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Strength. Performance. Passion.

# Acton Quarry Extension

## Amphibian Pool Pilot Project – Pool “G” Update – January 10, 2014

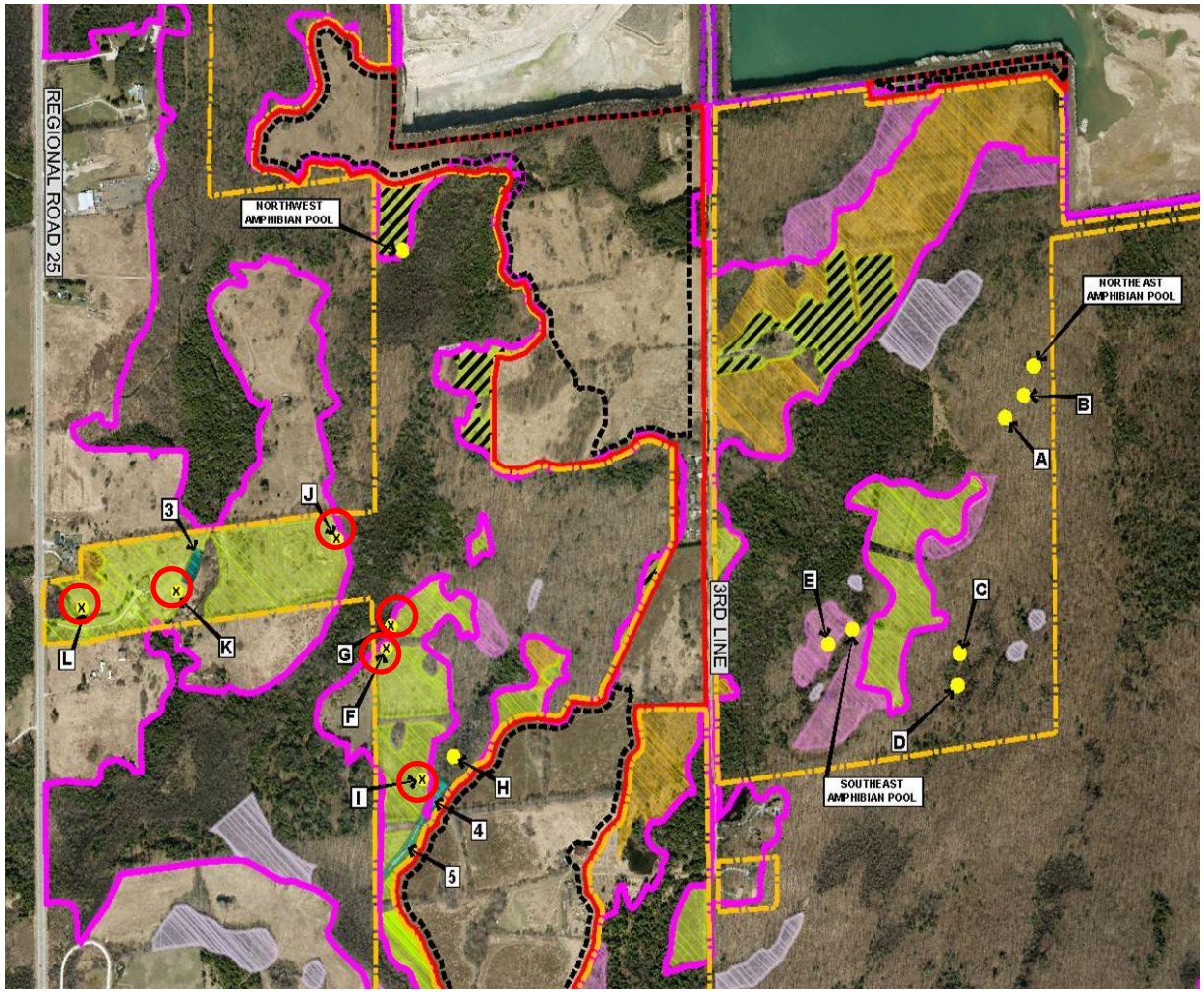
Dufferin has successfully constructed a demonstration amphibian pool (Pool G) on its land at Acton.

## Purpose

- Demonstrate intended approach for construction of proposed amphibian breeding pools/wetlands as part of the Acton Quarry Extension. The proposed Ecological Enhancement plan proposes the construction of approximately six (6) amphibian breeding pools on Dufferin land that will not be licensed.
- Establish early pool construction to study and monitor naturalization process.
- Identify opportunities to optimize pool creation methods based on real-world local experience and collaboration with interested agencies.

# Ecological Enhancement Plan Proposed Breeding Pool Locations

- Extension plans include at least 6 Pools.



# Dufferin obtained approvals from the Ministry of Natural Resources and Conservation Halton to construct an amphibian pool/wetland as a pilot project.

- Pool G was planned and designed to suit the local site conditions and intended ecological features and functions, including amphibian breeding.
- Pool area and vicinity was instrumented to assist in design preparation (e.g. using data from existing monitoring well and piezometers). Pool water is a combination of groundwater and surface water; no pumping is required to maintain seasonal water levels.
- Permit application made to CH in June 2011. Letter of Permission issued by CH on September 1, 2011.
- Letter from MNR issued on October 5, 2011, allowing construction pursuant to Sections 9 and 10 of the *Endangered Species Act*.

# Permit Drawings

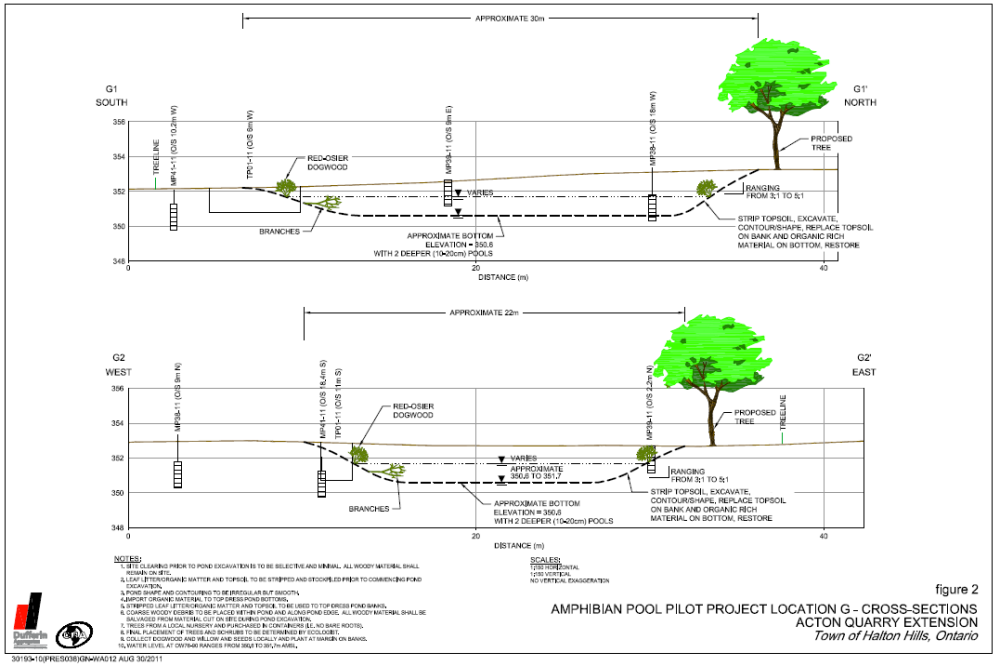



figure 2

AMPHIBIAN POOL PILOT PROJECT LOCATION G - CROSS-SECTIONS
ACTON QUARRY EXTENSION
*Town of Halton Hills, Ontario*

30193-10(PRES038)GN-WA012 AUG 30/2011

- Pond area was investigated with test pits and piezometers were installed to confirm groundwater levels.
- Design drawings were prepared.

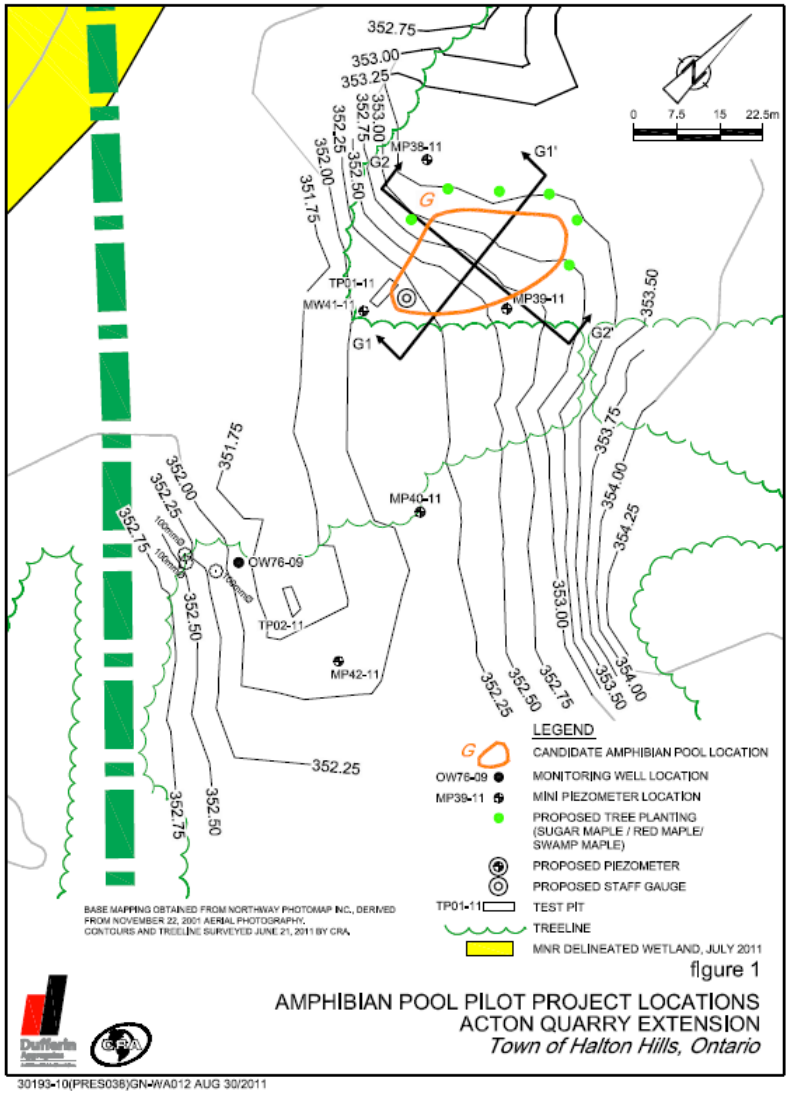



figure 1

AMPHIBIAN POOL PILOT PROJECT LOCATIONS
ACTON QUARRY EXTENSION
*Town of Halton Hills, Ontario*

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# Construction of Amphibian Demonstration Pool ‘G’ commenced in October 2011 and was largely complete by November 2011.

- Photos show views from November 7, 2011, when initial construction, tree-planting and seeding was completed.

- The pool was excavated to a particular depth and graded such that water levels are passively maintained by groundwater and surface water inputs.

# Fall 2011: Native trees and vegetation were planted and habitat constructed to support wetland functions.

- 17 relatively large Sugar Maples were planted (4 to 10 cm in diameter at breast height).
- Upland slopes were seeded with a “park mix” comprising Red Fescue, Rye Grass and Clovers.
- Woody material and rocks were placed in and around Pool G to provide some habitat structure and cover.
- The wetland area was seeded with wetland plant seeds collected from local wetlands (e.g. Beggar’s-ticks, Water-plantain, Sedges, etc).

# Amphibian Demonstration Pool ‘G’ began to green up in spring of 2012.

- Photo taken April 18, 2012.
- As anticipated, water levels fluctuate seasonally.
- Wetland vegetation is gradually becoming established around the pool margins.

- Photo taken May 15, 2012.
- American Toad and Northern Leopard Frog observed in 2012. Tadpoles were observed in the pool, during the first spring/summer season after construction. Toadlets were observed leaving the pool.

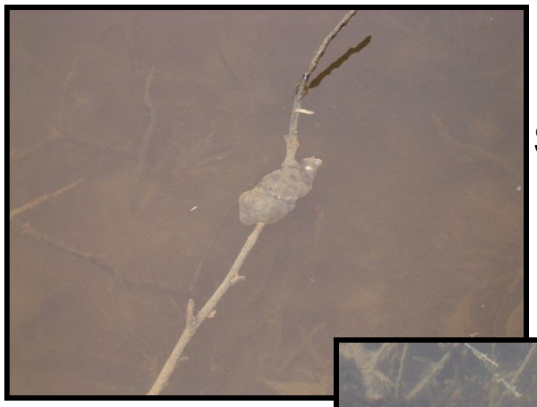
# Amphibian Demonstration Pool ‘G’ began to green up in spring of 2012.

- Photo taken May 15, 2012 showing tadpoles.
- Photo taken Sept. 19, 2012 showing wetland vegetation (e.g. Cattails, Sedges, etc.).

# Spring 2013: Additional activities undertaken to further improve pool conditions and to monitor pool establishment including:

- Top-dressed disturbed upland areas and re-seeded with Park Seed Mixture.
- Sowed wetland seeds including Asters (*Aster lanceolatus, A. novae-angliae*), Blue Vervain (*Verbana hastata*), Narrow-leaved Goldenrod (*Euthamia graminifolia*), and Sedges (*Carex hystericina, C. retrorsa*)
- Transplanted several Eastern Manna Grass (*Glyceria septentrionalis*). This species grows in deeper water and has some floating-leaves which will provide more cover in the pool.
- Placed additional cover objects (e.g. cedar rails) in wetland and on slopes.
- Planted 40 Red-osier Dogwoods at/around high-water mark.
- Planted additional trees (e.g. 15 Eastern White Cedar and 15 Bur Oak) between pool and adjacent woodlands and hedgerow.
- Continued pool monitoring, including:
  - Monthly photo-monitoring;
  - Monthly monitoring of water levels;
  - Frog call surveys, egg mass surveys from perimeter, vegetation surveys, and general wetland/pool reconnaissance.

# Spring 2013: Wetland habitat continues to develop and improve with additional species using Pool ‘G’.



Spotted Salamander Egg Mass

Northern Leopard Frog Egg Mass

American Toad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# 2013 – Wildlife and Plants

Breeding amphibians documented at Pool G in 2012 and/or 2013 include:

- American Toad (adults calling/observed, tadpoles observed, toadlets observed leaving pool);
- Gray Treefrog (adults calling/observed);
- Green Frog (adults calling/observed, tadpoles observed, froglets observed leaving pool);
- Northern Leopard Frog (adults calling/observed, egg masses observed, froglets observed leaving pool); and,
- Spotted Salamander (egg masses observed).

Other wildlife observations:

- Dragonfly species such as the Common Green Darner (*Anax junius*) and Common Whitetail (*Libellula lydia*) were observed laying eggs in Pool G, as of June 2013.
- Signs of White-tailed Deer, Racoon, etc around pool margins.

Since late-fall 2011, 28 native plant species were planted and/or seeded at Pool G and are now well established.

# Closing

- This demonstration project has confirmed that Dufferin's planned approach can be successful at creating new wetland habitat including amphibian/salamander breeding pools, and provides insight for optimization of pool construction in the future.

- Lessons Employed/Learned:

  - Specific instrumentation and investigation allows for accurate design of passively supported water levels (test pits, monitoring wells, piezometers, and staff gauges).

  - Creation of varied side slopes creates a range of habitat opportunities with varying water levels.

  - Top-dressing of ground with soil that does not contain undesirable/invasive plant material will reduce the likelihood of colonization by invasive species.

# In less than 1 year, Pool ‘G’ development exhibited initial wetland pool characteristics and continues to rapidly develop.

Photo taken September 19, 2012

# Pool G – June 14, 2013

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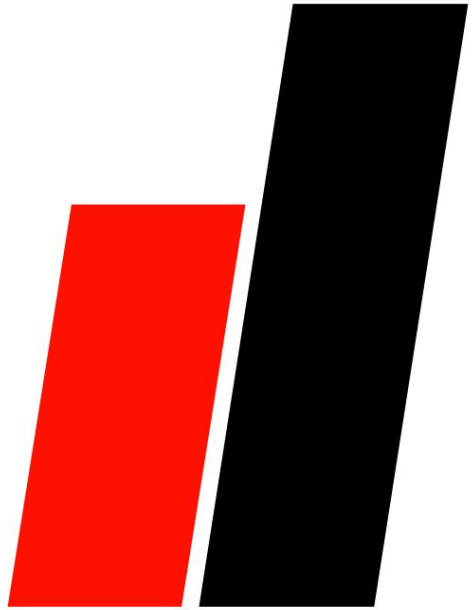

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