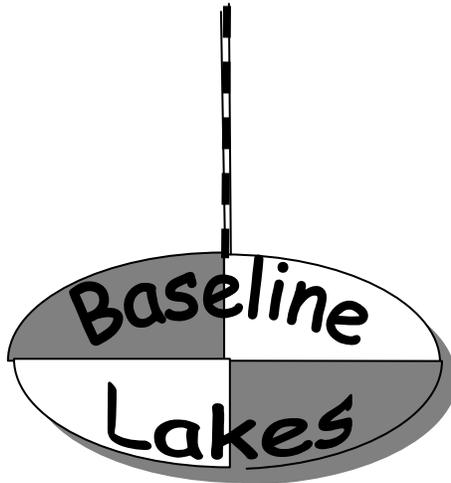


Merrimack River Watershed Lakes Data excerpted from:

**Baseline Lake Survey 2003
Technical Memo**



**Division of Watershed Management
Department of Environmental Protection
627 Main Street, Second Floor
Worcester, MA**

**Baseline Lake Survey 2003
Technical Memo**

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**TM-S-16
DWM Control Number CN 205.0
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Massachusetts Department of Environmental Protection
Division of Watershed Management
Worcester, MA

****Data for lakes sampled in the Merrimack River Watershed are excerpted from the original technical memorandum and are provided below. All methods (field and laboratory) and results (QA/QC, lab audits, field blanks, duplicates and splits) are included in the original technical memorandum and are available upon request to the MassDEP DWM.**

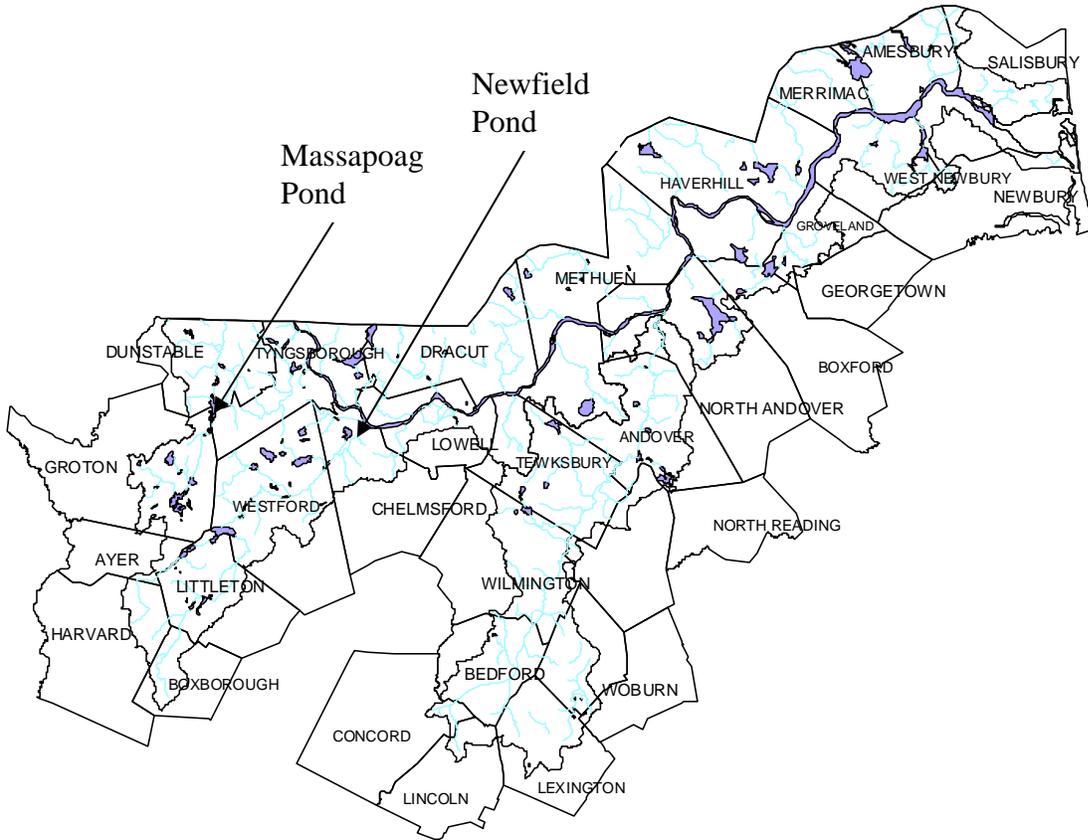


Figure 1. Approximate locations of lakes in the Merrimack Basin

Table 1. Multiprobe Data for 2003 Nutrient Criteria Lakes

Nutrient Criteria, Lakes (2003) (QC Status: 4) Exported: 10/4/2005 11:38:18 AM

Newfield Pond (PALIS: 84046)**Unique_ID: W0716 Station: A**

Description: [deep hole in southeastern quadrant near outlet, Chelmsford.]

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/L)	DO (mg/L)	SAT (%)
08/13/03									
	LC-0231	13:02	0.5	27.8	7.9 c	499	319	8.2	105
	LC-0231	13:19	1.5	27.1 u	7.8 c	499	319	7.9	100
	LC-0231	13:33	2.5	26.0	7.0 c	495	317	5.4 u	68 u
	LC-0231	13:38	3.4	24.3 u	6.8	513 u	328 u	5.0 u	61 u
	LC-0231	13:45	4.5	19.2	6.7	525	336	1.5 u	17 u
	LC-0231	13:50	5.5	14.1 um	6.8 m	527 m	337 m	<0.2 m	<2 m

Massapoag Pond (PALIS: 84087)**Unique_ID: W0718 Station: A**

Description: [deep hole, center of large eastern lobe, Dunstable/Tyngsborough.]

Date	OWMID	Time (24hr)	Depth (m)	Temp (°C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/L)	DO (mg/L)	SAT (%)
07/15/03									
	LC-0237	15:41	0.6	25.5 u	7.4 cu	235	150	8.0 u	99 u
	LC-0237	15:49	1.0	24.7	7.4 c	235	150	7.9	96
	LC-0237	16:27	2.1	23.9	7.2 c	236	151	7.9	94
	LC-0237	15:55	3.1	20.3 u	7.1 c	232	149	9.1 u	101 u
	LC-0237	16:00	4.0	14.6 u	6.6	234	150	1.4 u	14 u
	LC-0237	16:09	6.0	8.9 u	6.4	217	139	0.4	3
	LC-0237	16:15	8.0	6.1	6.7 u	240	154	<0.2	<2
	LC-0237	16:21	11.2	5.3	7.3 c	313	200	<0.2	<2

General Data Symbols :

“##” = Censored data (i.e., data that has been discarded for some reason). *NOTE: Prior to 2001 data, “**” denoted either censored or missing data.*

“**” = Missing data (i.e., data that should have been reported). See NOTE above.

“--” = No data (i.e., data not taken/not required)

* = Analysis performed by Laboratory OTHER than MassDEP’s Wall Experiment Station (WES)

[] = A result reported inside brackets has been “censored”, but is shown for informational purposes (e.g., high blank results).

Multi-probe-specific Qualifiers:

“i” = inaccurate readings from Multi-probe likely; pre/post-survey calibration problems etc.

“m” = method not followed; one or more protocols contained in the MassDEP Multi-probe SOP not followed, ie. operator error or instrument failure not allowing method to be implemented.

“s” = field sheet recorded data were used to accept data, not data electronically recorded in the Multi-probe surveyor unit, due to operator error or equipment failure.

“u” = unstable readings, due to lack of sufficient equilibration time prior to final readings, non-representative location, highly-variable water quality conditions, etc. See Section 4.1 for acceptance criteria.

“c” = greater than calibration standard used for pre-calibration, or outside the acceptable range about the calibration standard. It can also be used for TDS and Salinity calculations based on qualified (“c”) conductivity data, or that the calculation was not possible due to censored conductivity data (TDS and Salinity are calculated values and entirely based on conductivity reading).

“r” = data not representative of actual field conditions.

Table 2. Water Quality Data for Nutrient Criteria Lakes

Nutrient Criteria, Lakes (2003) (QC Status: 4) Exported: 10/14/2005 12:03:13 PM

Massapoag Pond (PALIS: 84087)

Unique_ID: W0718 Station: A

Description: [deep hole, center of large eastern lobe, Dunstable/Tyngsborough.]

Date	Secchi	Secchi Time	Station Depth	OWMID	QAQC	Time	SmpTyp	Sample Depth	Chl-a	NO3-NO2-N	TKN	TN	TP	AppColor
	m	24hr	m			24hr		m	mg/m3	mg/L	mg/L	mg/L	mg/L	PCU
07/15/03	3.4	15:40	11.8											
				LC-0234	--	16:10	VDOR	11.3	--	--	--	--	##* m	--
				LC-0233	--	15:50	MNGR	<0.5	--	--	--	--	##* m	35*
				LC-0235	LC-0236	16:05	DINT	0 - 7.0	17.4*	--	--	--	--	--
				LC-0236	LC-0235	16:06	DINT	0 - 7.0	16.5*	--	--	--	--	--

Newfield Pond (PALIS: 84046)

Unique_ID: W0716 Station: A

Description: [deep hole in southeastern quadrant near outlet, Chelmsford.]

Date	Secchi	Secchi Time	Station Depth	OWMID	QAQC	Time	SmpTyp	Sample Depth	Chl-a	NO3-NO2-N	TKN	TN	TP	AppColor
	m	24hr	m			24hr		m	mg/m3	mg/L	mg/L	mg/L	mg/L	PCU
08/13/03	3.8	12:55	8.2											
				LC-0226	LC-0227	13:30	VDOR	0.2	--	<0.06	0.36	--	0.011	<15*
				LC-0227	LC-0226	13:32	VDOR	0.2	--	<0.06	0.35	--	##* m	<15*
				LC-0228	--	13:35	VDOR	6.5	--	<0.02	0.68	--	##* m	--
				LC-0230	--	13:08	DINT	0 - 7.0	22.3*	--	--	--	--	--

Sample-Specific Data Qualifiers:

“ a ” = accuracy as estimated at WES Lab via matrix spikes, PT sample recoveries, internal check standards and lab-fortified blanks did not meet project data quality objectives identified for program or in QAPP.

“ b ” = blank Contamination in lab reagent blanks and/or field blank samples (indicating possible bias high and false positives).

“ d ” = precision of field duplicates (as RPD) did not meet project data quality objectives identified for program or in QAPP. Batched samples may also be affected.

“ e ” = not theoretically possible. Specifically, used for bacteria data where colonies per unit volume for e-coli bacteria > fecal coliform bacteria, for lake Secchi and station depth data where a specific Secchi depth is greater than the reported station depth, and for other incongruous or conflicting results.

“ f ” = frequency of quality control duplicates did not meet data quality objectives identified for program or in QAPP.

“ h ” = holding time violation (usually indicating possible bias low)

“ j ” = ‘estimated’ value; used for lab-related issues where certain lab QC criteria are not met and re-testing is not possible (as identified by the WES lab only).

Also used to report sample data where the sample concentration is less than the ‘reporting’ limit or RDL and greater than the method detection limit or MDL (mdl < x < rdl). Also used to note where values have been reported at levels less than the mdl.

“ m ” = method SOP not followed, only partially implemented or not implemented at all, due to complications with sample matrix (eg. sediment in sample, floc formation), lab error (eg. cross-contamination between samples), additional steps taken by the lab to deal with matrix complications, lost/unanalyzed samples, and missing data.

“ p ” = samples not preserved per SOP or analytical method requirements.

“ r ” = samples collected may not be representative of actual field conditions, including the possibility of “outlier” data and flow-limited conditions (e.g., pooled).

Key to data codes:

“ ## ” = Censored data; “ ** ” = Missing data; “ -- ” =No data; “*” =other lab;

SymTyp: Sample Type- VDOR= Van Dorn; DINT= Depth integrated by vertical hose; MNGR= Manual Grab; NR= not recorded.

Appendix II Duplicates Result

Nutrient Criteria, Lakes (2003) (QC Status: 4) Exported: 10/13/2005 4:02:25 PM Duplicates.

Massapoag Pond (PALIS: 84087)

Unique_ID: W0718 Station: A

Description: [deep hole, center of large eastern lobe, Dunstable/Tyngsborough.]

Date	OWMID	QAQC	Time	Depth	Chl-a	NO3-NO2-N	TKN	TN	TP	AppColor
	--	--	(24hr)	(m)	mg/m3	mg/L	mg/L	mg/L	mg/L	PCU
7/15/2003	LC-0235	LC-0236	16:05	0 - 7.0	17.4*	--	--	--	--	--
7/15/2003	LC-0236	LC-0235	16:06	0 - 7.0	16.5*	--	--	--	--	--
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>			5.3%	--	--	--	--	--

Newfield Pond (PALIS: 84046)

Unique_ID: W0716 Station: A

Description: [deep hole in southeastern quadrant near outlet, Chelmsford.]

Date	OWMID	QAQC	Time	Depth	Chl-a	NO3-NO2-N	TKN	TN	TP	AppColor
	--	--	(24hr)	(m)	mg/m3	mg/L	mg/L	mg/L	mg/L	PCU
8/13/2003	LC-0226	LC-0227	13:30	0.2	--	<0.06	0.36	--	0.011	<15*
8/13/2003	LC-0227	LC-0226	13:32	0.2	--	<0.06	0.35	--	##* m	<15*
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>			--	0.0%	2.8%	--	--	0.0%

Sample-Specific Data Qualifiers:

“ a ” = accuracy as estimated at WES Lab via matrix spikes, PT sample recoveries, internal check standards and lab-fortified blanks did not meet project data quality objectives identified for program or in QAPP.

“ b ” = blank Contamination in lab reagent blanks and/or field blank samples (indicating possible bias high and false positives).

“ d ” = precision of field duplicates (as RPD) did not meet project data quality objectives identified for program or in QAPP. Batched samples may also be affected.

“ e ” = not theoretically possible. Specifically, used for bacteria data where colonies per unit volume for e-coli bacteria > fecal coliform bacteria, for lake Secchi and station depth data where a specific Secchi depth is greater than the reported station depth, and for other incongruous or conflicting results.

“ f ” = frequency of quality control duplicates did not meet data quality objectives identified for program or in QAPP.

“ h ” = holding time violation (usually indicating possible bias low)

“ j ” = ‘estimated’ value; used for lab-related issues where certain lab QC criteria are not met and re-testing is not possible (as identified by the WES lab only). Also used to report sample data where the sample concentration is less than the ‘reporting’ limit or RDL and greater than the method detection limit or MDL (mdl < x < rdl). Also used to note where values have been reported at levels less than the mdl.

“ m ” = method SOP not followed, only partially implemented or not implemented at all, due to complications with sample matrix (eg. sediment in sample, floc formation), lab error (eg. cross-contamination between samples), additional steps taken by the lab to deal with matrix complications, lost/unanalyzed samples, and missing data.

“ p ” = samples not preserved per SOP or analytical method requirements.

“ r ” = samples collected may not be representative of actual field conditions, including the possibility of “outlier” data and flow-limited conditions (e.g., pooled).

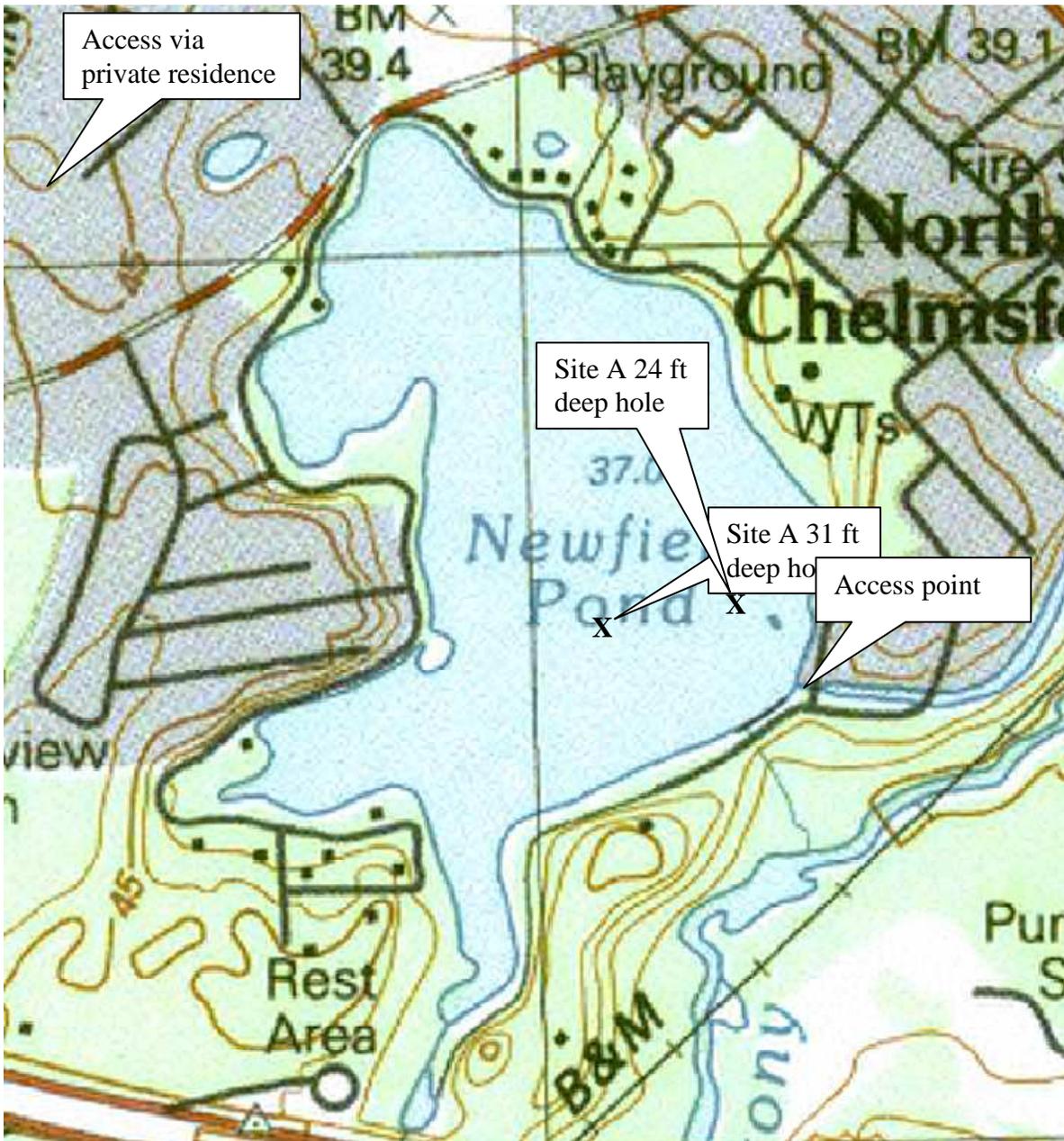
Key to data codes:

“ ## ” = Censored data; “ ** ” = Missing data; “ -- ” = No data; “ * ” = other lab;

SymTyp: Sample Type- VDOR= Van Dorn; DINT= Depth integrated by vertical hose;

MNGR= Manual Grab; NR= not recorded.

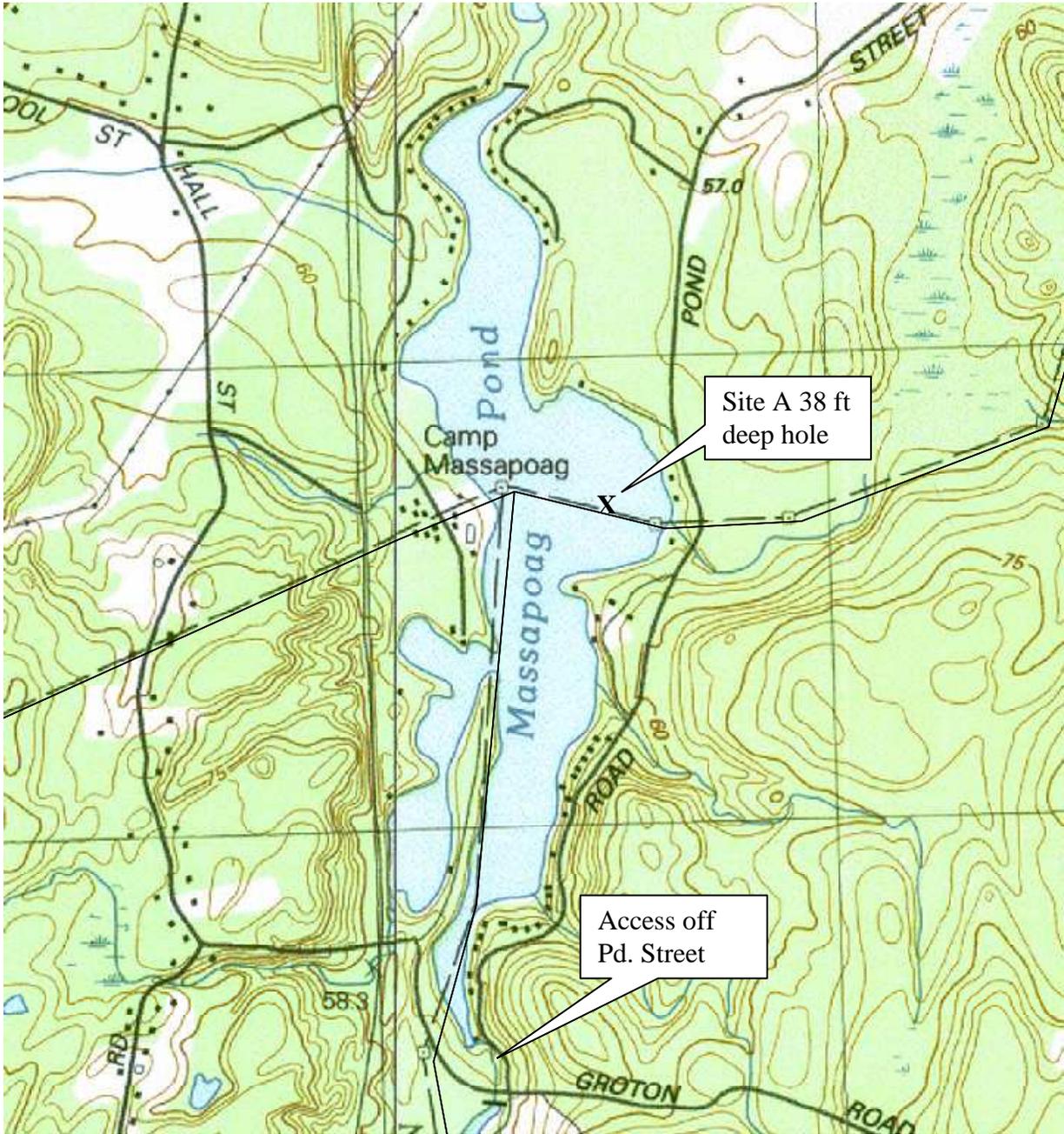
Appendix IV. Local Environs Maps in Palis order.



Newfield Pond
Chelmsford
84046

200 0 200 400 Meters

700 0 700 1400 Feet



Massapoag Pond
Dunstable
84087

200 0 200 400 Meters



700 0 700 1400 Feet

