June 5, 2008

Email

Northampton Conservation Commission
c/o Office of Planning & Development
City Hall
210 Main Street
Northampton, MA 01060

RE: Vernal Pool Assessment Summary Report [LEC File #: KCI\07-300.01]
Assessor's Map 25C, Parcel 012 & 017
Northern Avenue and View Avenue
Northampton, Massachusetts

Dear Commissioners:

On behalf of the Applicant, Northern Avenue Homes, Inc., LEC Environmental Consultants, Inc., (LEC) is submitting this report to summarize the results of the Vernal Pool Assessment conducted from mid-March through the end of May. To reiterate, a portion of the 5.5± acre project site is slated for development and the Applicant voluntarily retained LEC to conduct a comprehensive Vernal Pool Assessment to determine whether any depressions on-site could meet the criteria for certification as Vernal Pool habitat as described within the *Guidelines for the Certification of Vernal Pool Habitat*, prepared by the Massachusetts Division of Fisheries and Wildlife (dated January 1, 2001). According to the Massachusetts Geographic Information Systems (MassGIS) data layers, no Certified (updated January 2008) or Potential Vernal (updated December 2000) Pools exist on the project site. However, preliminary investigations by Molly Hale, Wildlife Biologist, on August 18, 2007, revealed the presence of fingernail clams (family Sphaeriidae, also known as Pisidiidae) and amphibious snails (from two different families: Lymnaeidae and Planorbidae) within small (dry) depressions scattered throughout the on-site Bordering Vegetated Wetland (BVW) system. Both fingernail clams and amphibious air-breathing snails are documented as facultative vernal pool species. Facultative species are *those vertebrate and invertebrate species that can use vernal pool habitat for all or a portion of their life cycle, but are able to successfully complete their life cycle in other water bodies.*

While Ms. Hale's data verifies that potentially certifiable Vernal Pools exist on-site (Vernal Pool Resource Areas protected under the City of Northampton *Wetlands Protection Ordinance*, Chapter 337), additional data collection was required to determine whether the on-site depressions: 1) held surface waters over 60 consecutive days, as required under the *Ordinance* and defined within 310 CMR 10.04 (Vernal pool habitat) of the *Massachusetts Wetlands Protection Act Regulations*, and 2) are indeed eligible for certification as Vernal Pool habitat and if so, to demarcate the functional limits of the Vernal Pool(s). On March 6, 2008, LEC submitted a *Vernal Pool Assessment Protocol*, which was ultimately approved by the Northampton Conservation Commission at a Public Hearing held on March 13, 2008. Although portions of the site, including the aforementioned depressions, were still frozen and/or covered in snow, the Vernal Pool

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Assessment formally commenced on March 18, 2008. The following provides a description of the methodologies implemented and results of the Assessment.

Methodology

As stated above, the Vernal Pool Assessment formally commenced on March 18, 2008, under partially frozen and/or snow covered conditions (see Photograph #'s 1 and 2). In order to fully document surface water conditions and monitor fluctuating water levels, LEC proposed to establish various: 1) fixed photographic stations and 2) benchmark data points within the scattered depressions contained within the interior of the BVW system (depths to be recorded at each site visit). However, due to the frozen and/or snow covered conditions, LEC was unable to establish the benchmark data points until March 28th. Nevertheless, LEC documented and photographed site conditions during site visits conducted on March 18th, 21st, and 25th. Furthermore, Commissioner Paul Wetzel and Conservation Agent Bruce Young met LEC on-site on March 21st and witnessed the partially frozen/snow-covered site conditions.

On March 28th, LEC met the abutters' representative, Daniel Wells of Hyla Ecological Services, on-site to review the existing site conditions and confirm the Vernal Pool Assessment methodology. Subsequent to the on-site, LEC established all final fixed photographic stations (A-J and at Wetland flag #64) and benchmark data points within five depressions identified to potentially function as Vernal Pool habitat. Orange stick-in flags were utilized to demarcate the highest water levels contiguous with the five depressions (Study Areas 1-5). Throughout the duration of the Assessment, the stick-in flags were moved outward from the center of the depressions to record the highest (maximum) water levels. On Friday, April 4th, LEC met Commissioner Paul Wetzel to confirm the specific data collection methodologies and on Monday, April 7th, Commissioner Wetzel circulated an email to the entire Commission confirming LEC's approach.

In addition to documenting the presence of surface waters, LEC personnel searched the five depressions for any evidence of amphibian breeding activity (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or other signs of obligate vernal pool species (e.g., fairy shrimp [ANOSTRACA: *Eubranchipus* sp.) Obligate vernal pool species are *those vertebrate or invertebrate species that rely on vernal pools for all or a portion of their life cycle and are unable to complete their life cycle without vernal pools.* Furthermore, LEC searched the five depressions for any evidence of facultative vernal pool species, as listed within the *Guidelines for the Certification of Vernal Pool Habitat.*

Throughout the duration of the Assessment, LEC remained in contact with the Natural Heritage and Endangered Species Program (NHESP) and monitored The Vernal Pool Association's message board to document the commencement and progression of amphibian migration/movement activities reported within the region.

From March 18th through April 18th, LEC conducted site evaluations twice a week, totaling 10 site visits. Based on 1) the data collected through April 18th, 2) reported regional amphibian movement activities, and 3) water levels at the time, LEC requested reducing the site evaluations to once a week through June 1st. On April 24th, the Commission approved the reduction in surveying effort. Additionally, LEC reviewed and confirmed the reduction with the abutters' representative, Mr. Wells, who also conducted a secondary site

evaluation in conjunction with LEC on April 18th. In total, LEC conducted sixteen (16) site visits from March 18th through the end of May.

Results

As previously stated, five depressions (Study Areas 1-5) were comprehensively investigated to document fluctuating water levels and determine the presence or absence of potential vernal pool species. A description of each Study Area and corresponding results follows Table 1:

	Study Area (water depths in inches)				
DATE	**#1**	**#2**	**#3**	**#4**	**#5**
March 18	Frozen solid	Frozen solid	Frozen solid	Thin ice	Thin ice
March 21	Frozen solid	Partially frozen	Frozen solid	10±	Thin ice
March 25	Frozen solid	Partially frozen	Partially frozen	10±	Thin ice
March 28	7 (partially frozen)	6	3.5	10.5	10.25
April 1	5	6	3.5	8.5	10
April 4	7	6.5	4	12	11
April 8	4.5	5.5	1	8	10.5
April 11	4.5	5.5	0.25	8.75	9
April 15	4	5	Dry	7	9
April 18	4	5	Dry	7	6.5
April 23	3.5	4	Dry	6.5	4.5
April 30	4.75	5.25	2	7.5	9.5
May 9	3.25	4.5	Dry	6	5.5
May 16	2.5	1	Dry	5.5	Dry
May 22	3	3.5	Dry	5.5	Dry
May 28	Dry	Dry	Dry	4.5	Dry

Table 1. Documented Water Levels.

Study Area #1

Study Area #1 is located in the southwestern corner of the site, between Wetland Flag #70 and the linear stream (ditch), referred to as Millyard Brook, extending parallel to the western property boundary (See Photographs #3). The 1,100± square foot depression maintains a direct hydrologic connection to the linear stream via a small channel and is directly fed by overflow from the stream (Photograph #4). As represented in

Table 1, Study Area #1 remained completely frozen past the March 25th site visit. On March 28th, LEC was able to set the benchmark data point amongst floating slabs of ice (3-4" thick). Throughout the Assessment, water levels fluctuated within Study Area #1 from 2.5 to 7 inches; directly influenced by precipitation and overflow from the adjacent stream channel. On May 16th, LEC observed that water levels had dropped below the channel connecting the depression and the stream and on May 28th, the depression was dry (at the benchmark), aside from a ~ 2' x 2' puddle containing less than an inch of standing water.

Throughout the duration of the Assessment, LEC routinely encountered small fingernail clams (family: Sphaeriidae, also known as Pisidiidae) within Study Area #1. Mosquito larvae (family: Culicidae), water striders (family Gerridae), and one adult predaceous diving beetle (family: Dytiscidae) were also found within Study Area #1. No signs of amphibian activity, breeding (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or otherwise, and/or fairy shrimp were documented in Study Area #1.

Study Area #2

Study Area #2 is located just north of Study Area #1 within the interior of the BVW system (Photograph #5). Throughout the entire forested wetland system, on-site topography gently descends from the BVW boundary westerly towards Millyard Brook, thus dictating surficial drainage patterns. As witnessed during rain events and following spring snow/ice melt, surface waters within the BVW partially drain into Study Area #2, including one established intermittent stream, which flows within a loosely defined stream channel. In addition to the inlet channel, an outlet channel is also located within the northwestern portion of Study Area #2, discharging flow into Millyard Brook. Furthermore, a loose surficial connection, 3-4 feet wide, was observed to connect to Study Area #1. While no flow was ever observed within this connection, surface waters (0-2 inches) persisted over a two week period in late March/early April, before becoming dry. As depicted in Table 1, water levels within the 5,600± square foot depression ranged from 1 to 6.5 inches, before completely drying up, as observed on May 28th.

Throughout the duration of the Assessment, LEC routinely encountered small fingernail clams and amphibious air-breathing snails (families: Lymnaeidae, Physidae, and Planorbidae) within Study Area #2. Mosquito larvae, Daphnia (Class: Branchiopoda "Cladocera"), aquatic oligochaete worms (Order: Oligochaeta), isopods (Order: Isopoda), and water striders were also found within Study Area #2. No signs of amphibian activity, breeding (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or otherwise, and/or fairy shrimp were documented in Study Area #2.

Study Area #3

Study Area #3 is centrally located within the BVW system, just northeast of Study Area #2. This small, ~ 12' x 18' (216± square feet) subtle depression maintains both an inlet and an outlet (See Photograph #6). As represented in Table 1, Study Area #3 was dry for the majority of the Assessment and only contained surface waters immediately following spring snow/ice melt and/or precipitation events.

LEC only encountered small fingernail clams within Study Area #3. No signs of amphibian activity, breeding (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or otherwise, and/or fairy shrimp were documented in Study Area #3.

Study Area #4

Study Area #4 is an ~ 8-foot wide x 20-foot long (160± square feet) inlet depression that extends southeasterly from Millyard Brook along the property boundary to Parcels 012 and 017 (see Photograph #7).). A linear, excavated ditch also extends along the property boundary and connects to the southeastern terminus of the inlet depression, intermittently discharging surface waters collected within the BVW. While Study Area #4 is contiguous with Millyard Brook, the inlet depression does not receive normal continuous flow from the Brook and was therefore chosen to be studied as the inlet depression appeared to contain an adequate water column for potential amphibian development. Throughout the duration of the Assessment, Study Area #4 maintained a water column due to its surficial water connection with Millyard Brook. As depicted in Table 1, water levels fluctuated between 4.5 and 10.5 inches.

LEC routinely encountered small fingernail clams and amphibious air-breathing snails within Study Area #4. Mosquito larvae were also documented. No signs of amphibian activity, breeding (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or otherwise, and/or fairy shrimp were documented in Study Area #4.

Study Area #5

Study Area #5 is located within the northern portion of the site, specifically within the demarcated Isolated Vegetated Wetland, just north of Wetland flag #33. This backwards L-shaped isolated depression (75± square feet) contained up to 11 inches of standing water on April 4th before drying up, as observed on May 16th. From the start of the Assessment through mid-April, this small depression contained a significant amount of algal growth, before water levels began to significantly drop.

Throughout the duration of the Assessment, LEC only encountered one small fingernail clam and several amphibious air-breathing snails (Planorbidae family only) within Study Area #5. No signs of amphibian activity, breeding (e.g., chorusing, mated pairs, egg masses, transforming tadpoles/juveniles, etc.) or otherwise, and/or fairy shrimp were documented in Study Area #5.

Conclusions

Based on the results of the Vernal Pool Assessment, it is LEC's opinion that none of the five depressions studied truly meet the criteria for certification as Vernal Pool habitat as described within the *Guidelines for the Certification of Vernal Pool Habitat*, prepared by the Massachusetts Division of Fisheries and Wildlife (dated January 1, 2001) and should not be considered Presumed Vernal Pools or Vernal Pool Resource Areas as defined under the City of Northampton *Wetlands Protection Ordinance*, Chapter 337. Firstly, no obligate vernal pool species were encountered throughout the duration of the Assessment. No signs of any amphibians, obligate or facultative, were documented on-site, likely a product of the surrounding habitat landscape. Additionally, water levels present within each depression would likely not support successful amphibian larval development.

While facultative species were encountered, primarily fingernail clams and/or air-breathing snails, Study Areas 1, 2, 3, and 5 did not contain surface waters for 60 consecutive days during the spring growing season. Study Area #4 is contiguous with Millyard Brook, thereby retaining water for greater than 60 days as an influx of water from an intermittent stream and therefore should not be considered Vernal Pool habitat. As required

LEC

under the *Ordinance*, rainfall during the Assessment was documented to be at least 75% of the average over the last 20 years in Northampton (see attached). Furthermore, Study Areas #'s 1-3 cannot be considered "confined depressions". As stated above, Study Area #1 is directly connected to and influenced by overflow from Millyard Brook, while Study Area #'s 2 and 3 have both inlets and outlets. And finally, all encountered facultative invertebrate species are commonly found within forested wetland systems containing partially standing water confined to small scattered depressions and/or stream beds. Both fingernail clams and air-breathing snails are able to survive dry periods by burrowing into the mucky organic soils and leaf litter present within all five on-site Study Areas.

Considering that the NHESP administers the official vernal pool certification program, LEC will forward the results of the Vernal Pool Assessment to confirm that the five depressions studied truly do not meet the criteria for certification.

LEC is pleased to provide the Commission with this Vernal Pool Assessment Report. We look forward to conducting an on-site with the Commission and reviewing the results of the Assessment at the June 12, 2008 Public Hearing. Should you have any questions or require additional information, please do not hesitate to contact Brian Madden (bmadden@lecenvironmental.com) at 508-746-9491 or Ann Marton (amarton@lecenvironmental.com) at 781-245-2500.

Sincerely,

LEC Environmental Consultants, Inc.

Brian T. Madden
Wildlife Scientist

Ann M. Marton, President
Director of Ecological Services

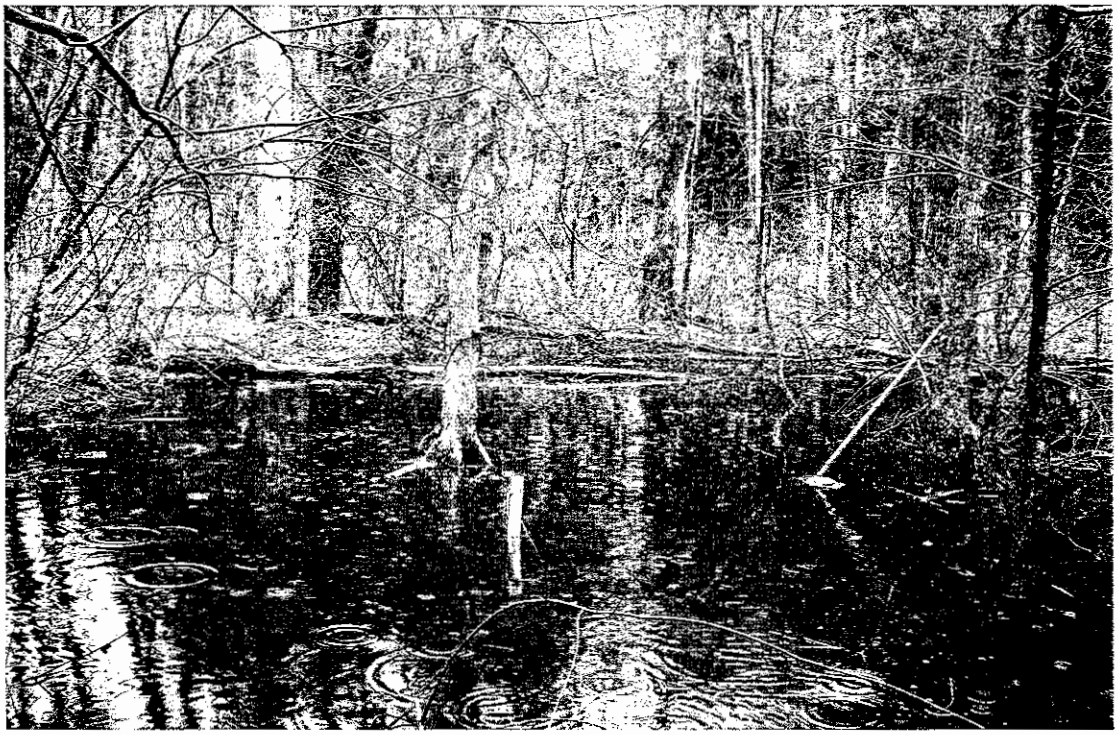
cc: Northern Avenue Homes, Inc.
Daniel Wells, Hyla Ecological Services

Photograph 1: Southerly view of southern portion of forested wetland system; note significant snow/ice cover (March 18, 2008).

Photograph 2: Westerly view of Study Area #1; frozen completely solid (March 18, 2008).

Photograph 3: Southerly view of hydrologic connection between Millyard Brook and Study Area #1 at Photographic Station B (March 28, 2008).

Photograph 4: Westerly view of Study Area #1 at highest recorded water levels; note orange stick-in flags from 4/1/08 site visit (Photo taken from Photographic Station A, April 4, 2008).



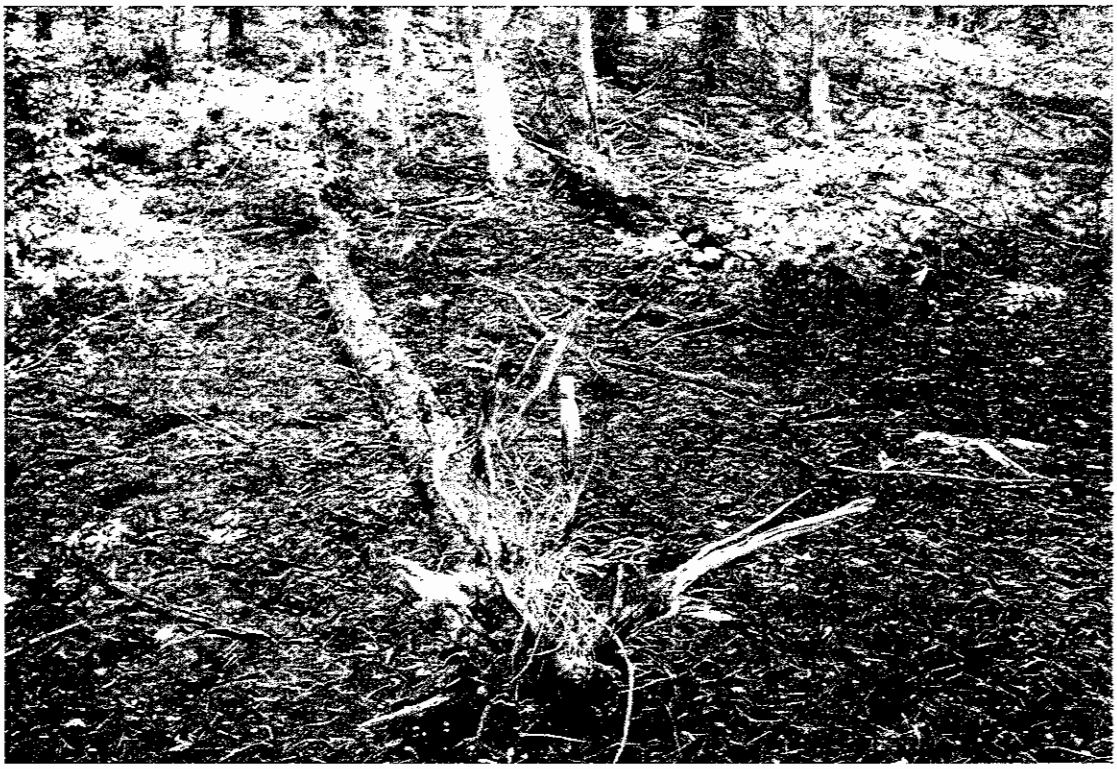
Photograph 5: Easterly view of Study Area #2 at highest recorded water levels (Photo taken from Photographic Station D, April 4, 2008).

Photograph 6: Southeasterly view of Study Area #3 at highest recorded water levels (Photo taken from Photographic Station F, April 4, 2008).

Photograph 7: Northwesterly view of Study Area #4 contiguous with the intermittent stream (Millyard Brook) at highest recorded water levels (Photo taken from Photographic Station G, April 4, 2008).

Photograph 8: Northerly view of Study Area #5 at highest recorded water levels (Photo taken from Photographic Station J, April 4, 2008).

Photograph 9: Westerly view of Study Area #1 (Photo taken from Photographic Station A, May 28, 2008).

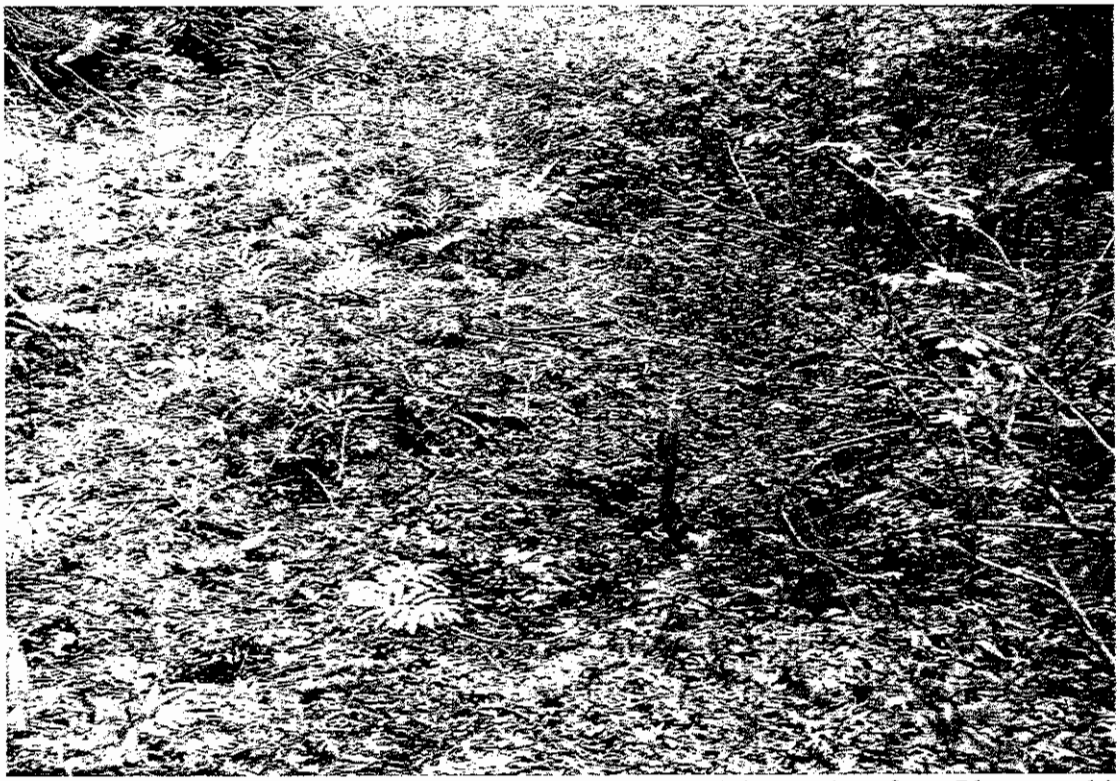


Photograph 10: Southeasterly view of Study Area #1; dry (Photo taken from Photographic Station B, May 28, 2008).

Photograph 11: Easterly view of Study Area #2; dry (Photo taken from Photographic Station D, May 28, 2008).

Photograph 12: Southeasterly view of Study Area #3; dry (Photo taken from Photographic Station F, April 15, 2008).

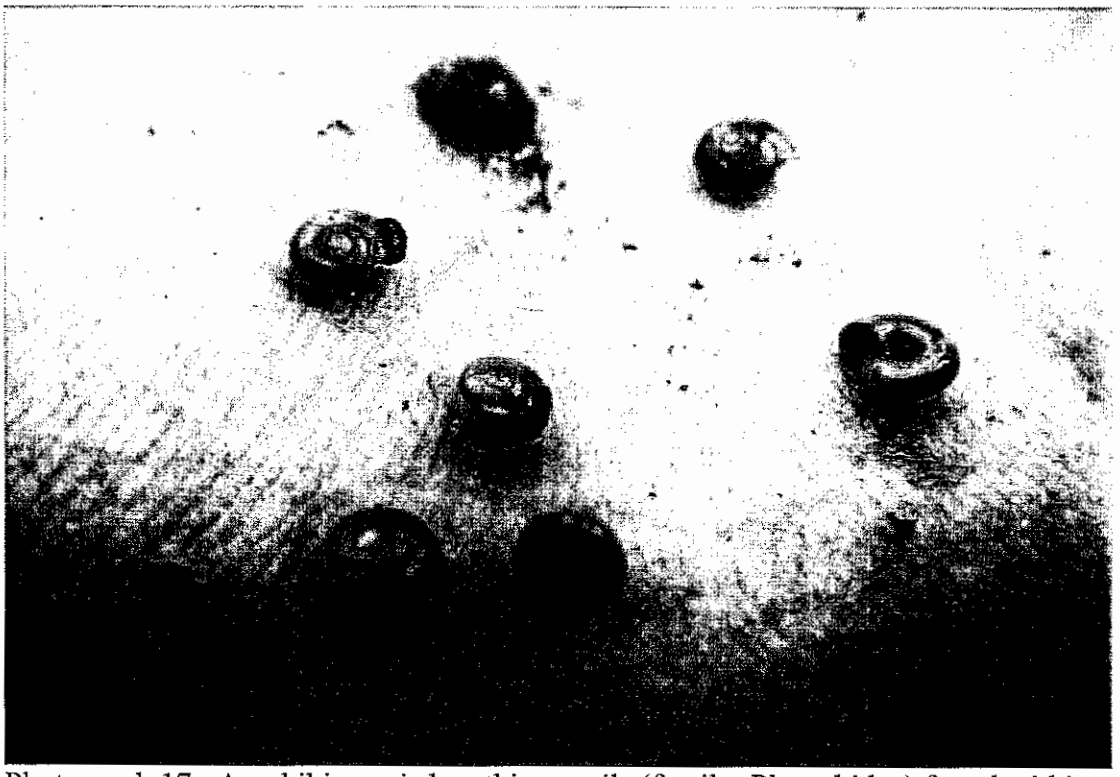
Photograph 13: Northwesterly view of Study Area #4; surface waters still contiguous with Millyard Brook (Photo taken from Photographic Station G, May 28, 2008).



Photograph 14: Northerly view of Study Area #5; dry (Photo taken from Photographic Station J, May 16, 2008).

Photograph 15: Fingernail clams found within Study Area #2 (April 8, 2008).

Photograph 16: Fingernail clams and amphibious air-breathing snails found within Study Area #4 (April 8, 2008).



Photograph 17: Amphibious air-breathing snails (family: Planorbidae) found within Study Area #5 (April 30, 2008).