

Miscoe Hill Pond

Mendon, MA

Prepared For: Mr. Carl Hommel
Prepared By: Colin Gosselin, Water & Wetland, LLC
August 21, 2020

Introduction

Miscoe Hill Pond is an approximately 5.6 acre freshwater pond located in Mendon, MA. The pond is shallow, with an average depth of approximately two-feet and a maximum depth of approximately four feet (based on basic depth polling conducted on August 5, 2020). The pond has largely been taken over by wetland as encroaching water willow and water lily species have overtaken approximately 75% of the surface acreage. A brief visual survey of the waterbody was conducted on August 5, 2020 and basic water quality was measured. The results and brief recommendations are below.

Water Quality

Parameter	Units	Result
E. Coli	Col/100ml	230
Total Alkalinity	Mg CaCO ₃ /L	20
Nitrate Nitrogen	mg/l	ND
pH	SU	6.5
Total Phosphorous	Mg/l	.069
Turbidity	NTU	4.8

E. Coli: E.Coli is a potentially harmful fecal coliform bacteria that can be harmful to humans and pose a health threat. Levels should not exceed 235 colonies/100ml or greater in recreation areas. Levels at Miscoe Hill Pond were just under the acceptable limits. This should be closely monitored in the future.

Total Alkalinity : Total Alkalinity is waters ability to resist change in PH. A Pond needs a reading of at Least 20 to be considered healthy. Miscoe Hills Alkalinity reading is low, but within a normal range.

Nitrate Nitrogen: Nitrate nitrogen is to the growth of algae. Nitrate is the oxidized nitrogen and is often readily free for algae uptake. Normal freshwater systems have <1 mg/l. Potential harmful levels are between 1-10. A count higher than ten is possibly toxic and above many regulated guidelines. Nitrate Nitrogen at Miscoe Hill Pond was below a detectable limit.

pH: pH is used to determine how acidic or neutral a waterbody is. A pH of 7 is considered to be neutral. Miscoe Hill Pond had a pH of 6.5 which is in the desired range of 5.5 – 8.0.

Total Phosphorus: Total phosphorous is a nutrient that is essential for plants and algae to grow. The higher level of phosphorus you have means the more plants and algae you have in a waterbody. Total phosphorous levels at Miscoe Hill Pond were not high enough to cause alarm.

Turbidity: Turbidity is either planktonic organisms or suspended soil particles in the water column that interfere with the penetration of light. Although many drinking water supplies strive to achieve a rating of 1 NTU, Miscoe Hill’s reading of 4.8 is acceptable and normal for a Pond in New England.

Temperature/Dissolved Oxygen

Location	Temperature	DO
Surface	28.7°C	10.34 mg/L
1 ft	28.2°C	9.57 mg/L
2 ft	26.9°C	8.77 mg/L
3 ft	25.0°C	7.83 mg/L
bottom	24.9°C	4.08 mg/L

Temperature / Dissolved Oxygen: Temperature and oxygen profiles (as seen in the table above) determine the degree of stratification and potential for depletion of oxygen. Dissolved oxygen can be affected by many outside factors, such as: temperature, time of day, and pollution. Fish and other aquatic organisms typically require a minimum of four to five milligrams per liter (mg/l) of oxygen. Oxygen readings at Miscoe Hill pond were taken in one-foot increments using a calibrated YSI meter. Healthy water should generally have concentrations about 6.5-8 mg/L. Readings at Miscoe Hill Pond showed sufficient dissolved oxygen throughout most of the water column, and declined with depth, as is usually the case.

The amount of dissolved oxygen a pond can hold is largely determined by water temperature. When the water temperature is cooler, it can hold more oxygen. Temperatures in Miscoe Hill Pond, as measured using a calibrated YSI meter, showed high water temperatures, as to be expected in a shallow pond during the summer months. Generally, water cannot hold oxygen at levels that will support fish when above 85 degrees Fahrenheit. The surface water temperature at Miscoe Hill Pond was approximately 83.66 degrees Fahrenheit.

Vegetation

Vegetation at Miscoe Hill Pond was assessed visually with the assistance of a throw-rake from shore and a canoe. No invasive species were found in Miscoe Hill Pond. The pond has largely been over-taken by water willow and water lily species. Submersed vegetation was largely dominated by coontail. Generally speaking, the pond has very little open-water habitat. Dense floating vegetation can limit sunlight and thus decrease dissolved oxygen.

Recommendations

Miscoe Hill Pond has been overtaken by floating leaf and emergent vegetation throughout most of the waterbody. Dredging could increase open water habitat but is extremely expensive and in many cases is ruled out due to cost alone. You could expect a dredge project to cost in the millions. Typically, this process begins with a dredging feasibility study. Mechanical hydro-raking could be

conducted to remove water willow, plant material, lily rhizomes and unconsolidated organic matter. This strategy is permitted through the Town Conservation Commission under the Massachusetts Wetlands Protection Act. Average production of water willow removal with a mechanical hydro-rake is approximately 1/10 acre per day at a cost of approximately \$2,000 per day. Based on these figures, mechanical hydro-raking can cost more than \$25,000 per acre when including off-shore disposal. Access for a mechanical hydro-rake into Miscoe Hill Pond will be challenging and would require that either a launch be created, or a crane be used.

Chemical treatment in the deeper section of Miscoe Hill Pond (approximately 2 acres), may be an option to keep an area of open water habitat. One chemical option is Sonar (fluridone) made by SePro. This product is effective on growth regulating native pond-weed species while managing water lilies, when applied at a high enough concentration. Treatment of approximately 2 – acres of vegetation in Miscoe Hill Pond is likely about a \$3,000 effort.

With either mechanical hydro-raking or herbicide application, a Notice of Intent with the Mendon Conservation Commission would need to be filed. You can expect this permitting process to cost approximately \$5,000-\$7,500.

E. Coli counts were just below a threshold safe for recreation. We recommend regular monitoring of water quality, with special regard to E. Coli. Given the proximity of Miscoe Hill Pond to the Water & Wetland office, we can offer this service at a fairly low cost.

Lastly, it is worth mentioning that a beaver dam was noted at the outflow of Miscoe Hill Pond. This seems to have raised the water level and decreased/stopped flow. This could further be further investigated by an expert. We would typically recommend GZA Environmental to assist with an assessment of the flow/impacts. In the event the Town desires to control the beavers, we typically recommend Mike Callahan at Beaver Solutions.

As is always the case, but especially important here with the surrounding ball fields, we recommend using best management practices. These practices

include not using fertilizers on lawns/turf or using non-phosphorous fertilizers when not fertilizing is not an option. Miscoe Hill Pond is wooded around the entire perimeter, encouraging this beneficial buffer will also help limit nutrient input into the pond.



ANALYTICAL REPORT

Lab Number:	L2031649
Client:	Water & Wetland, LLC 115 South Street Upton, MA 01568
ATTN:	Joseph Onorato
Phone:	(888) 493-8526
Project Name:	MISCOE HILL POND
Project Number:	Not Specified
Report Date:	08/14/20

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2031649-01	#1 ECOLI	WATER	MENDON, MA	08/05/20 13:15	08/05/20
L2031649-02	#2 TOTAL ALK	WATER	MENDON, MA	08/05/20 13:15	08/05/20
L2031649-03	#3 NITRATE NITROGEN	WATER	MENDON, MA	08/05/20 13:15	08/05/20
L2031649-04	#4 PH	WATER	MENDON, MA	08/05/20 13:15	08/05/20
L2031649-05	#5 TOTAL PHOSPHORUS	WATER	MENDON, MA	08/05/20 13:15	08/05/20
L2031649-06	#6 TURBIDITY	WATER	MENDON, MA	08/05/20 13:15	08/05/20

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Case Narrative (continued)

Sample Receipt

The analyses performed were specified by the client.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Caitlin Walukevich

Title: Technical Director/Representative

Date: 08/14/20

INORGANICS & MISCELLANEOUS

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-01
Client ID: #1 ECOLI
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	230		col/100ml	10	NA	10	-	08/05/20 19:30	121,9213D	CM



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-02
Client ID: #2 TOTAL ALK
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Total	20.0		mg CaCO3/L	2.00	NA	1	-	08/06/20 09:52	121,2320B	BR



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-03
Client ID: #3 NITRATE NITROGEN
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Nitrogen, Nitrate	ND		mg/l	0.100	--	1	-	08/06/20 06:56	121,4500NO3-F	MR



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-04
Client ID: #4 PH
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
pH (H)	6.5		SU	-	NA	1	-	08/05/20 20:22	1,9040C	AS



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-05
Client ID: #5 TOTAL PHOSPHORUS
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Phosphorus, Total	0.069		mg/l	0.010	--	1	08/07/20 11:00	08/10/20 13:25	121,4500P-E	SD



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

SAMPLE RESULTS

Lab ID: L2031649-06
Client ID: #6 TURBIDITY
Sample Location: MENDON, MA

Date Collected: 08/05/20 13:15
Date Received: 08/05/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	4.8		NTU	0.20	--	1	-	08/06/20 08:09	121,2130B	JA



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1395575-1										
Nitrogen, Nitrate	ND		mg/l	0.100	--	1	-	08/06/20 06:35	121,4500NO3-F	MR
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1396052-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	08/05/20 19:30	121,9213D	CM
General Chemistry - Westborough Lab for sample(s): 06 Batch: WG1396178-1										
Turbidity	ND		NTU	0.20	--	1	-	08/06/20 08:09	121,2130B	JA
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1396264-1										
Alkalinity, Total	ND		mg CaCO3/L	2.00	NA	1	-	08/06/20 09:52	121,2320B	BR
General Chemistry - Westborough Lab for sample(s): 05 Batch: WG1396652-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	08/07/20 11:00	08/10/20 13:12	121,4500P-E	SD

Lab Control Sample Analysis

Batch Quality Control

Project Name: MISCOE HILL POND

Project Number: Not Specified

Lab Number: L2031649

Report Date: 08/14/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG1395575-2								
Nitrogen, Nitrate	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 04 Batch: WG1396036-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 06 Batch: WG1396178-2								
Turbidity	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1396264-2								
Alkalinity, Total	104		-		90-110	-		10
General Chemistry - Westborough Lab Associated sample(s): 05 Batch: WG1396652-2								
Phosphorus, Total	103		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1395575-4 QC Sample: L2031629-04 Client ID: MS Sample												
Nitrogen, Nitrate	ND	4	4.23	106	-	-	-	-	83-113	-	-	17
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1396264-4 QC Sample: L2031339-01 Client ID: MS Sample												
Alkalinity, Total	332	100	386	54	Q	-	-	-	86-116	-	-	10
General Chemistry - Westborough Lab Associated sample(s): 05 QC Batch ID: WG1396652-3 QC Sample: L2031539-01 Client ID: MS Sample												
Phosphorus, Total	0.357	0.5	0.851	99	-	-	-	-	75-125	-	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1395575-3 QC Sample: L2031629-04 Client ID: DUP Sample						
Nitrogen, Nitrate	ND	ND	mg/l	NC		17
General Chemistry - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1396036-2 QC Sample: L2031462-01 Client ID: DUP Sample						
pH	8.0	7.9	SU	1		5
General Chemistry - Westborough Lab Associated sample(s): 06 QC Batch ID: WG1396178-3 QC Sample: L2031649-06 Client ID: #6 TURBIDITY						
Turbidity	4.8	4.8	NTU	0		13
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1396264-3 QC Sample: L2031339-01 Client ID: DUP Sample						
Alkalinity, Total	332	324	mg CaCO ₃ /L	2		10
General Chemistry - Westborough Lab Associated sample(s): 05 QC Batch ID: WG1396652-4 QC Sample: L2031539-01 Client ID: DUP Sample						
Phosphorus, Total	0.357	0.349	mg/l	2		20

Project Name: MISCOE HILL POND**Lab Number:** L2031649**Project Number:** Not Specified**Report Date:** 08/14/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2031649-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2031649-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2031649-02A	Plastic 250ml unpreserved/No Headspace	A	NA		3.7	Y	Absent		ALK-T-2320(14)
L2031649-03A	Plastic 250ml unpreserved	A	6	6	3.7	Y	Absent		NO3-4500(2)
L2031649-04A	Plastic 120ml unpreserved	A	6	6	3.7	Y	Absent		PH-9040(1)
L2031649-05A	Plastic 250ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28)
L2031649-06A	Plastic 250ml unpreserved	A	6	6	3.7	Y	Absent		TURB-2130(2)

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report



Project Name: MISCOE HILL POND**Lab Number:** L2031649**Project Number:** Not Specified**Report Date:** 08/14/20

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration. (DoD and NYSDEC Part 375 PFAS only.)
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: Data Usability Report



Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

Data Qualifiers

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: MISCOE HILL POND
Project Number: Not Specified

Lab Number: L2031649
Report Date: 08/14/20

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE _____ OF _____

Date Rec'd in Lab: **8/5/20**

ALPHA Job #: **L 2031649**

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: **Miscue Hill Pond**

Project Location: **Mendon MA**

Project #: **1**

Project Manager: **Colin Gosselin**

ALPHA Quote #:

Report Information - Data Deliverables

ADEx EMAIL

Billing Information

Same as Client info PO #:

Client Information

Client: **Water and Wetland**

Address: **115 South St
Upton MA**

Phone: **508-259-3153**

Email: **info@waterandwetland.com**

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program **Town of Mendon** Criteria

ANALYSIS	VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2
	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH
	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15
	METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PP13
	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only
	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only
	PCB <input type="checkbox"/> PEST
	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint
	Ecoli A2
	T. Aik
	Nitrate Nitrogen
	pH
	Total Phosphorus
	Toxicity
	SAMPLE INFO
	Filtration
	<input type="checkbox"/> Field
	<input type="checkbox"/> Lab to do
	Preservation
	<input type="checkbox"/> Lab to do
	Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
31649-01	#1 Ecoli	8/5	1:15		CB
-02	#2 Total Aik	8/5	1:15		CB
-03	#3 Nitrate Nitrogen	8/5	1:15		CB
-04	#4 pH	8/5	1:15		CB
-05	#5 Total Phosphorus	8/5	1:15		CB
-06	#6 Toxicity	8/5	1:15		CB

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO3
D= H2SO4
E= NaOH
F= MeOH
G= NaHSO4
H= Na2S2O3
I= Ascorbic Acid
J= NH4Cl
K= Zn Acetate
O= Other

Container Type

Preservative

Relinquished By:

Date/Time

Received By:

Date/Time

[Signature] **APL 8/5/20 14:20**

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)