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## VIA EMAIL

August 12, 2022  
File No. 04.0191303.00

Mr. Barry Gier, P.E.  
Jones & Beach Engineers, Inc.  
P.O. Box 219  
Stratham, New Hampshire 03885

Re: Vernal Pool Assessment Report  
Moors Road, Tax Map 72, Lot 13-1  
Nottingham, New Hampshire

Dear Mr. Gier:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide this letter report detailing the completion of vernal pool assessment services at the parcel identified as Tax Map 72, Lot 13-1, located off Moores Road in Nottingham, New Hampshire (i.e. Site). The Site is approximately 56 acres and is predominantly forested land. The Site also contains an existing barn and associated small field. The Site is bordered to the east, south, and north by Moores Road and to the west by Jampsa Trail. The vernal pool assessment field work was performed by Ms. Tracy Tarr, State of New Hampshire Certified Wetland Scientist (#081) and Certified Wildlife Biologist, and field scientist Sydney Wicklund on May 24 and 27, 2022. This report is subject to the attached **Limitations**.

The purpose of the work was to assess potential vernal pool locations on the Site, as requested by Jones & Beach Engineers, Inc. Six potential vernal pools were previously identified during wetland delineation conducted on September 14 and 15, 2021 (see GZA Wetland Delineation Report dated September 23, 2021.) Therefore, GZA conducted an in-field assessment of the six potential vernal pool habitats (i.e., Pools 1-6, see **Table 1** and **Figure 1**) in accordance with *Identification and Documentation of Vernal Pools in New Hampshire*, third edition, 2016 as outlined in the New Hampshire Code of Administrative Rules, ENV-Wt 103.64, 104.15, and 104.44 to support local and state permitting. Based on observations in May 2022, four of the assessed areas are confirmed vernal pools and the remaining two areas are considered potential vernal pools due to observed hydroperiod, as discussed below.

### POOL 1

Pool 1 is located in the westernmost portions of the Site and is demarcated by the A-line and B-line wetland flags (see **Figure 1 – Wetland Delineation Sketch**). Pool 1 is located within Wetland 1 and is classified as a palustrine emergent and forested wetland system dominated by broad-leaved deciduous and evergreen vegetation that is seasonally and permanently flooded/saturated (PFO1/4E). Pool 1 is a confirmed vernal pool based on the presence of secondary indicators including predacious diving beetle (*Acilus/Graphoderus* spp.) larvae, water scavenger beetle (family Hydrophilidae) larvae, and phantom midges (family Chaoboridae). At the time of the survey, the pool contained approximately six inches of water on average. Dominant vegetation in the wetland includes cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), fringed sedge (*Carex crinita*), sphagnum moss (*Sphagnum* spp.), American bur-reed (*Sparganium Americanum*), goldthread (*Coptis trifolia*), highbush blueberry (*Vaccinium corymbosum*),



meadowsweet (*Spiraea alba*), maleberry (*Lyonia ligustrina*), common winterberry (*Ilex verticillata*), American witch-hazel (*Hamamelis virginiana*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), black gum (*Nyssa sylvatica*), eastern hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*)

#### POOL 2

Pool 2 is located in the westernmost portions of the Site and is demarcated by the A-line and B-line wetland flags (see **Figure 1 – Wetland Delineation Sketch**). Pool 2 is located within Wetland 1 which is classified as a palustrine emergent and forested wetland system dominated by broad-leaved deciduous and evergreen vegetation that is seasonally and permanently flooded/saturated (PFO1/4E,PFO1/4Fg). Pool 2 lacked evidence of primary indicator species. In addition, GZA observed only one secondary indicator species (i.e. predacious diving beetle larvae) during May 2022. Therefore, Pool 2 is not considered a confirmed vernal pool. However, in Pool 2 the deepest depths ranged from approximately 6 inches to 1 foot of water and appear to have adequate hydroperiod to support indicator species. Therefore, this area is considered a potential vernal pool for planning purposes. Dominant vegetation in the wetland includes cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), fringed sedge (*Carex crinita*), sphagnum moss (*Sphagnum spp.*), American bur-reed (*Sparganium Americanum*), goldthread (*Coptis trifolia*), highbush blueberry (*Vaccinium corymbosum*), meadowsweet (*Spiraea alba*), maleberry (*Lyonia ligustrina*), common winterberry (*Ilex verticillata*), American witch-hazel (*Hamamelis virginiana*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), black gum (*Nyssa sylvatica*), eastern hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*).

#### POOL 3

Pool 3 is located in the westernmost portions of the Site and is demarcated by the A-line and B-line wetland flags (see **Figure 1 – Wetland Delineation Sketch**). Pool 3 is located within Wetland 1 and is classified as a palustrine emergent wetland system that is semi-permanently flooded (PEM1F). The pool boundary appears to be an old farm pond. GZA observed a spotted salamander egg mass within the pool. Therefore, Pool 3 is a confirmed vernal pool. In addition, GZA observed two secondary indicator species including dragonfly and damselfly larvae. Dominant vegetation in and bordering the pool basin include black birch (*Betula lenta*), red maple (*Acer rubrum*), white pine (*Pinus strobus*), meadowsweet (*Filipendula ulmaria*), speckled alder (*Alnus incana*), highbush blueberry (*Vaccinium corymbosum*), bur-reed (*Sparganium Americanum*), and watermilfoils (*myriophyllum spicatum*).

#### POOL 4

Pool 4 is located in the northernmost portion of the Site and is demarcated by the D-line wetland flags (see **Figure 1 – Wetland Delineation Sketch**). Pool 4 is located within Wetland 3 which is classified as a palustrine forested wetland system dominated by broad-leaved deciduous and evergreen vegetation that is seasonally flooded/saturated (PFO1/4E). Pool 4 lacked primary indicator species and only contained one secondary indicator species (i.e. predacious diving beetle larvae), and is therefore not a confirmed vernal pool. However, the pool contained a small area of standing water and may function as a vernal pool in other years and is therefore considered a potential vernal pool for planning purposes. Dominant vegetation in the wetland includes cinnamon fern, sensitive fern, highbush blueberry, common winterberry, red maple, yellow birch, eastern hemlock, and white pine.

#### POOL 5

Pool 5 is located in the northernmost portion of the Site and is demarcated by the F-line wetland flags (see **Figure 1 – Wetland Delineation Sketch**). Pool 5 is located within Wetland 5 which is classified as a palustrine forested wetland system dominated by broad-leaved deciduous and evergreen vegetation that is permanently flooded/saturated (PFO/4E, PFO1/4Fg). GZA observed seven spotted salamander egg masses and the pool is therefore a confirmed vernal pool based on the presence of primary indicator species. The center of the pool had water depths ranging from one to two feet. Diving beetle larvae, a



secondary indicator species, were also observed. Dominant vegetation in the wetland includes cinnamon fern, sensitive fern, highbush blueberry, common winterberry, red maple, yellow birch, eastern hemlock, and white pine.

POOL 6

Pool 6 is located in the northeastern portion of the Site and contains the G-line wetland flags 1-14 (see **Figure 1 – Wetland Delineation Sketch**). Pool 6 is located within Wetland 6 which is classified as a palustrine emergent and scrub-shrub wetland system dominated by broad-leaved deciduous vegetation that is permanently flooded/saturated (PFO1/4E, PFO1/4Fg). GZA observed one spotted salamander egg mass and multiple wood frog tadpoles spotted during the May survey. Therefore, the pool supports two primary indicator species and is a confirmed vernal pool. GZA also observed two secondary species including clam shrimp and Chironomid midges. Dominant vegetation in the wetland includes cinnamon fern, sensitive fern, marsh fern (*Thelypteris palustris*), sphagnum moss, highbush blueberry, common winterberry, red maple, yellow birch, eastern hemlock, and white pine.

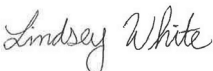
Table 1. Summary of vernal pools.

Pool Identification	Wetland Identification	Confirmed Vernal Pool	Egg Masses		Tadpoles	5/24/22
			5/24/2022 and 5/27/22		Wood Frog	Secondary Indicator Species
			Wood Frog	Spotted Salamander		
Pool 1	Wetland 1	Yes	0	0	3	4
Pool 2	Wetland 1	No	0	0	0	1
Pool 3	Wetland 1	Yes	0	1	0	2
Pool 4	Wetland 3	No	0	0	0	1
Pool 5	Wetland 5	Yes	0	7	0	1
Pool 6	Wetland 6	Yes	0	1	observed	2

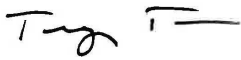
GZA has completed a vernal pool assessment at the Site resulting in the identification of three confirmed vernal pools within 8 wetlands, as detailed above. Please feel free to contact Ms. Lindsey White at 603-232-8753 or [lindsey.white@gza.com](mailto:lindsey.white@gza.com) if you have any questions regarding this Vernal Pool Assessment Report.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

  
 Lindsey White, CPSS  
 Project Manager

  
 Deborah M. Zarta Gier, CNRP  
 Consultant / Reviewer

  
 Tracy L. Tarr, CWS, CWB, CESSWI  
 Associate Principal

LEW/TLT/DMZ:jlj  
 \\GZABedford\Jobs\04\Jobs\0191300s\04.0191303.00\Work\Vernal Pool Report\FINAL 04.0191303.00 - Vernal Pool Report Letter 081222.docx

- Attachments: Figure 1 – Wetland Delineation Sketch  
 Appendix A – Limitations  
 Appendix B – Photo Log  
 Appendix C – Vernal Pool Data Sheets



**Figure 1 – Wetland Delineation Sketch**



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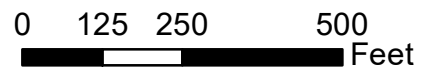
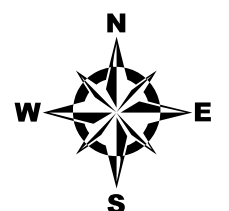


**Legend**

- NHD FLOWLINES
- SITE BOUNDARY
- POOLS
- WETLANDS
- 2FT CONTOURS
- PARCELS

**NOTES:**

1. WETLANDS WERE DELINEATED BY GZA GEOENVIRONMENTAL, INC. (GZA) ON SEPTEMBER 15, 2021 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, AND THE 2012 ARMY CORPS OF ENGINEERS REGIONAL SUPPLEMENT FOR NORTHCENTRAL AND NORTHEAST REGION (VERSION 2.0).
2. VERNAL POOLS WERE EVALUATED BY GZA ON MAY 24 AND 27, 2022 IN ACCORDANCE WITH IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE, THIRD EDITION, 2016.
3. NHD FLOWLINES, 2FT CONTOURS, SITE BOUNDARY AND PARCELS WERE OBTAINED FROM NH GRANIT CLEARINGHOUSE.



XX	XXXX	XX	XX
NO.	ISSUE / DESCRIPTION	BY	DATE

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

**MOOERS ROAD WETLAND DELINEATION  
TAX MAP 72, LOT 13-1  
NOTTINGHAM, NEW HAMPSHIRE**

**NATURAL RESOURCE OVERLAY**

PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com	PREPARED FOR: JONES & BEACH ENGINEERS, INC.
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PROJ MGR: PM	REVIEWED BY: REV	CHECKED BY: CKD	<b>1</b>
DESIGNED BY: DES	DRAWN BY: DRN	SCALE: 1" = 300 FEET	
DATE: 08/11/2022	PROJECT NO: 04.0191303.00	REVISION NO.	

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Air





## Appendix A – Limitations



## **USE OF REPORT**

1. GZA GeoEnvironmental, Inc. (GZA) has prepared this report on behalf of, and for the exclusive use of Jones & Beach Engineers, Inc. ("Client") for the stated purpose(s) and location(s) identified in the report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's risk, and without any liability to GZA.

## **STANDARD OF CARE**

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the data gathered and observations made during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

## **LIMITS TO OBSERVATIONS**

4. Natural resource characteristics are inherently variable. Biological community composition and diversity can be affected by seasonal, annual or anthropogenic influences. In addition, soil conditions are reflective of subsurface geologic materials, the composition and distribution of which vary spatially.
5. The observations described in this report were made on the dates referenced and under the conditions stated therein. Conditions observed and reported by GZA reflect the conditions that could be reasonably observed based upon the visual observations of surface conditions and/or a limited observation of subsurface conditions at the specific time of observation. Such conditions are subject to environmental and circumstantial alteration and may not reflect conditions observable at another time.
6. The conclusions and recommendations contained in this report are based upon the data obtained from a limited number of surveys performed during the course of our work on the site, as described in the Report. There may be variations between these surveys and other past or future surveys due to inherent environmental and circumstantial variability.

## **RELIANCE ON INFORMATION FROM OTHERS**

7. Preparation of this Report may have relied upon information made available by Federal, state and local authorities; and/or work products prepared by other professionals as specified in the report. Unless specifically stated, GZA did not attempt to independently verify the accuracy or completeness of that information.

## **COMPLIANCE WITH REGULATIONS AND CODES**

8. GZA's services were performed to render an opinion on the presence and/or condition of natural resources as described in the Report. Standards used to identify or assess these resources as well as regulatory jurisdiction, if any, are stated in the Report. Standards for identification of jurisdictional resources and regulatory control over them may vary between governmental agencies at Federal, state and local levels and are subject to change over time which may affect the conclusions and findings of this report.



#### **NEW INFORMATION**

9. In the event that the Client or others authorized to use this report obtain information on environmental regulatory compliance issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this work, may modify the conclusions stated in this report.

#### **ADDITIONAL SERVICES**

10. GZA recommends that we be retained to provide further investigation, if necessary, which would allow GZA to (1) observe compliance with the concepts and recommendations contained herein; (2) evaluate whether the manner of implementation creates a potential new finding; and (3) evaluate whether the manner of implementation affects or changes the conditions on which our opinions were made.





## Appendix B - Photo Log

**VERNAL POOL PHOTO LOG**  
**MOOERS ROAD**  
**Nottingham, New Hampshire**  
**Photos Taken: May 27, 2022**



Photograph No. 1: Looking at Vernal Pool 1.



Photograph No. 2: Looking at *Dytiscus* spp. larva in Vernal Pool 1.



**VERNAL POOL PHOTO LOG**  
**MOOERS ROAD**  
**Nottingham, New Hampshire**  
**Photos Taken: May 27, 2022**



Photograph No. 3: Looking at Potential Vernal Pool 2.



Photograph No. 4: Looking at a bullfrog observed in Potential Vernal Pool 2.



VERNAL POOL PHOTO LOG  
MOOERS ROAD  
Nottingham, New Hampshire  
Photos Taken: May 27, 2022



Photograph No. 5: Looking at Vernal Pool 3.



Photograph No. 6: Looking at a spotted salamander egg mass in Vernal Pool 3.



**VERNAL POOL PHOTO LOG  
MOOERS ROAD  
Nottingham, New Hampshire  
Photos Taken: May 27, 2022**



Photograph No. 7: Looking at Vernal Pool 5.



Photograph No. 8: Looking at a spotted salamander egg mass in Vernal Pool 5.



**VERNAL POOL PHOTO LOG**  
**MOOERS ROAD**  
**Nottingham, New Hampshire**  
**Photos Taken: May 27, 2022**



Photograph No. 9: Looking at Vernal Pool 6.



Photograph No. 10: Looking at a spotted salamander egg mass in Vernal Pool 6.





**Appendix C – Vernal Pool Data Sheets**



## New Hampshire Vernal Pool Documentation Form

**Purpose:** This form is to provide a way to collect appropriate information necessary to document the presence of a vernal pool or potential vernal pool in New Hampshire. It is also appropriate to use this form to document the *absence* of certain physical and, especially, biological characteristics to describe a pool or depression within a wetland that may not meet the definition of a vernal pool.

### I. Observer Contact information

Observer name	Tracy Tarr
Observer phone #:	603-235-6992
Observer email	tracy.tarr@gza.com
Observer Mailing address:	5 Commerce Park N, Bedford, NH 03110

### II. Location and Owner Identification

Town: Nottingham	
Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude: 43.069716 N  Longitude: 71.163896 W
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land?      Yes / <input checked="" type="radio"/> No	Landowner permission obtained? <input checked="" type="radio"/> Yes / No
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

Vernal Pool Site Name: VP1

#### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

### III. Survey Information

Date of survey:	5/24/22	Visit # (for season):	1   2   3   4   ___
Survey start time:	11: 20 <input checked="" type="radio"/> am / pm	Survey end time:	11: 40 <input checked="" type="radio"/> am / pm
Air temperature (F):	High 50s		

**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

**IV. Vernal Pool Description**

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

**Pool characteristics**

**Vernal pool type (choose most appropriate description)**

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

**Origin of pool (select one)**

- Unknown
- Natural depression
- Natural, but altered
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

**How long does the vernal pool hold water? (Hydroperiod)**

- Seasonal (drying out entirely in most years) Assumed
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water)
- Unknown

**Maximum water depth on survey date**

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep) 6 inches on average
- 1 - 2 feet (knee deep)
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date? **Y / N**

**Overstory/Shading of vernal pool depression**

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%)
- Less shaded by trees (< 50%)
- Shaded only by vegetation in the pool (such as shrubs)



**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs		30%	
Emergent vegetation (Grasses, sedges, rushes, cattails)		-	
Submergent vegetation		-	

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment?  
(Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter  
 Sand/gravel  
 Muck  
 Bedrock  
 Other: \_\_\_\_\_

**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping  
 Ditching/draining  
 Ruts from wheeled vehicles  
 Runoff /siltation from human sources  
 Other: Adjacent to field/barbed wire  
 None

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, >50%)  
 Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%)  
 Wetlands (< 10%, 10-50%, > 50%)  
 Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)  
 Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%)  
 Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)  
 Paved Roads/driveways (< 10%, 10-50%, > 50%)  
 Unpaved roads/driveways (< 10%, 10-50%, > 50%)

Describe any disturbance observed in the 100 foot area around the pool: \_\_\_\_\_

**V. Survey for vernal pool fauna (amphibians and macroinvertebrates)**

NOTE: Provide photographs when possible.

**Species information - Primary Vernal Pool Indicators**

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog							
Spotted salamander			NA				
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Green frog	3						

Was entire pool surveyed for egg masses? Yes/ No If Yes, what percent of the pool? \_\_\_\_\_

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

**Sampling methods used during your survey (check all that apply):**

- Visual search  
 Audible detection (Recorded: : Yes / **No**)  
 Dip net  
 Trapping  
 None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes / **No**Were **fish** observed in the pool? Yes / **No**

### Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

The families or groups listed in the following table are among those **secondary vernal pool indicators** under the New Hampshire wetlands rules (Env-Wt 100). Additional species (family or groups) may qualify as secondary vernal pool indicators, hence blank spaces are provided to enter other species you observe.

Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type		
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae	X	X
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Haliplidae		
	Water scavenger beetle	Hydrophilidae	X	
Dragonfly larvae or exuviae	Unknown type	Unknown type		
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damselfly larvae or exuviae	Unknown type	Unknown type		
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae	X	
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
Other*:				

Completed datasheets can be submitted to NH Wildlife Sightings at: <http://nhwildlifesightings.unh.edu/> or mailed to NH Fish & Game Department, Nongame & Endangered Wildlife Program, 11 Hazen Drive, Concord NH 03301.



## New Hampshire Vernal Pool Documentation Form

**Purpose:** This form is to provide a way to collect appropriate information necessary to document the presence of a vernal pool or potential vernal pool in New Hampshire. It is also appropriate to use this form to document the *absence* of certain physical and, especially, biological characteristics to describe a pool or depression within a wetland that may not meet the definition of a vernal pool.

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Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude: Wetland flags B14-B26  Longitude:
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land? Yes / <u>No</u>	Landowner permission obtained? <u>Yes</u> / No
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

Vernal Pool Site Name: PVP2  
 Not confirmed with secondary indicators

#### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

### III. Survey Information

Date of survey:	5/24/22	Visit # (for season):	<u>1</u> 2 3 4 ___
Survey start time:	11: 45 <u>am</u> /pm	Survey end time:	12: 50 am / <u>pm</u>
Air temperature (F):	Low 60s		



**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

**IV. Vernal Pool Description**

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

**Pool characteristics**

**Vernal pool type (choose most appropriate description)**

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

**Origin of pool (select one)**

- Unknown
- Natural depression
- Natural, but altered
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

**How long does the vernal pool hold water? (Hydroperiod)**

- Seasonal (drying out entirely in most years) Assumed
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water)
- Unknown

**Maximum water depth on survey date**

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep)
- 1 - 2 feet (knee deep)
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date? **Y/N**

**Overstory/Shading of vernal pool depression**

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%)
- Less shaded by trees (< 50%)
- Shaded only by vegetation in the pool (such as shrubs)

**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs		-	
Emergent vegetation (Grasses, sedges, rushes, cattails)		-	
Submergent vegetation		-	

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment?  
(Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter  
 Sand/gravel  
 Muck  
 Bedrock  
 Other: \_\_\_\_\_

**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping  
 Ditching/draining  
 Ruts from wheeled vehicles  
 Runoff /siltation from human sources  
 Other: \_\_\_\_\_  
 None Adjacent to field

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, > 50%) ~50%  
 Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%) ~50%  
 Wetlands (< 10%, 10-50%, > 50%)  
 Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)  
 Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%)  
 Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)  
 Paved Roads/driveways (< 10%, 10-50%, > 50%)  
 Unpaved roads/driveways (< 10%, 10-50%, > 50%)

Describe any disturbance observed in the 100 foot area around the pool: Existing agriculture field



**V. Survey for vernal pool fauna (amphibians and macroinvertebrates)**

NOTE: Provide photographs when possible.

**Species information - Primary Vernal Pool Indicators**

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog							
Spotted salamander			NA				
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Green frog	many						
Bull Frog	1						

Was entire pool surveyed for egg masses?  Yes  No If Yes, what percent of the pool? 70%

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

**Sampling methods used during your survey (check all that apply):**

- Visual search  
 Audible detection (Recorded: : Yes  No )  
 Dip net  
 Trapping  
 None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes  No Were **fish** observed in the pool? Yes  No 

## Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

The families or groups listed in the following table are among those **secondary vernal pool indicators** under the New Hampshire wetlands rules (Env-Wt 100). Additional species (family or groups) may qualify as secondary vernal pool indicators, hence blank spaces are provided to enter other species you observe.

Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type		
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae	X	
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Haliplidae		
	Water scavenger beetle	Hydrophilidae		
Dragonfly larvae or exuviae	Unknown type	Unknown type		
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damselfly larvae or exuviae	Unknown type	Unknown type		
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae		
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
Other*:				

Completed datasheets can be submitted to NH Wildlife Sightings at: <http://nhwildlifesightings.unh.edu/> or mailed to NH Fish & Game Department, Nongame & Endangered Wildlife Program, 11 Hazen Drive, Concord NH 03301.



## New Hampshire Vernal Pool Documentation Form

**Purpose:** This form is to provide a way to collect appropriate information necessary to document the presence of a vernal pool or potential vernal pool in New Hampshire. It is also appropriate to use this form to document the *absence* of certain physical and, especially, biological characteristics to describe a pool or depression within a wetland that may not meet the definition of a vernal pool.

### I. Observer Contact information

Observer name	Sydney Wicklund
Observer phone #:	603-247-8742
Observer email	sydney.wicklund@gza.com
Observer Mailing address:	5 Commerce Park N, Bedford, NH 03110

### II. Location and Owner Identification

Town: Nottingham	
Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude: 43.070741N  Longitude: 71.164874W
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land? Yes / No	Landowner permission obtained? <input checked="" type="radio"/> Yes / No
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

Vernal Pool Site Name: VP3

#### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

### III. Survey Information

Date of survey:	5/27/22	Visit # (for season):	<input checked="" type="radio"/> 1   2   3   4   ___
Survey start time:	10:00 <input checked="" type="radio"/> am / pm	Survey end time:	10:00 <input checked="" type="radio"/> am / pm
Air temperature (F):	70s		



**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

**IV. Vernal Pool Description**

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

**Pool characteristics**

**Vernal pool type (choose most appropriate description)**

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

**Origin of pool (select one)**

- Unknown
- Natural depression
- Natural, but altered
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

**How long does the vernal pool hold water? (Hydroperiod)**

- Seasonal (drying out entirely in most years)
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water) Assumed
- Unknown

**Maximum water depth on survey date**

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep)
- 1 - 2 feet (knee deep) Center
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date? **Y** /  **N**

**Overstory/Shading of vernal pool depression**

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%) ~75%
- Less shaded by trees (< 50%) ~10%
- Shaded only by vegetation in the pool (such as shrubs)

**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs	10%		
Emergent vegetation (Grasses, sedges, rushes, cattails)		30%	
Submergent vegetation		20%	

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment?  
(Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter Hummocks present  
 Sand/gravel  
 Muck  
 Bedrock  
 Other: \_\_\_\_\_

**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping  
 Ditching/draining  
 Ruts from wheeled vehicles  
 Runoff /siltation from human sources  
 Other: \_\_\_\_\_  
 None

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, > 50%) 40%  
 Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%)  
 Wetlands (< 10%, 10-50%, > 50%) 10%  
 Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)  
 Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%) ~10%  
 Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)  
 Paved Roads/driveways (< 10%, 10-50%, > 50%)  
 Unpaved roads/driveways (< 10%, 10-50%, > 50%)

Describe any disturbance observed in the 100 foot area around the pool: Field adjacent

### V. Survey for vernal pool fauna (amphibians and macroinvertebrates)

NOTE: Provide photographs when possible.

#### Species information - Primary Vernal Pool Indicators

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog							
Spotted salamander			NA	1			
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)

Was entire pool surveyed for egg masses?  Yes  No If Yes, what percent of the pool? \_\_\_\_\_

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

#### Sampling methods used during your survey (check all that apply):

- Visual search
- Audible detection (Recorded: : Yes  No )
- Dip net
- Trapping
- None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes  No

Were **fish** observed in the pool? Yes  No





### Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

The families or groups listed in the following table are among those **secondary vernal pool indicators** under the New Hampshire wetlands rules (Env-Wt 100). Additional species (family or groups) may qualify as secondary vernal pool indicators, hence blank spaces are provided to enter other species you observe.

Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type		
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae		
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Haliplidae		
	Water scavenger beetle	Hydrophilidae		
Dragonfly larvae or exuviae	Unknown type	Unknown type	X	
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damselfly larvae or exuviae	Unknown type	Unknown type	X	
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae		
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
Other*:				

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# New Hampshire Vernal Pool Documentation Form

**Purpose:** This form is to provide a way to collect appropriate information necessary to document the presence of a vernal pool or potential vernal pool in New Hampshire. It is also appropriate to use this form to document the *absence* of certain physical and, especially, biological characteristics to describe a pool or depression within a wetland that may not meet the definition of a vernal pool.

## I. Observer Contact information

<b>Observer name</b>	Tracy Tarr
<b>Observer phone #:</b>	603-235-6992
<b>Observer email</b>	tracy.tarr@gza.com
<b>Observer Mailing address:</b>	5 Commerce Park N, Bedford, NH 03110

## II. Location and Owner Identification

Town: Nottingham	
Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude: Wetland flag D15  Longitude:
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land? Yes / <input checked="" type="radio"/> No	Landowner permission obtained? <input checked="" type="radio"/> Yes / No
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

**Vernal Pool Site Name:** Area 4  
Almost dry, not a Vernal Pool

### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

## III. Survey Information

<b>Date of survey:</b>	5/24/22	<b>Visit # (for season):</b>	<input checked="" type="radio"/> 1   2   3   4   ___
<b>Survey start time:</b>	1 : 35   am / <input checked="" type="radio"/> pm	<b>Survey end time:</b>	1 : 45   am / <input checked="" type="radio"/> pm
<b>Air temperature (F):</b>	Low 60s		

**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

#### IV. Vernal Pool Description

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

##### Pool characteristics

##### Vernal pool type (choose most appropriate description)

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

##### Origin of pool (select one)

- Unknown
- Natural depression
- Natural, but altered
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

##### How long does the vernal pool hold water? (Hydroperiod)

- Seasonal (drying out entirely in most years)
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water)
- Unknown

##### Maximum water depth on survey date

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep) 6 inches on average
- 1 - 2 feet (knee deep)
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date? Y/ N

##### Overstory/Shading of vernal pool depression

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%)
- Less shaded by trees (< 50%)
- Shaded only by vegetation in the pool (such as shrubs)



**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs		15%	
Emergent vegetation (Grasses, sedges, rushes, cattails)	-		
Submergent vegetation	-		

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment?  
(Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter  
 Sand/gravel  
 Muck  
 Bedrock  
 Other: \_\_\_\_\_

**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping  
 Ditching/draining  
 Ruts from wheeled vehicles  
 Runoff /siltation from human sources  
 Other: Adjacent to gravel road  
 None

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, >50%)  
 Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%)  
 Wetlands (< 10%, 10-50%, > 50%)  
 Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)  
 Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%)  
 Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)  
 Paved Roads/driveways (< 10%, 10-50%, > 50%)  
 Unpaved roads/driveways (< 10%, 10-50%, > 50%)

Describe any disturbance observed in the 100 foot area around the pool: \_\_\_\_\_

### V. Survey for vernal pool fauna (amphibians and macroinvertebrates)

NOTE: Provide photographs when possible.

#### Species information - Primary Vernal Pool Indicators

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog							
Spotted salamander			NA				
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)

Was entire pool surveyed for egg masses? Yes/ No If Yes, what percent of the pool? \_\_\_\_\_

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

#### Sampling methods used during your survey (check all that apply):

- Visual search
- Audible detection (Recorded: : Yes / **No**)
- Dip net
- Trapping
- None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes / **No**

Were **fish** observed in the pool? Yes / **No**



## Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

The families or groups listed in the following table are among those **secondary vernal pool indicators** under the New Hampshire wetlands rules (Env-Wt 100). Additional species (family or groups) may qualify as secondary vernal pool indicators, hence blank spaces are provided to enter other species you observe.

Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type		
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae	X	
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Haliplidae		
	Water scavenger beetle	Hydrophilidae		
Dragonfly larvae or exuviae	Unknown type	Unknown type		
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damsely larvae or exuviae	Unknown type	Unknown type		
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae		
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
Other*:				

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# New Hampshire Vernal Pool Documentation Form

**Purpose:** This form is to provide a way to collect appropriate information necessary to document the presence of a vernal pool or potential vernal pool in New Hampshire. It is also appropriate to use this form to document the *absence* of certain physical and, especially, biological characteristics to describe a pool or depression within a wetland that may not meet the definition of a vernal pool.

## I. Observer Contact information

<b>Observer name</b>	Tracy Tarr
<b>Observer phone #:</b>	603-235-6992
<b>Observer email</b>	tracy.tarr@gza.com
<b>Observer Mailing address:</b>	5 Commerce Park N, Bedford, NH 03110

## II. Location and Owner Identification

Town: Nottingham	
Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude: Wetland flag G5  Longitude:
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land? Yes / No	Landowner permission obtained? <u>Yes</u> / No
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

Vernal Pool Site Name: VP5

### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

## III. Survey Information

<b>Date of survey:</b>	5/24/22	<b>Visit # (for season):</b>	<u>1</u> 2 3 4 ___
<b>Survey start time:</b>	1 : 50 am <u>(pm)</u>	<b>Survey end time:</b>	2 : 20 am <u>(pm)</u>
<b>Air temperature (F):</b>	Low 60s		

**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

**IV. Vernal Pool Description**

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

**Pool characteristics**

**Vernal pool type (choose most appropriate description)**

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

**Origin of pool (select one)**

- Unknown
- Natural depression
- Natural, but altered
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

**How long does the vernal pool hold water? (Hydroperiod)**

- Seasonal (drying out entirely in most years)
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water)
- Unknown

**Maximum water depth on survey date**

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep)
- 1 - 2 feet (knee deep) Center
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date? **Y** /  **N**

**Overstory/Shading of vernal pool depression**

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%) ~75%
- Less shaded by trees (< 50%)
- Shaded only by vegetation in the pool (such as shrubs)

**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs		X	
Emergent vegetation (Grasses, sedges, rushes, cattails)			
Submergent vegetation			

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment? (Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter Hummocks present
- Sand/gravel
- Muck
- Bedrock
- Other: \_\_\_\_\_



**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping
- Ditching/draining
- Ruts from wheeled vehicles
- Runoff /siltation from human sources
- Other: \_\_\_\_\_
- None

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, >50%)
- Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%)
- Wetlands (< 10%, 10-50%, > 50%)
- Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)
- Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%) ~10%
- Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)
- Paved Roads/driveways (< 10%, 10-50%, > 50%)
- Unpaved roads/driveways (< 10%, 10-50%, > 50%)

Describe any disturbance observed in the 100 foot area around the pool: Yard adjacent



### V. Survey for vernal pool fauna (amphibians and macroinvertebrates)

NOTE: Provide photographs when possible.

#### Species information - Primary Vernal Pool Indicators

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog							
Spotted salamander			NA	## II			
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Green frog	X						

Was entire pool surveyed for egg masses? Yes  No  If Yes, what percent of the pool? ~35%

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

#### Sampling methods used during your survey (check all that apply):

- Visual search
- Audible detection (Recorded: : Yes  No )
- Dip net
- Trapping
- None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes  No

Were **fish** observed in the pool? Yes  No



### Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

The families or groups listed in the following table are among those **secondary vernal pool indicators** under the New Hampshire wetlands rules (Env-Wt 100). Additional species (family or groups) may qualify as secondary vernal pool indicators, hence blank spaces are provided to enter other species you observe.

Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type		
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae	X (adult and larval)	
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Halipidae		
	Water scavenger beetle	Hydrophilidae		
Dragonfly larvae or exuviae	Unknown type	Unknown type		
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damsel fly larvae or exuviae	Unknown type	Unknown type		
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae		
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
Other*:				

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<b>Observer name</b>	Tracy Tarr
<b>Observer phone #:</b>	603-235-6992
<b>Observer email</b>	tracy.tarr@gza.com
<b>Observer Mailing address:</b>	5 Commerce Park N, Bedford, NH 03110

### II. Location and Owner Identification

Town: Nottingham	
Property name (if applicable): Mooers Road	
Location Description/ Property street address: Adjacent to 18 Mooers Road	
<b>Vernal Pool Coordinates</b> <i>Coordinates obtained by GPS or other means. Report in degrees minutes seconds or decimal degrees: Latitude 43.2164 Longitude -71.5192. Datum: Use NAD83 or WGS84 for all coordinates</i>	Latitude:  Longitude:
<b>Source of coordinates:</b> (circle one): GPS unit, Google Maps/Google Earth, Topo map, other	Tax map and lot # (if known): Tax Map 72, Lot 13-1
Is observation on public land?      Yes <input type="radio"/> No <input checked="" type="radio"/>	Landowner permission obtained? <input checked="" type="radio"/> Yes / No <input type="radio"/>
Landowner name (if known)	James and Linda Rosborrgh
Landowner address (if different than property address)	
Landowner phone or email	

**Note: Provide a map that shows property and location of vernal pool (tax map/ USGS)**

Vernal Pool Site Name: VP6

#### Project affiliation

- None  
 Harris Center/AVEO  
 Town \_\_\_\_\_  
 Consultant  
 Other \_\_\_\_\_

### III. Survey Information

<b>Date of survey:</b>	5/24/22	<b>Visit # (for season):</b>	<input checked="" type="radio"/> 1    2    3    4    ___
<b>Survey start time:</b>	2 :35      am <input checked="" type="radio"/> pm	<b>Survey end time:</b>	2 : 50      am <input checked="" type="radio"/> pm
<b>Air temperature (F):</b>	60s		

**Weather/Other Comments:** provide any information about precipitation, cloud cover, wind, humidity, ice cover, etc here:

**IV. Vernal Pool Description**

**Photos:** 1-3 photographs of vernal pool taken and provided with datasheet  Yes / No

**Pool characteristics**

**Vernal pool type (choose most appropriate description)**

- Upland-isolated pool (not associated with a larger wetland)
- Wetland complex (pool within or associated with a larger wetland habitat, such as red maple swamp, marsh pond edge.
- Floodplain pool

**Origin of pool (select one)**

- Unknown
- Natural depression
- Natural, but altered Culvert in adjacent road
- Small pond / constructed pond
- Quarry/sand pit excavation
- Ditch along road or rut from vehicle
- Created wetland/ pool (such as for wetland mitigation purposes)
- Other: \_\_\_\_\_

**Pool size (dimensions):** \_\_\_\_\_ feet X \_\_\_\_\_ feet (Area of open water in the pool depression )

*If round, measure diameter; if long and narrow, provide length and width dimensions.*

(check one):  Measured  Paced  Estimated  Other: \_\_\_\_\_

**How long does the vernal pool hold water? (Hydroperiod)**

- Seasonal (drying out entirely in most years)
- Semi-permanent (drying partially in most years)
- Permanent (Typically maintains water)
- Unknown

**Maximum water depth on survey date**

- < 6 inches (ankle deep)
- 6 inches – 1 foot (shin deep)
- 1 - 2 feet (knee deep) Center
- 2 - 3 feet (hip deep)
- 3 - 4 feet (chest deep)
- > 4 feet

**Pool Outlet:** Did you observe water flowing out of the pool on this date?  Y  N Culvert present in road

**Overstory/Shading of vernal pool depression**

*(Overstory is trees, shrubs, and associated limbs and leaves that block sunlight from penetrating the pool surface)*

- Mostly shaded by trees (> 50%) ~60%
- Less shaded by trees (< 50%)
- Shaded only by vegetation in the pool (such as shrubs)



**Vegetation in Pool (vernal pool depression)**

Check (X) **Vegetation type and proportion of vegetation in the pool** (percent coverage) that can provide egg attachment or offer concealment to aquatic or developing larvae.

Vegetation type	Percent coverage of pool by vegetation in the pool		
	<10%	10-50%	>50%
Shrubs		15%	
Emergent vegetation (Grasses, sedges, rushes, cattails)		5%	
Submergent vegetation			

Are **dead branches and downed woody material** (branches/twigs) available in pool for egg attachment?  
(Select one category)  None  1 - 10  greater than 10

**Pool substrate** (select all that apply)

- Leaf litter Hummocks present  
 Sand/gravel  
 Muck  
 Bedrock  
 Other: \_\_\_\_\_

**Disturbance to vernal pool observed (select all that apply)**

Observe any disturbance to the pool (direct or indirect by siltation, for example)

- Dumping  
 Ditching/draining  
 Ruts from wheeled vehicles  
 Runoff /siltation from human sources  
 Other: \_\_\_\_\_  
 None

**Surrounding habitat** (within 100 feet of the pool)

Check habitat type and select/circle appropriate percentage

- Forest (< 10%, 10-50%, > 50%) ~30%  
 Open (shrublands, agriculture, grassland, etc.) (< 10%, 10-50%, > 50%)  
 Wetlands (< 10%, 10-50%, > 50%)  
 Open water (lakes/ponds, rivers/streams) (< 10%, 10-50%, > 50%)  
 Residential (lawn, little amount of pavement/structures) (< 10%, 10-50%, > 50%) ~30%  
 Industrial/Urban (mostly pavement and structures) (< 10%, 10-50%, > 50%)  
 Paved Roads/driveways (< 10%, 10-50%, > 50%)  
 Unpaved roads/driveways (< 10%, 10-50%, > 50%) ~40%

Describe any disturbance observed in the 100 foot area around the pool: Gravel road adjacent

### V. Survey for vernal pool fauna (amphibians and macroinvertebrates)

NOTE: Provide photographs when possible.

#### Species information - Primary Vernal Pool Indicators

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Wood frog						observed	
Spotted salamander			NA	1			
Marbled salamander			NA				
Blue spotted/ Jefferson salamander			NA				
Mole salamander (unknown species)			NA				
Fairy shrimp		NA	NA	NA	NA	NA	NA

Record **other amphibian and reptile species** observed (such as spring peepers, etc.):

Species observed	Adults			Egg masses (#)		Tadpoles, Salamander Larvae and Transforming Juveniles	
	Seen #	Courtship/ amplexus (Y/N)	Heard Y/N	Counted)	Estimated	Tadpole/ Larvae estimated	#Transforming juveniles (#)
Green frog	X						

Was entire pool surveyed for egg masses?  Yes  No If Yes, what percent of the pool? \_\_\_\_\_

(If the entire pool was not surveyed, is any part of the pool on an adjacent property? (Y/N)

#### Sampling methods used during your survey (check all that apply):

- Visual search
- Audible detection (Recorded: : Yes  No )
- Dip net
- Trapping
- None (incidental observation)

Were **spermatophores** observed (see photo right) ? Yes  No

Were **fish** observed in the pool? Yes  No



## Secondary vernal pool indicators - Invertebrates

During or after amphibian breeding season, there are other organisms whose presence or remains (larval cases, exuviae, or shells) indicate the presence of a vernal pool. These organisms are considered secondary vernal pool indicators.

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Macroinvertebrate Common name of group	Common name of family members	Macroinvertebrate family	Observed? (X)	Photo?
Caddisfly larvae or cases	Unknown type	Unknown type		
	Northern caddisflies	Limnephilidae		
	Giant case makers	Phryganeidae		
	Tube or trumpet caddisflies	Polycentropodidae		
Clam shrimp or shells	Unknown type	Unknown type	X	
	Clam shrimp	Laevicaudata		
	Clam shrimp	Spinicaudata		
Fingernail clams or shells	Fingernail clams	Sphaeriidae		
Aquatic beetle larvae	Unknown type	Unknown type		
	Diving beetle	Dytiscidae		
	Whirligig beetle	Gyrinidae		
	Crawling water beetle	Haliplidae		
	Water scavenger beetle	Hydrophilidae		
Dragonfly larvae or exuviae	Unknown type	Unknown type		
	Darners	Aeshnidae		
	Skimmers	Libellulidae		
Damselfly larvae or exuviae	Unknown type	Unknown type		
	Narrow-winged damselflies	Coenagrionidae		
	Spread-winged dragonflies	Lestidae		
True fly larvae or pupae	Unknown type	Unknown type		
	Mosquitoes	Culicidae		
	Phantom midges	Chaoboridae		
	Non-biting midges	Chironomidae	X	
Spire-shaped snails or shells	Unknown type	Unknown type		
	Tadpole snails or pouch snails	Physidae		
	Pond snails or limpets	Lymnaeidae		
Flat-spire snails or shells	Wheel snails, orb snail, or ram's horn snails	Planorbidae		
Other*:				
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