
8 (2.44)	23.8		319	5.1	60.6
9 (2.75)	23.8		319	5.2	61.4
10 (3.05)	23.7		312	5.5	62.6
11 (3.36)	23.2		312	5.5	62.8
12 (3.66)	22.9		295	4.6	54.3
13 (3.97)	22.8		297	4.7	55.4
14 (4.27)	22.4		287	4.6	53.1
14.5 (4.42)	22.4		287	4.6	53.1

Sediment data summary:

- Composite samples collected August 12, 2008 (EcoLogic, 2008):

Parameter	Analytical Method	Result (mg/kg dry wt)
Pesticides/PCBs	EPA 8081/8082	ND
TCL Volatiles	EPA 8260B	ND
TCL Semi-Volatiles	EPA 8270	ND
<u>RCRA Total Metals</u>	EPA 6010	
Arsenic		ND
Barium		16
Cadmium		0.24
Chromium		3.1
Copper		8.5
Lead		11
Selenium		0.054
Silver		ND
RCRA Mercury	EPA 7471	ND
Total Organic Carbon	EPA 9060	94000
Total Solids	SM 18-20 2540B	12%
ND – non-detect. Analytes reported as less than the method detection limit.		

Sediment Contaminant Analysis: Interest has been expressed in exploring the feasibility of dredging. A composite sediment sample was collected on August 13, 2008 (EcoLogic, 2008) to determine if any threshold screening values that might preclude dredging were exceeded. Results are summarized in Table C, in the context of NYSDEC Screening levels. A complete set of results is attached to the end of this report. (Attachment 2 - 2008 Water Quality and Sediment Sampling Locations and Laboratory Analysis Reports). The NYSDEC screening levels are separated into three Classes: A, B, and C:

- **Class A - No Appreciable Contamination (No Toxicity to aquatic life).**  
If sediment chemistry is found to be at or below the chemical concentrations which define this class, dredging and in-water or riparian placement, at approved locations, can generally proceed.
- **Class B - Moderate Contamination (Chronic Toxicity to aquatic life).**  
Dredging and riparian placement may be conducted with several restrictions. These restrictions may be applied based upon site-specific concerns and knowledge coupled with sediment evaluation.
- **Class C - High Contamination (Acute Toxicity to aquatic life).**  
Class C dredged material is expected to be acutely toxic to aquatic biota and therefore, dredging and disposal requirements may be stringent. When the contaminant levels exceed Class C, it is the responsibility of the applicant to ensure that the dredged material is not a regulated hazardous material as defined in 6NYCRR Part 371. This TOGS does not apply to dredged materials determined to be hazardous.

**Table C.** Lake Kitchawan sediment analytical results, with NYSDEC Sediment Quality Threshold Values for Dredging, Riparian or In-water Placement. Threshold values are based on known and presumed impacts on aquatic organisms/ecosystem. Results that fall into Class C (high contamination) are highlighted. ND= Not detected.

Compound	Required Method Detection Limit	Threshold Values			Kitchawan Results	Threshold Class
		Class A	Class B	Class C		
<b>Metals (mg/kg dry wt) – EPA Method 6010B</b>						
Arsenic	1.0	< 14	14 – 53	> 53	ND	A
Cadmium	0.5	< 1.2	1.2 - 9.5	> 9.5	0.24	A
Copper*	2.5	< 33	33 – 207	> 207	8.5	A
Lead	5.0	< 33	33 – 166	> 166	11	A
Mercury <sup>+</sup>	0.2	< 0.17	0.17 - 1.6	> 1.6	ND	A
<b>PAHs and Petroleum-Related Compounds (mg/kg dry wt) – EPA Methods 8020, 8021, 8260 and 8270</b>						
Benzene	0.002	< 0.59	0.59 - 2.16	> 2.16	ND	A
Total BTEX*	0.002	< 0.96	0.96 - 5.9	> 5.9	ND	A
Total PAH <sup>1</sup>	0.33	< 4	4 - 35	> 35	ND	A
<b>Pesticides (mg/kg dry wt) – EPA Methods 8081</b>						
Sum of DDT+DDD+DDE <sup>+</sup>	0.029	< 0.003	0.003 - 0.03	> 0.03	ND	A
Mirex* <sup>+</sup>	0.189	< 0.0014	0.0014 - 0.014	> 0.014	na	--
Chlordane* <sup>+</sup>	0.031	< 0.003	0.003 - 0.036	> 0.036	ND	A
Dieldrin	0.019	< 0.11	0.11 - 0.48	> 0.48	ND	A
<b>Chlorinated Hydrocarbons (mg/kg dry wt) – EPA Methods 8082 and 1613B</b>						
PCBs (sum of aroclors) <sup>2</sup>	0.025	< 0.1	0.1 - 1	> 1	ND	A
2,3,7,8-TCDD* <sup>3</sup> (sum of toxic equivalency)	0.000002	< 0.0000045	0.0000045 - 0.00005	> 0.00005	na	--

na – not analyzed. ND – not detected

<sup>+</sup>Threshold values lower than the Method Detection Limit are superseded by the Method Detection Limit.

\* Indicates case-specific parameter. The analysis and evaluation of these case specific analytes is recommended for those waters known or suspected to have sediment contamination caused by those chemicals. These determinations are made at the discretion of Division staff.

<sup>1</sup>For Sum of PAH, see Appendix E of TOGS 5.1.9. For Lake Kitchawan, each of the 18 PAH compounds were reported as non-detect (<0.7 mg/kg).

<sup>2</sup>For the sum of the 22 PCB congeners required by the USACE NYD or EPA Region 2, the sum must be multiplied by two to determine the total PCB concentration. For Lake Kitchawan, seven Aroclors were each reported as <0.2 mg/kg; this value is reported above.

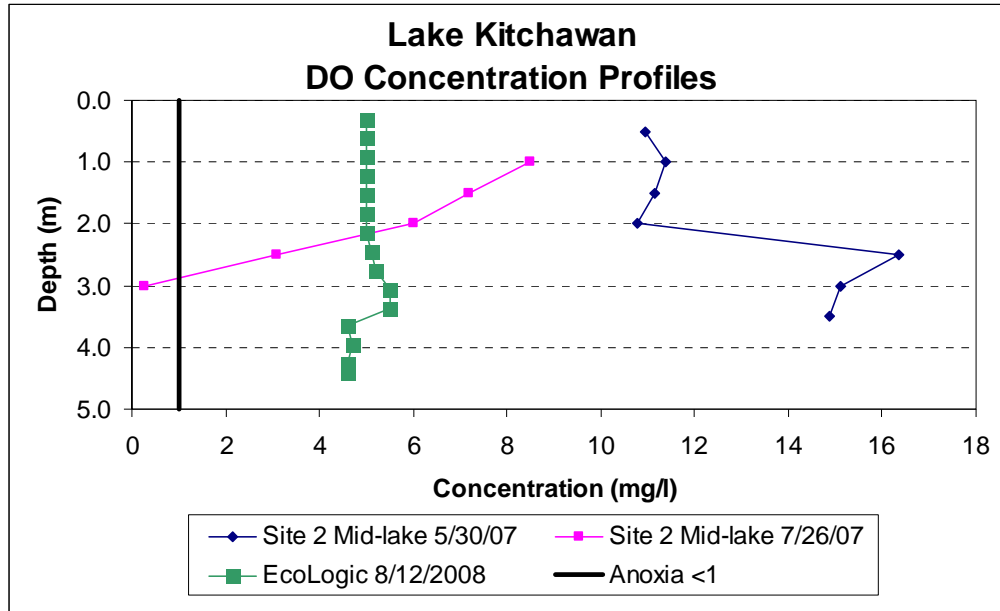
<sup>3</sup>TEQ calculation as per the NATO - 1988 method (see Appendix D of TOGS 5.1.9).

Note: The proposed list of analytes can be augmented with additional site specific parameters of concern. Any additional analytes suggested will require Division approved sediment quality threshold values for the A, B and C classifications.

**Source:** Table 2, NYSDEC Division of Water, Technical & Operational Guidance Series (TOGS) 5.1.9, "In-Water and Riparian Management of Sediment and Dredged Material", Nov. 2004

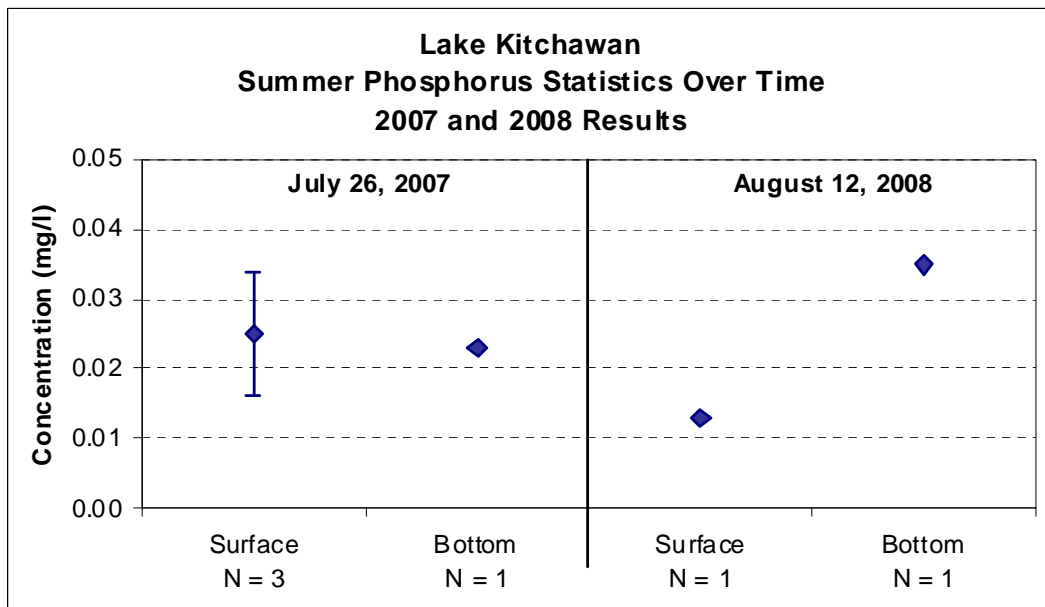


Anoxia: Evidence of anoxic conditions at depth in July 2007; no stratification in May 2007 or in August 2008.

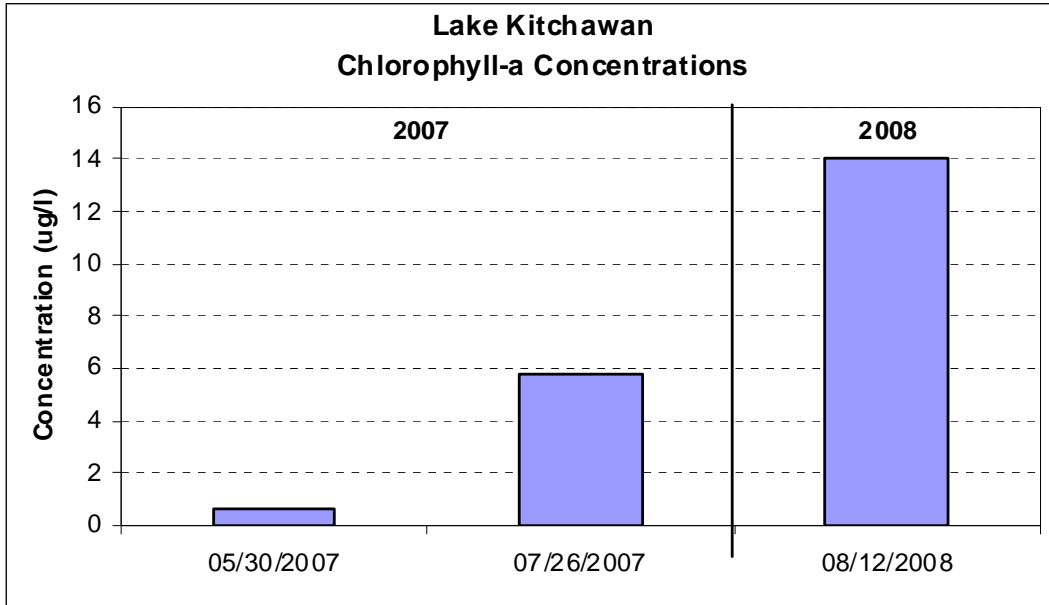


Water Clarity: Secchi depth was measured at 1.5 meters by EcoLogic on August 12, 2008. This is the only known Secchi measurement.

Phosphorus Concentrations: Samples were collected in-lake in May and July 2007, and August 2008.



Chlorophyll-a: Two samples collected in 2007 from the mid-lake sample location, and one sample in 2008.



Trophic Status:

Parameter	Trophic State (shading indicates match to Lake)				Lake Kitchawan*
	Oligotrophic	Mesotrophic	Eutrophic	Hypereutrophic	
Summer average Total Phosphorus, upper waters (µg/l)	<10	10-35	35 -100	>100	23
Summer chlorophyll-a, upper waters (µg/l)	<2.5	2.5 - 8	8 - 25	>25	5.6
Peak chlorophyll-a (µg/l)	<8	8-25	25-75	>75	5.8
Average Secchi disk transparency, m	>6	6-3	3-1.5	<1.5	1.5
Minimum Secchi disk transparency, meters	>3	3-1.5	1.5-0.7	<0.7	1.5
Dissolved oxygen in lower waters (% saturation)	80 - 100	10-80	Less than 10	Zero	19%

ENSR data collected May and July 2007; summer represented by July samples except Secchi depth which represents one reading collected by EcoLogic on 8/12/2008.  
 Sample results from 2007 include three lake stations, and do not include outlet and wetland samples collected during the same field event.

Aquatic Habitat:

- Supports a warm-water fish community (largemouth bass, sunfish, other recreational species)
- Invasives observed: Eurasian watermilfoil

- Aquatic plants identified in July 2007

Scientific Name	Common Name
<i>Ceratophyllum demersum</i>	Coontail
<i>Elodea canadensis</i>	Common Water Weed
<i>Lemna sp.</i>	Duckweed
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Myriophyllum spicatum.</i>	Eurasian Milfoil
<i>Nuphar polysepala</i>	Spatterdock
<i>Nuphar sp.</i>	Yellow Water Lily

Scientific Name	Common Name
<i>Nymphaea sp.</i>	White Water Lily
<i>Pontederia cordata</i>	Pickerel Weed
<i>Potamogeton crispus</i>	Curly Pondweed
<i>Potamogeton illinoensis</i>	Illinois Pondweed
<i>Potamogeton robensii</i>	Fern Pondweed
<i>Ranunculus longirostris</i>	White Water Crowfoot
<i>Vallisneria americana</i>	Wild Celery

Invasive Species: Early Detection List for eight regions in New York State, published by the Invasive Species Plant Council of New York State. Obtained on-line (11/29/07). Lower Hudson region list:

Scientific Name	Common Name
<i>Heracleum mantegazzianum</i>	Giant Hogweed
<i>Wisteria floribunda</i>	Japanese Wisteria, Wisteria
<i>Digitalis grandiflora (D. pupurea)</i>	Yellow Foxglove, Foxglove
<i>Geranium thunbergii</i>	Thunberg's Geranium
<i>Miscanthus sinensis</i>	Chinese Silver Grass, Eulalia
<i>Myriophyllum aquaticum</i>	Parrot-feather, Waterfeather, Brazilian Watermilfoil.
<i>Pinus thunbergiana (P. thunbergii)</i>	Japanese Black Pine
<i>Prunus padus</i>	European Bird Cherry
<i>Veronica beccabunga</i>	European Speedwell

Endangered Species:

- US Fish and Wildlife Service

Scientific Name	Common Name	Federal Status
<b>Reptiles</b>		
<i>Clemmys muhlenbergii</i>	Bog Turtle	Threatened, Westchester Co.
<b>Birds</b>		
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Threatened, entire state
<b>Mammals</b>		
<i>Myotis sodalist</i>	Indiana Bat	Endangered, entire state
<i>Felis concolor cougar</i>	Eastern Cougar	Endangered, entire state (probably extinct)
<b>Plants</b>		
<i>Isotria medeoloides</i>	Small Whorled Pogonia	Threatened, entire state
<i>Platanthera leucophea</i>	Eastern Prairie Orchid	Threatened, not relocated in NY
<i>Scirpus ancistrochaetus</i>	Northeastern Bulrush	Endangered, not relocated in NY

- New York Natural Heritage Program – Town of Lewisboro

<b>Scientific Name</b>	<b>Common Name</b>	<b>NY Legal Status</b>
<b><u>Reptiles</u></b>		
<i>Glyptemys muhlenbergii</i> (formerly <i>Clemmys muhlenbergii</i> )	Bog Turtle	Endangered
<b><u>Birds</u></b>		
<i>Oporornis formosus</i>	Kentucky Warbler	Protected
<b><u>Butterflies and Skippers</u></b>		
<i>Satyrrium favonius ontario</i>	Northern Oak Hairstreak	Unlisted
<b><u>Dragonflies and Damselflies</u></b>		
<i>Enallagma laterale</i>	New England Bluet	Unlisted*
<b><u>Plants</u></b>		
<i>Asclepias purpurascens</i>	Purple Milkweed	Unlisted
<i>Eleocharis quadrangulata</i>	Angled Spikerush	Endangered

\* indicates species of particular concern for this lake and watershed.

Water Balance:

USGS Mean Annual (inches/year)		Volume (acre-ft/year)	<u>Water Budget:</u>	
Precipitation (P)	48	427	Inflow to Lake [R+(P-ET)]	468 mgal/yr
Evaporation (ET)	22	196	Lake Volume	174 mgal
Runoff (R)	26	1,204	Flushing Rate	2.7 times/year
			Residence Time	0.37 years

Phosphorus Budget:

(A) *Watershed Land Cover:* 2001 National Land Cover Data Set (MRLC). Includes phosphorus export coefficient (kg/ha/year) and estimated phosphorus export.

Description	Watershed (acres)	Cover (%)	Phosphorus Export Coeff	Estim P Export kg/year	Percent
Open water (all)	78	12	0.30	9.5	26
Developed, open space	130	19	0.20	10.5	28
Developed, low intensity	3.6	0.53	0.30	0.432	1.2
Deciduous forest	305	45	0.07	8.63	23
Evergreen forest	35	5.2	0.20	2.82	7.6
Mixed forest	7.1	1.0	0.09	0.257	0.69
Shrub/scrub	0.16	0.02	0.28	0.018	0.05
Pasture/hay	8.3	1.2	0.30	1.01	2.7
Woody wetlands	97	14	2.10	3.55	10
Emergent herbaceous wetlands	12	1.7	0.09	0.467	1.3
<b>Total Acres*</b>	<b>676</b>	<b>100</b>		<b>37.2</b>	<b>100</b>

(B) *Septic:* Assumes that communities around the lake are on septic systems.

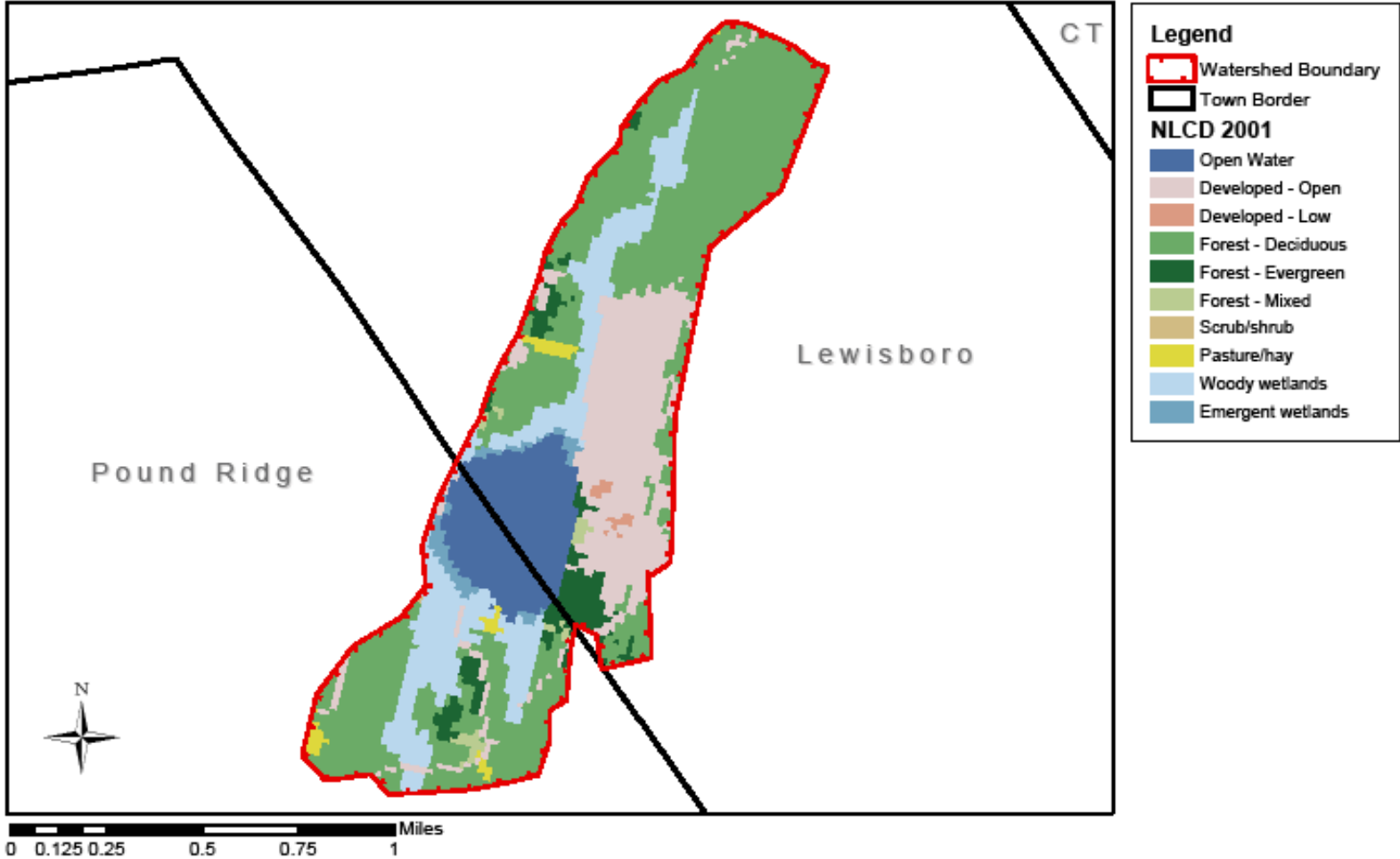
Estimated population on septic by soil suitability class with US 2000 Census household size for 100-meter buffer of surface water.

Class	N Structures	Average Household	Estimated Population*
Not limited	0	2.5	0
Somewhat limited	57	2.5	143
Very limited	71	2.5	175
<b>Total</b>	<b>127</b>		<b>318</b>

Estimated Phosphorus export by Soil Suitability class for 100-meter buffer of surface water, with failure rate of 5%.

Class	Population*	P per cap	Transport	kg/year
Not limited	0	0.6	10%	0
Somewhat limited	135	0.6	30%	24
Very limited	166	0.6	60%	60
Failed systems (5%)	17	0.6	100%	10
<b>Total</b>	<b>318</b>			<b>94</b>

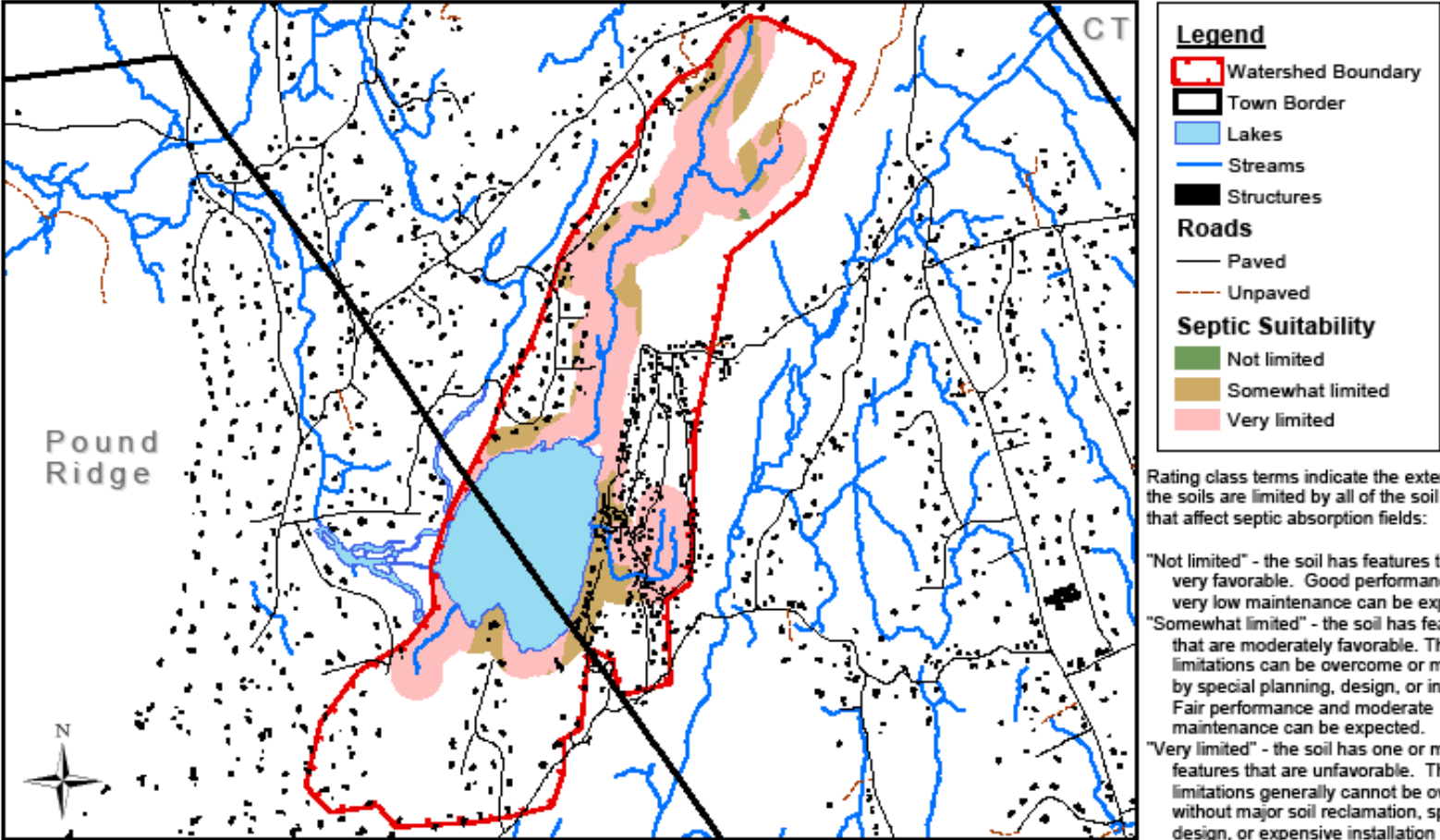
**Figure 3**  
**Lake Kitchawan**  
**National Land Cover Dataset 2001**



**Source:**  
National Land Cover Database zone 65 Land Cover Layer. On-line at <http://www.mrlc.gov>  
The National Land Cover Database 2001 land cover layer for mapping zone 65 was produced through a cooperative project conducted by the Multi-Resolution Land Characteristics (MRLC) Consortium. Minimum mapping unit = 1 acre. Geo-referenced to Albers Conical Equal Area, with a spheroid of GRS 1980, and Datum of NAD83.



**Figure 4**  
**Lake Kitchawan**  
**Soil Septic Suitability, 100-Meter Stream Buffer Within the Watershed**



Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect septic absorption fields:

- "Not limited" - the soil has features that are very favorable. Good performance and very low maintenance can be expected.
- "Somewhat limited" - the soil has features that are moderately favorable. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.
- "Very limited" - the soil has one or more features that are unfavorable. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

0 0.125 0.25 0.5 0.75 1 Miles

**Sources:**  
 Lakes, Streams, Wetlands, Roads and Structures - On-line at Westchester County web site <http://olswww.westchesternov.com/>. Municipal planimetric datasets were photogrammetrically derived from the county's 2004 base map project and meet National Map Accuracy Standards at 1"=100'.  
 Soil Survey of Westchester County - Compiled by Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. On-line at <http://soildatamart.nrcs.usda.gov/>. Accessed November 28, 2007. "Septic tank absorption fields" are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health.



(C) *Point Sources*: There are no known point sources of phosphorus to Lake Kitchawan

(D) *Summary of Phosphorus Input to the Lake*:

Source	Input (kg/year)
Watershed Land Cover	37
Point Sources	0
Septic within 100m of surface water	94
Internal loading (sediment)	0
<b>Total</b>	<b>131</b>

Phosphorus Mass Balance: Empirical estimates of net loss from system based on mean depth and water residence time.

$$p = W'/10+H\rho$$

where:

- p = summer average in-lake TP concentration, ug/l
- W' = areal loading rate, g/m<sup>2</sup>/year
- H = mean depth, m
- ρ = residence time (year)

Parameter	Units	Result
W'	g/m <sup>2</sup> /year	303
H	m	1.7
ρ	flushes per year	0.37
<b>p</b>	<b>ug/l</b>	<b>28</b>
<i>Summer average TP 2007 and 2008, upper waters:</i>		<b>22 ug/l</b>



## REFERENCES

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