Appendix B

Terrestrial and Aquatic Ecology

Species at Risk/Significant Species Screening
#1624 Halton Hills Gateway Secondary Plan

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Birds							
Barn Swallow	*Hirundo rustica*	S4B	THR	T	OBBA/Halton MNRF SAR List	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water. This species forages in grassy fields, cleared ROW's, cottages and farms.[1]	Yes. Barns, sheds and other structures are present on the subject property as well as open areas suitable for foraging. This species was observed foraging over golf course lands on June 1 and June 29, 2015 and in agricultural lands adjacent to Trafalgar Road on May 4, June 1 and June 29 and west of 8th line on June 29, 2015. Based on this breeding evidence, this species is probably breeding on or adjacent to the subject property.
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	T	OBBA/Halton MNRF SAR List	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; an area sensitive species requiring tracts of grassland >50ha. In Ontario, hayfields and pastures are preferred but they are usually absent from grain fields and row crops.[1]	Yes. Small amounts of suitable breeding habitat in the form of cultural meadow (CUM) and hay fields near Trafalgar Road provide marginal habitat for this species. Bobolink were observed within the field east of Trafalgar Road on May 4 and June 1, 2015 but not on subsequent breeding bird surveys indicating that if nesting is occuring it is likely only in very small numbers. Based on this breeding evidence, this species is possibly breeding on the subject property.
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	T	OBBA/Halton MNRF SAR List	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water. Due to land clearing, hollow trees are increasingly rare and chimney swifts are now mainly associated with urban and rural area where there are large concentrations of chimneys for nest sites and communal roosts. In Ontario, this species uses airvents, outshouses, silos, old garages, and outhouses in equal frequency to chimneys.[1]	No. Chimneys or other structures suitable for nesting or roosting Chimney Swift were not identified on the subject property. This species was not observed within the subject property and is not anticipated to be breeding here.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Eastern Meadowlark	*Sturnella magna*	S4B	THR	T	OBBA/Simcoe County SAR List	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10ha in size. This species breeds in Ontario, and favours well concealed grassland and prairie habitats for nesting.[1]	Yes. Small amounts of suitable breeding habitat in the form of cultural meadow (CUM) and hay fields near Trafalgar Road provide marginal habitat for this species. A single Eastern Meadowlark was observed within hay field east of Trafalgar Road on May 4, 2015, which likely represents a migratory individual since this species was not identified on subsequent surveys. Based on the breeding evidence, this species is not likely breeding on the subject property despite some suitable habitat.
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC	OBBA	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks. Breeds in virtually every type of wooded habitat in the east.[1]	Yes. Habitat for this species is found on the subject property within the Halton Regional Forest and woodlands west of the golf course lands. Three Eastern Wood Pewee were observed within the Cultural Plantation (CUP) on June 29, 2015 as well as a single individual within the Black Walnut Deciduous Forest (CUP1-3) on September 1, 2015. In addition, a sinle individual was observed within the Dry-Fresh Sugar Maple-White Ash Deciduous Forest (FOD5-8) on September 1, 2015. Based on this breeding evidence, this species is probably breeding on the subject property within the Regional Forest.
Least Bittern	*Ixobrychus exilis*	S4B	THR	T	OBBA/Halton MNRF SAR List	Breeds specifically in dense freshwater marshes dominated by tall emergent vegetation such as cattails. The bittern typically requires large marshes (>5ha) with a stable water level as the nests are usually built among dense tall stands of emergent vegetation and within 10cm of open waters.[1]	No. Marshes of sufficient size are not present on the subject property. This species was not observed during field studies in 2015.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	SC	T	OBBA	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.[1]	No. Suitable open woodland habitat is not present within the subject property. Most of the forests have dense canopy cover and are of insufficient size and composition to provide suitable habitat for Red-headed Woodpecker. This species was not observed during field studies and is not anticipated to be breeding on the subject property.
Wood Thrush	*Hylocichla mustelina*	S4B	SC	T	OBBA	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.[1]	No. The woodlands on the subject property are too young and dry to provide suitable habitat for Wood Thrush. This species was not observed during field studies and is not anticipated to be breeding on the subject property.
Mammals							
Little Brown Myotis	*Myotis lucifuga*	S4	END	E	Mammal Atlas	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics andbarns; feeds primarily in wetlands, forest edges.[1]	Yes. Large cavity trees were noted within the Dry-Fresh Sugar Maple-White Ash Deciduous Forest (FOD5-8) west of the golf course on May 4, 2015.
Tri-coloured Bat	*Perimyotis subflavus*	S3?		E	Mammal Atlas	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines or rock crevices.[1]	Yes. Large cavity trees were noted within the Dry-Fresh Sugar Maple-White Ash Deciduous Forest (FOD5-8) west of the golf course on May 4, 2015.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Woodland Vole	*Microtus pinetorum*	S3?	SC	SC	Mammal Atlas	Mature deciduous forest in the Carolinian forest zone, with loose sandy soil and deep humus; grasslands, meadows and orchards with groundcover of duff or grass.[1]	No. Mature deciduous forests with loose sandy soil and deep humus are not present nor are other suitable habitats.
Herpetofauna							
Blanding's Turtle	*Emydoidea blandingii*	S3	THR	T	Halton MNRF SAR List	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps, or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.[1]	No. Suitable wetland habitat is not found on the subject property. Ponds within the golf course lands do not contain sufficient basking logs and do not have surrounding natural habitat. This species was not observed during field studies and is not anticipated to be breeding on the subject property.
Eastern Milksnake	*Lampropeltis triangulum*	S3	SC	SC	Halton MNRF SAR List	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.[1]	No. Potential hibernacula were not observed within the subject property. This species was not observed during reptile area searches and is not likely on the subject property.
Eastern Musk Turtle	*Sternotherus odoratus*	S3	SC	SC	Halton MNRF SAR List	Aquatic, except when laying eggs; shallow slow moving water of lakes, streams, marshes and ponds; hibernate in underwater mud, in banks or in muskrat lodges; eggs are laid in debris or under stumps or fallen logs at waters edge; often share nest sites; sometimes congregate at hibernation sites; not readily observed.[1]	No. Suitable aquatic habitat is not present within the subject property. This species was not observed during field studies and is not anticipated to be breeding on the subject property.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Eastern Ribbonsnake	*Thamnophis sauritus*	S3	SC	SC	Halton MNRF SAR List	Usually found in vegetated areas close to water bodies, such as marshes, swamps, bogs, ponds, and edges of streams.[1]	No. Suitable grassy areas adjacent to water bodies are not present on the subject property.
Five-lined Skink (Carolinian Population)	*Plestiodon fasciatus*	S2	END	END	Halton MNRF SAR List	Moderately dense or open deciduous or mixed woodlands with logs and slash piles; damp spots under logs, leaf litter, or sawdust; open talus slopes, barren rock; sandy beaches of Lake Erie, Lake Ontario; breeds in forest floor litter; lays, protects eggs under rocks, logs; forages in open woodlands, in sandy areas, along shores of lakes, and islands; hibernates under rock piles, in rock crevices, under logs and in stumps.[1]	No. Marginal suitable habitat is found within the forests on the subject property, however, this species was not observed during reptile area searches.
Jefferson Salamander	*Ambystoma jeffersonianum*	S2	END	E	Halton MNRF SAR List	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.[1]	No. Suitable breeding ponds are not found within the subject property. This species was not observed during field studies and is not anticipated to be breeding within the subject property.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Northern Map Turtle	*Graptemys geographica*	S3	SC	SC	Halton MNRF SAR List	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water; home range size is larger for females (about 70ha) than males (about 30ha) and includes hibernation, basking, nesting and feeding areas; aquatic corridors (e.g. stream) are required for movement; not readily observed.[1]	No. Suitable aquatic habitat is not present within the subject property. This species was not observed during field studies and is not anticipated to be breeding on the subject property.
Snapping Turtle	*Chelydra serpentina serpentina*	S3	SC	SC	Halton MNRF SAR List	Permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28ha.[1]	No. Suitable aquatic habitat is not present within the subject property. This species was not observed during field studies and is not anticipated to be breeding on the subject property.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Spiny Softshell	*Apalone spinifera spinifera*	S3	THR	T	Halton MNRF SAR List	Intolerant of pollution; large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation; basks on sandbars, mud flats, grassy beaches, logs or rocks; eggs are laid near water on sandy beaches or gravel banks in areas with sun; requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats.[1]	No. Large bodies of water suitable for this species are not found on the subject property. This species was not observed during field studies and is not anticipated to be breeding on the subject property.
Western Chorus Frog	*Pseudacris triseriata pop. 2*	S3	NAR	T	Ontario Reptile and Amphibian Atlas	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools.[1]	No. Aside from ponds located on the golf course lands, no naturalized ponds or other suitable habitat is found within the subject property. This species was not observed during anuran call surveys.
Insects							
Monarch	*Danaus plexippus*	S2N, S4B	SC	SC	Ontario Butterfly Atlas	Open areas, meadows, agricultural fields with milkweed (*Asclepias* spp.).[3]	Yes. Milkweed was observed throughout the subject property and a single Monarch adult was observed on the golf course lands as well as a caterpillar on milkweed adjacent to the pond. This species is confirmed to be breeding on the subject property.
West Virginia White	*Pieris virginiensis*	S3		SC	Ontario Butterfly Atlas	Moist, deciduous woodlands, with toothwort which is a small, spring-blooming plant of the forest floor.[3]	No. Toothwort was not identified as occuring within the woodlands on the subject property. This species was also not observed during early season butterfly surveys on May 4, 2015.
Plants							
American Chestnut	*Castanea dentata*	S2	END	E	Halton MNRF SAR List	Dry forests, often on well drained slopes).[1]	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.
American Columbo	*Frasera caroliniensis*	S2	END	E	Halton MNRF SAR List	Dry to moist deciduous forests with oak, hickory or sassafras. Also forest openings.[1]	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.

Common Name	Scientific Name	S-Rank	COSSARO	COSEWIC	Source	Habitat	Habitat Present on the Subject Property?
Broad Beech Fern	*Phegopteris hexagonoptera*	S3	SC	SC	Halton MNRF SAR List	Rich, moist soil in mature deciduous forests.[1]	No. Suitable moist forest habitat is not present on the subject property. This species was not observed during detailed ELC and vegetation surveys in 2015.
Carey's Sedge	*Carex careyana*	S2			NHIC	Mesic to dry-mesic hardwood forests, floodplain woods.	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.
Eastern Flowering Dogwood	*Cornus florida*	S2?	END	E	Halton MNRF SAR List	Woodland borders and sunny areas within forests.[1]	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.
Hart's-tongue Fern	*Asplenium scolopendrium var. americanum*	S3	SC	SC	Halton MNRF SAR List	Shaded calcareous rock (limestone and dolostone).[1]	No. Limestone and dolostone exposed bedrock is not found on the subject property. This species was not observed on the subject property during detailed ELC and vegetation surveys in 2015.
Hoary Mountain-mint	*Pycnanthemum incanum var. incanum*	S1	END	E	Halton MNRF SAR List	Dry woodlands in partial shade of oaks and in openings.[1]	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.
Red Mulberry	*Morus rubra*	S2	END	E	Halton MNRF SAR List	Moist woods and wooded river valleys.[1]	Yes. Suitable forested habitat is present on the subject property, however, this species was not observed during detailed ELC and vegetation surveys in 2015.
Spiked Blazing Star	*Liatris spicata*	S3	THR	T	Halton MNRF SAR List	Prairies, savannahs and open sandy woods, occasionally adventive.[1]	No. Open sandy woods and other suitable habitats are not found on the subject property. This species was not observed during detailed ELC and vegetation surveys in 2015.

[1]OMNR 2000, [2]Paulson 2011, [3]Layberry et al. 1998, [4]DFO 2014

Sources: BSC et al. 2006 (OBBA); MNRF 2014 Make-a-natural heritage map (NHIC); MNRF 2014 (Halton MNRF SAR List); Jones et al. 2015 (Ontario Butterfly Atlas).

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grain in the Long Point, Rondeau, Lake. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[cxlviii] Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[i] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Not SWH. No standing water or waterfowl concentrations were identified during the field studies

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district	Canada Goose Cackling Goose Snow Goose Green-winged Teal American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Blue-winged Teal Hooded Merganser Common Merganser Red-breasted Merganser Lesser Scaup Greater Scaup Common Goldeneye Bufflehead Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Canvasback Redhead Ruddy Duck Brant White-winged Scoter Black Scoter	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[i] or more of listed species for 7 days[i], results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMIST[cxlix] Index #7 provides development effects and mitigation measures.	Not SWH. Large aquatic areas capable of supporting large numbers of waterfowl are not found on the subject site.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area					
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network • Canadian Wildlife Service (CWS) Ontario Shorebird Survey • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000[i] shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100[i] Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #8 provides development effects and mitigation measures.	Not SWH. Large coastal shorelines or associated habitats are not found on the subject site.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Raptor Wintering Area					
Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class. Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW Bald Eagle: Forest Community Series: FOD, FOM, FOC, SWD, SWM, or SWC, on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering (hawk/owl) sites need to be > 20ha[cxlviii, cxlix] with a combination of forest and upland[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags aviable for roosting[cxlix] Information Sources • OMNRF Districts • Natural clubs • Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from CAs • Results of Christmas Bird Counts	Studies confirm the use of these habitats by: • One or more Short-eared Owls, or, One of more Bald Eagles or; at least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds[i]. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Not SWH. Open habitat of sufficient size adjacent to woodlands is not found on the subject site.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula					
Rationale: Bat hibernacula, are rare habitats in all Ontario landscapes.	Big Brown Bat Eastern Pipistrelle/Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Active mine sites should not be considered The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Centre (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts	• All sites with confirmed hibernating bats are SWH[i]. • The area includes 200m radius around the entrance of the hibernaculum[cxlviii, ccvii, í]. for the development types and 1000m for wind farms [ccv.] • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the[ccv]."Bats and Bat Habitats: Guidelines for Wind Power Projects" [ccv] • SWHMIST[cxlix] Index #1 provides development effects and mitigation measures.	Not SWH. The MNRF has been contacted for background information including potential bat hibernacula locations.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Maternity Colonies					
Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in building [sxxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii]. • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii]. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]. Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts	Maternity Colonies with confirmed use by: • >10 Big Brown Bats[í] • >5 Adult Female Silver-haired Bats[í] • The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[í]. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv]. • SWHMIST[cxlix] Index #12 provides development effects and mitigation measures.	Candidate SWH. Woodlands are present which contain large snags, particularly within the Dry-Fresh Sugar Maple-White Ash Deciduous Forest (FOD5-8).

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. <u>Information Sources</u> • OMNR for possible locations and contact for local experts • University of Waterloo, Biology Department	Long Point (42°35'N, 80°30'E to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS[cxlix] Index #38 provides development effects and mitigation measures.	Not SWH. The confirmation criteria for this category is still being determined by the MNRF.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles: ELC Community Classes: SW, MA, OA and SA ELC Community Series: FEO and BOO Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH Information Sources • EIS studies carried out by Conservation Authorities • Field naturalists clubs • OMNRF Ecologist or Biologist • Natural Heritage Information Centre (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant[j]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[j]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – Apr)[cvii]. Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Not SWH. Although Midland Painted Turtle were observed within the golf course ponds during the spring and may have overwintered, such man-made habitat is not considered SWH.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Reptile Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite in southern Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information available from CAs • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • Natural Heritage Information Centre (NHIC)	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp., or, individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)[i]. • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[i]. • SWHMIST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula.	Not SWH. No snake hibernacula were identified within the subject property during field studies.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]. • Bird Studies Canada: Nature Counts http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii]. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #4 provides development effects and mitigation measures.	Not SWH. Eroding banks or cliffs are not present within the subject property.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). • Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of 2 or more active nests of Great Blue Heron or other list species. • The habitat extends from the the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH[cc, ccvii]. • Confirmation of active colonies must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMIST[cxlix] Index #5 provides development effects and mitigation measures.	Not SWH. No heron nests were identified within the subject property during field surveys.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[i]. • Presence of 5 or more pairs for Brewer's Blackbird[i]. • The edge of the colony and a minimum 150m radius area of the habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii]. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMIST[cxlix] Index #6 provides development effects and mitigation measures.	Not SWH. Shorelines and islands associated with large bodies of water are not present on the subject site.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field: CUM CUT CUS Forest: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10ha in size with a combination of field and forest habitat present, and will be located within 5km of Lake Ontario and Erie[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix]. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli]. Information Sources • MNRF District Offices • Natural Heritage Information Centre (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur[xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant[j]. • SWHMIST[cxlix] Index #16 provides development effects and mitigation measures.	Not SWH. Subject property is not within 5km of Lake Ontario.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high numbers are most significant	All migratory songbirds Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >5 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat • If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie or Ontario are more significant[cxlix]. • Sites have a variety of habitats: forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario and Lake Erie are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates[i]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (March/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi]. • SWHMIST[cxlix] Index #9 provides development effects and mitigation measures.	Not SWH. Subject property is not within 5km of Lake Ontario.

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions [cxlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	• Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha[i]. • Deer movement during winter in Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[i]. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv], ground or road surveys, or a pellet count deer density survey[ccxxv]. • SWHMIST[cxlix] Index #2 provides development effects and mitigation measures.	Not SWH. Deer management is an MNRF responsibility.

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMIST[cxlix] Index #21 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size Information Sources • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location information available on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp)[i]. • SWHMIST[cxlix] Index #20 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 7E	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 **Five Alvar Indicator Species:** 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 7E[cxlix]	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5ha in size[lxxv]. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie[cxcix]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Staff • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five **Alvar indicator species**[lxxv] at a candidate Alvar site is Significant • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMIST[cxlix] Index #17 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Old Growth Forest					
Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old growth forests are characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland area is >0.5ha Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Districts • Field naturalist clubs • Conservation Authorities • Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii]. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities [cxlviii] (cut stumps will not be present) • Determine ELC Vegetation Type for forest area containing the old growth characteristics[lxxviii]. • SWHMIST[cxlix] Index #23 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[i] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNRF Districts • Natural Heritage Information Centre (NHIC) has location data available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present[i]. Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #18 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario)[cc].	No minimum size to site[i]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Centre (NHIC has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present[i]. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Vegetation Type is the SWH[lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMIST[cxlix] Index #19 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 7E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Study Area
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii]. The OMNRF/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Centre (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Not SWH. This habitat was not identified during ELC or vegetation surveys.

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends: 120m[cxlix] from a wetland (>0.5ha) or a wetland (>0.5ha) with small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[j], or, • Presence of 10 or more nesting pairs for listed species including Mallards[j]. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMIST[cxlix] Index #25 provides development effects and mitigation measures.	Not SWH. Nesting waterfowl of the species listed were not observed in sufficient abundance during breeding bird surveys.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario • MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point format and does not include all the habitat. • Nature Counts, Ontario Nest Records Scheme data • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH[ccvii], maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi, ccvii]. Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥3 years or suspected of not being used for >5 years before being considered not significant[ccvii]. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #26 provides development effects and mitigation measures.	Not SWH. Large bodies of water suitable for Bald Eagle or Osprey are not found on the subject property.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands combined >30ha or with >4ha of interior habitat[lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF Districts • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of habitat is the SWH[ccvii].(the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMIST[cxlix] Index #27 provides development effects and mitigation measures.	Not SWH. Woodlands of sufficient size are not found on the subject property.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) Field naturalist clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[l] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observation studies observing the turtles nesting is a recommended method. • SWHMIST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Not SWH. Sand or gravel areas adjacent to waterbodies were not observed within the subject property.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxlix, cxx, cxxi, cxxii, cxiii, cxiv]. <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped	Field Studies confirm: • Presence of a site with 2 or more[i] seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat[cxlviii]. • SWHMIST[cxlix] Index #30 provides development effects and mitigation measures.	Not SWH. Seeps and springs were not identified during field surveys within the subject property.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx]. Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii]. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts and wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. • A combination of observational study and call count surveys [cviii] will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area[lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi]. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMIST[cxlix] Index #14 provides development effects and mitigation measures.	Confirmed SWH. During anuran call counts in April, May and June, 4 out of 8 monitoring stations recorded sufficient diversity and abundance of frog species to be considered significant. These included ANR-001, ANR-002, ANR-007 and ANR-008.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario Landscapes	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m^2 (about 25m diameter)[ccvii] supporting high species diversity are significant: some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs	Studies confirm: • Presence of breeding population of 1or more of the listed newt/salamander species or 2 or more of the listed frog or toad species and with at least 20 breeding individuals (adults and eggs masses)[lxxi, lxxiii] or 2 or more of the listed frog/toad species with Call Level of 3. or; Wetland with confirmed breeding Bullfrogs are significant[l]. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii to determine breeding/larval stages will be required during the spring (May March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMIST[cxlix] Index #15 provides development effects and mitigation measures.	Not SWH. Pond at ANR-006 is more than 120m from a woodland, however did not meet species criteria.

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30ha[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix]. • Interior forest habitat is at least 200m from forest edge habitat[clxiv]. Information Sources • Local birder clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species. • Reports and other information available from CAs	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species[i]. • Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH[i]. • Conduct field investigations in early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #34 provides development effects and mitigation measures.	Not SWH. Woodlands are of insufficient size to contain habitat for area sensitive bird species. Area sensitive bird species were not observed during breeding bird surveys on the subject property.

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • OMNRF Districts and wetland evaluations • Field naturalist clubs • Natural Heritage Information Centre (NHIC) • Reports and other information available from CAs • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species[i]. • Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH[i]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #35 provides development effects and mitigation measures	Not SWH. Marsh bird species were not observed within the subject property.

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30ha[clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps Ministry of Agriculture • Local birder clubs • Ontario Breeding Bird Atlas[ccv] • EIS Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species[i]. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #32 provides development effects and mitigation measures	Not SWH. Grasslands of sufficient size are not present on the subject property.

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat such as woodland area for some bird species.	Large natural field areas succeeding to shrub and thicket habitats >10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[i]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species[clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[i]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat[i]. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMIST[cxlix] Index #33 provides development effects and mitigation measures.	Not SWH. Large shrub thickets of sufficient size are not present on the subject property.

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [Ccii]	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci]. • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the large ecosite area is the SWH • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci] • SWHMIST[cxlix] Index #36 provides development effects and mitigation measures.	Not SWH. Terrestrial crayfish chimneys were not observed during field surveys.

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: These species are quite rare or have experienced significant population declines in Ontario	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists and element occurrences for these species. • NHIC Website: "Get Information" http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat neess to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat for foraging habitat. • SWHMIST[cxlix] Index #37 provides development effects and mitigation measures.	Confirmed SWH. Several species of conservation concern were identified within the subject property including Eastern Wood-Pewee and Monarch butterfly. These species are discussed in further detail within the Natural Heritage Characterization Report (NRSI 2015).

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 7E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Study Area
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Blue-spotted Salamander Spotted Salamander Four-toed Salamander Gray Treefrog Northern Leopard Frog Pickerel Frog Western Chorus Frog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat[clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi] Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[I]. Information Sources • MNRF District Office • Natural Heritage Information Centre NHIC • Reports and other information available from CAs • Field naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m[cxlix] • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMIST[cxlix] Index #40 provides development effects and mitigation measures.	Not SWH. No Amphibian Breeding Habitat - Wetland was confirmed within the subject property.

Map 1

Halton Hills Premier Gateway

Property Access

Legend

- Subject Area
- Highway
- Primary Road
- Secondary Road
- Permanent Watercourse
- Ephemeral Watercourse
- Headwater Drainage Feature Assessment (Parish)
- Watercourse (MNRF)
- Property Boundary

Date Access Provided

- April 28, 2015
- May 5, 2015
- June 26, 2015
- August 5, 2015
- November 3, 2015
- December 3, 2015

592000 593000 594000 595000

4826000 4825000 4824000

HD 5 8TH LINE TRAFALGAR RD HORNBY RD STEELES AVE HWY 401 AUBURN RD 6TH LINE East Sixteen Mile Creek

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: January 21, 2016	NAD83 - UTM Zone 17 Size: 11x17" **1:12,500**

0 400 800 Metres

N

Path: X:\1624_HaltonHillsGatewaySecondaryPlan\NRSI_1624_Map1_PropertyAccess_13K_2016_01_21_KEF.mxd

Ecological Land Classification

Field Data Forms

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

*within golf course

Site:	Halton Hills Secondary Plan
Polygon:	4
UTM:	
Date:	May 4/15
Time:	
Surveyor(s):	AMD, NGM
Weather:	21°C, wind 4/SW, 50% cc

Community Classification

SWM1-1
SWMM1-1

Vegetation Type:		wh. cedar - Hardwood Mineral Mixed Swamp
	Inclusion:	
	Complex:	

Polygon Description

System		Substrate		Topo Feature			Community		
	Terrestrial		Organic		Lacustrine		Talus		Lake		Barren
X	Wetland	X	Mineral Soil	X	Riverine		Crevice/Cave		Pond		Meadow
	Aquatic		Parent Mtn.	X	Bottomland		Alvar		River		Prairie
			Acidic Bedrock		Terrace		Rockland		Stream		Thicket
History			Basic Bedrock		Valley Slope		Beach/Bar		Marsh		Savannah
X	Natural		Carb. Bedrock		Tableland		Sand Dune	X	Swamp		Woodland
	Cultural				Roll. Upland		Bluff		Fen		Forest
		Site			Cliff				Bog		Plantation

Cover			Open Water	Plant Form					
	Open		Shallow Water		Plankton		Forb		Coniferous
	Shrub	X	Surficial Dep.		Submerged		Lichen	X	Mixed
X	Treed		Bedrock		Floating-Lvd.		Bryophyte		
					Graminoid		Deciduous		

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	4	wh. cedar > yellow birch > green ash
2	Sub-canopy	3	3	wh. cedar > wh. elm > green ash
3	Understorey	4	4	red-osier dogwood > Man. maple > Typha latifolia
4	Groundcover	5	4	reed canary grass > lance leaf aster > Sp. jewelweed

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	O	< 10	A	10 - 24	A	25 - 50	R	> 50
Snags	N	< 10	R	10 - 24	N	25 - 50	N	> 50
Deadfall/Logs	R	< 10	R	10 - 24	N	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer		Young	X	Mid-age		Mature		Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
wh. elm	R	O	O		
willow sp.	R	R	O		
wh. cedar	A	A	O		
multiflora rose			O		
basswood		R	R		
Man. maple		O	O		
crack willow	R				
green ash	O	O	O		
R.O. dogwood			A		
yellow birch	O	O			
bl. cherry		R			
bur oak	R	O			

Species	Layer 1	2	3	4	Sample
marsh marigold				O	
reed canary				A	
garlic mustard				O	
wild cucumber				R	
Typha lat.				A	
tall goldenrod				O	
sp. jewelweed				A	
lance leaf aster				A	
Phragmites				O	
?					

Other Notes (Landowner Contact, General Notes, etc.)

- golf course property
- low-lying feature w/ pond @ NE corner

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

Site:	Halton Hills Secondary Plan (#1624)
Polygon:	1
UTM:	
Date:	May 4/15 — Time:
Surveyor(s):	AMD, NGM
Weather:	21°C, wind S/SW, 40% CC.

Community Classification

Vegetation Type:	Fresh-Moist Mixed Meadow MEMM4
Inclusion:	Graminoid Mineral Meadow Marsh MAMM1
Complex:	Cattail Graminoid Mineral Meadow Marsh MAMM1-3

CUM1
MAM2
MAS2-1

Polygon Description

System	Substrate	Topo Feature		Community	
X Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	X Mineral Soil	Riverine	Crevice/Cave	Pond	X Meadow
Aquatic	Parent Min.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
X Natural	Carb. Bedrock	X Tableland	Sand Dune	Swamp	Woodland
Cultural		Roll. Upland	Bluff	Fen	Forest
	Site	Cliff		Bog	Plantation

Cover		Plant Form		
X Open	Open Water	Plankton	Forb	Coniferous
Shrub	X Surficial Dep.	Submerged	Lichen	Mixed
Treed	Bedrock	Floating-Lvd.	Bryophyte	
		Graminoid	Deciduous	

Stand Description

	Layer	HT	Cover	Species
~~5~~	~~Super-canopy~~			
~~1~~	~~Canopy~~			
2	Sub-canopy	3	2	hawthorn sp. > Man. maple > Euro. buckthorn
3	Understorey	4	3	bl. raspberry > red-osier dogwood
4	Groundcover	5-7	~~3~~ 4	smooth brome > lance leafed aster > reed canary grass

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0: none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	O	< 10	R	10 - 24	N	25 - 50	N	> 50
Snags	N	< 10	N	10 - 24	N	25 - 50	N	> 50
Deadfall/Logs	R	< 10	N	10 - 24	N	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age	Pioneer	X Young	Mid-age	Mature	Old Growth

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Modified ELC Community Description Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
hawthorn sp.					
Euro. buckthorn					
Man. maple					
wh. elm					
common pear					
E. cottonwood					
bl. raspberry					
R.O. dogwood					

Species	Layer 1	2	3	4	Sample
smooth brome				A	
Galium mollugo				A	
Canada goldenrod				O	
avens sp.				A	
elecampane				O	
wild carrot				O	
fleabane				O	
curly dock				R	
lance leaf aster				A	
tall goldenrod				A	
common St. johns wort				R	
reed canary				A	
Typha angust.				R	
Phragmites				R	
purple loose.				R	

Other Notes (Landowner Contact, General Notes, etc.)

~~- very little wet in adjacent watercourse~~
- occurs throughout subject area

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page __ of __

Site: Halton Hills Secondary Plan (#1624)	
Polygon: 6	
UTM:	
Date: May 4/15	Time:
Surveyor(s): AMD, NGM	
Weather: 21°C, wind 4/SW, 50% CC	

Community Classification

Vegetation Type:	Deciduous Plantation	TAGM3 (CUP1-3)
① X Inclusion:	Coniferous Plantation	TAGM1 (CUP3)
② X ~~Complex:~~ incl.	Dry-Fresh Poplar Decid. Forest ↳ lg. tooth aspen	FODM3-1 (FOD3-1)

Polygon Description

System	Substrate	Topo Feature		Community	
[X] Terrestrial	[ ] Organic	[ ] Lacustrine	[ ] Talus	[ ] Lake	[ ] Barren
[ ] Wetland	[X] Mineral Soil	[ ] Riverine	[ ] Crevice/Cave	[ ] Pond	[ ] Meadow
[ ] Aquatic	[ ] Parent Min.	[X] Bottomland	[ ] Alvar	[ ] River	[ ] Prairie
	[ ] Acidic Bedrock	[ ] Terrace	[ ] Rockland	[ ] Stream	[ ] Thicket
History	[ ] Basic Bedrock	[ ] Valley Slope	[ ] Beach/Bar	[ ] Marsh	[ ] Savannah
[ ] Natural	[ ] Carb. Bedrock	[X] Tableland	[ ] Sand Dune	[ ] Swamp	[ ] Woodland
[X] Cultural		[ ] Roll. Upland	[ ] Bluff	[ ] Fen	[ ] Forest
	Site	[ ] Cliff		[ ] Bog	[X] Plantation

Cover	Site	Plant Form		
[ ] Open	[ ] Open Water	[ ] Plankton	[ ] Forb	[ ] Coniferous
[ ] Shrub	[ ] Shallow Water	[ ] Submerged	[ ] Lichen	[ ] Mixed
[X] Treed	[X] Surficial Dep.	[ ] Floating-Lvd.	[ ] Bryophyte	
	[ ] Bedrock	[ ] Graminoid	[X] Deciduous	

Stand Description

Layer	HT	Cover	Species
~~Super Canopy~~			
1 Canopy	2	4	bl. walnut > bur oak > wh. ash > E. cottonwood
2 Sub-canopy	3	3	bl. walnut > wh. ash > Euro. buckthorn
3 Understorey	4	4	choke cherry > bl. raspberry > tart. honeysuckle
4 Groundcover	5-7	4	wild strawberry > avens sp. > heal-all

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0: none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	A	< 10	A	10 - 24	O	25 - 50	R	> 50
Snags	R	< 10	R	10 - 24	R	25 - 50	N	> 50
Deadfall/Logs	O	< 10	O	10 - 24	R	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age	[ ] Pioneer	[ ] Young	[X] Mid-age	[ ] Mature	[ ] Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
bl. walnut	A	A	O		
bur oak	A	O	O		
Euro. buckthorn		A	A		
Scots pine	O	O			
choke cherry			A	O	
bl. raspberry			A	O	
bl. walnut	A	A	O		
trembl. aspen	R	O			
wh. ash	O	O	O		
bebb's willow		O	O		
Tart. honeysuckle	R		A	O	
E. cottonwood	O	O			
poison ivy (ryd)				O	
multiflora rose		O	O		
basswood	R	R			
wh. pine	O	O			
silver maple	R	R			
R.O. dogwood			O	O	
lg. tooth aspen	O	O			
Viburnum opulus			O	O	
* butternut	R				
gray dogwood			O	O	
slender willow			R		

Species	Layer 1	2	3	4	Sample
wild strawberry				A	
avens sp.				A	
tall buttercup				O	
elecampane				O	
heal all				A	
teasel				R	
lance leaf aster				O	
dandelion				O	
wood. agrimony				O	
com. blue violet				R	
calico aster				O	
garlic mustard				O	
wild cucumber				R	
orchard grass				O	
reed canary				R	
dame's rocket				O	
elecampane				O	

Other Notes (Landowner Contact, General Notes, etc.)

- red ants present
- deciduous plantation (bl. walnut, bur oak, wh. ash, E. cottonwood), & small areas of conifer plantation
- naturalizing well

* - 17T 0593075 4825565 (3 completely dead, ~20-25cm dbh)

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Modified ELC Community Description Page __ of __

Site: Halton Hills Secondary Plan	
Polygon: 8	
UTM:	
Date: May 4/15	Time:
Surveyor(s): AMD, NGM	
Weather: 21°C, wind 4/SW, 50% CC.	

Community Classification

Vegetation Type:	Mixed Plantation
Inclusion:	
Complex:	

TACM2 (CUP2)

Polygon Description

System	Substrate	Topo Feature		Community	
X Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	X Mineral Soil	Riverine	Crevice/Cave	Pond	Meadow
Aquatic	Parent Mn.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
Natural	Carb. Bedrock	X Tableland	Sand Dune	Swamp	Woodland
X Cultural		Roll. Upland	Bluff	Fen	Forest
	Site	Cliff		Bog	X Plantation

Cover	Site	Plant Form		
Open	Open Water	Plankton	Forb	Coniferous
Shrub	Shallow Water	Submerged	Lichen	X Mixed
X Treed	X Surficial Dep.	Floating-Lvd.	Bryophyte	
	Bedrock	Graminoid	X Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	4	wh. pine = wh. ash
2	Sub-canopy	3	3	wh. ash > alt. leaf dogwood > Scots pine
3	Understorey	4	3	tart. honeysuckle > bl. raspberry > choke cherry
4	Groundcover	5-7	3	Avens sp. > wild strawberry > dame's rocket

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0: none 1: 0 - 10% 2: 10 - 25 3: 25 - 50% 4: >50%

Size Class Analysis	A	< 10	A	10 - 24	R	25 - 50	N	> 50
Snags	O	< 10	O	10 - 24	R	25 - 50	N	> 50
Deadfall/Logs	O	< 10	O	10 - 24	N	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer	X	Young		Mid-age		Mature		Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
wh. pine	A	R			
R.O. dogwood			O	O	
wh. ash	A	A			
tart. honeysuckle			A	O	
red raspberry			O	O	
bl. raspberry			A	O	
choke cherry			O	O	
river grape				O	
scots pine		O			
alt. leaf dogwood		O			

Species	Layer 1	2	3	4	Sample
avens sp.				A	
Con. burdock				O	
dandelion				O	
wild strawberry				A	
dame's rocket				A	
fleabane				R	

Other Notes (Landowner Contact, General Notes, etc.)

- naturalizing plantation, conifer/decid. mixed, wh. pine - wh. ash NRM
- lots of dead ash

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

Site:	Halton Hills Secondary Plan (#1624)
Polygon:	2
UTM:	
Date:	May 4/15 — Time:
Surveyor(s):	AMD, NGM
Weather:	21°C, wind 4/SW, 40% CC.

Community Classification

Vegetation Type:	Coniferous Plantation TAGM1	CUP3
Inclusion:		
Complex:		

Polygon Description

System		Substrate		Topo Feature			Community		
X	Terrestrial		Organic		Lacustrine		Talus		Lake		Barren
	Wetland	X	Mineral Soil		Riverine		Crevice/Cave		Pond		Meadow
	Aquatic		Parent Mtn.		Bottomland		Alvar		River		Prairie
			Acidic Bedrock		Terrace		Rockland		Stream		Thicket
History			Basic Bedrock		Valley Slope		Beach/Bar		Marsh		Savannah
	Natural		Carb. Bedrock	X	Tableland		Sand Dune		Swamp		Woodland
X	Cultural				Roll. Upland		Bluff		Fen		Forest
		Site			Cliff				Bog	X	Plantation

Cover		Site		Plant Form			
	Open		Open Water		Plankton		Forb	X	Coniferous
	Shrub	X	Surficial Dep.		Submerged		Lichen		Mixed
X	Treed		Bedrock		Floating-Lvd.		Bryophyte		
					Graminoid		Deciduous		

Stand Description

	Layer	HT	Cover	Species
~~*~~	~~Super-canopy~~			
~~1~~	~~Canopy~~			
2	Sub-canopy	3	4	Norway spruce >> hawthorn sp.
3	Understorey	4	3	Tart. honeysuckle > choke cherry > wh. ash
4	Groundcover	5	1	wild strawberry > garlic mustard > dandelion

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis		< 10		10 - 24		25 - 50		> 50
	O		A		N		N	
Snags	N	< 10	N	10 - 24	N	25 - 50	N	> 50
Deadfall/Logs	N	< 10	R	10 - 24	N	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer	X	Young		Mid-age		Mature		Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
hawthorn sp.		O			
~~gray goldenrod~~					
E. cottonwood		R			
bur oak		R			
choke cherry			O	O	
Tart. honeysuckle			O	O	
Norway spruce		A	R		
wh. ash			O	O	
wh. spruce		R			
gray dogwood			R		

Species	Layer 1	2	3	4	Sample
garlic mustard				A	
wild strawberry				A	
Calic o aster				R	
dandelion				O	
Hypericum perf				R	

Other Notes (Landowner Contact, General Notes, etc.)

- very little to no groundcover in plantation
- plantation used as recreation area for patients

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

Site:	Halton Hills Secondary Plan
Polygon:	5
UTM:	
Date:	May 4/15 — Time:
Surveyor(s):	AMD, NGM
Weather:	21°C, wind N/SW, 50% cc.

Community Classification

	Vegetation Type:	Dry-Fresh Sugar Maple-wh. Ash Decid. Forest
(1) X	Inclusion:	Smooth Brome Graminoid Meadow
(2) X	~~Complex~~: incl.	Coniferous Plantation

FODM5-8 (FOD5-8)
MEGM3-5 (N/A)
TAGM1 (N/A)

Polygon Description

System	Substrate	Topo Feature		Community	
X Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	X Mineral Soil	Riverine	Crevice/Cave	Pond	Meadow
Aquatic	Parent Min.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
X Natural	Carb. Bedrock	Tableland	Sand Dune	Swamp	Woodland
Cultural		X Roll. Upland	Bluff	Fen	X Forest
	Site	Cliff		Bog	Plantation

Cover	Site	Plant Form		
Open	Open Water	Plankton	Forb	Coniferous
Shrub	Shallow Water	Submerged	Lichen	Mixed
X Treed	X Surficial Dep.	Floating-Lvd.	Bryophyte	
	Bedrock	Graminoid	X Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	1-2	4	Sugar maple > beech > red oak > wh. ash
2	Sub-canopy	3	4	wh. ash > sugar maple > hawthorn sp.
3	Understorey	4	3	wh. ash > choke cherry > Euro. buckthorn
4	Groundcover	5-7	4	trout lily > garlic mustard > strawberry bush

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	A	< 10	A	10 - 24	A	25 - 50	O	> 50
Snags	N	< 10	N	10 - 24	N	25 - 50	N	> 50
Deadfall/Logs	O	< 10	R	10 - 24	R	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age	Pioneer	Young	Mid-age	X Mature	Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___ of ___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
wh. ash	O	A	A		
sugar maple	A	A	O		
rubus multiflora rosa			O	O	
beech	O	R			
choke cherry			A	O	
river grape				O	
hawthorn sp.		O	O		
basswood	O	O			
red oak	O	O			
bl. raspberry			R	R	
Euro. buckthorn			O	O	
Man. maple			O	O	
Scots pine			R		
Norway spruce	R	R			

Species	Layer 1	2	3	4	Sample
trout lily				A	
strawberry bush				A	
garlic mustard				A	
Lobelia inflata				R	
avens sp.				O	
motherwort				O	
wild cucumber				R	
mayapple				O	
Virg. waterleaf				R	
wild leek				R	
com. blue violet				O	
smooth brome				O	
Com. burdock				R	
Potentilla recta				R	

Other Notes (Landowner Contact, General Notes, etc.)

- tree cutting in a feature,
- mature portions in undisturbed areas
- lots of sugar maple + wh. ash regen. in disturbed areas

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

Site:	Halton Hills Secondary Plan
Polygon:	7
UTM:	
Date:	May 4/15 Time:
Surveyor(s):	AMD, NGM
Weather:	21°C, wind 4/SW, 50% cc.

Community Classification

Vegetation Type:		F-M Lowland Decid. Forest
	Inclusion:	
	Complex:	

FODM7 (FOD7)

Polygon Description

System		Substrate		Topo Feature		Community	
X	Terrestrial		Organic		Lacustrine		Talus		Lake		Barren
	Wetland	X	Mineral Soil	X	Riverine		Crevice/Cave		Pond		Meadow
	Aquatic		Parent Min.		Bottomland		Alvar		River		Prairie
			Acidic Bedrock		Terrace		Rockland		Stream		Thicket
History			Basic Bedrock		Valley Slope		Beach/Bar		Marsh		Savannah
X	Natural		Carb. Bedrock		Tableland		Sand Dune		Swamp		Woodland
	Cultural				Roll. Upland		Bluff		Fen	X	Forest
		Site			Cliff				Bog		Plantation

Cover				Plant Form					
	Open		Open Water		Plankton		Forb		Coniferous
	Shrub	X	Shallow Water		Submerged		Lichen		Mixed
X	Treed		Surficial Dep.		Floating-Lvd.		Bryophyte		
			Bedrock		Graminoid	X	Deciduous		

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	2	4	green ash > bl. walnut > Manitoba maple
2	Sub-canopy	3	3	bl. walnut > Manitoba maple > green ash
3	Understorey	4	2	R.D. dogwood > Euro. buckthorn > tart. honeysuckle
4	Groundcover	5-7	4	dame's rocket > avens sp. > garlic mustard

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	A	< 10	A	10 - 24	O	25 - 50	R	> 50
Snags	R	< 10	R	10 - 24	R	25 - 50	N	> 50
Deadfall/Logs	O	< 10	O	10 - 24	R	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer	X	Young		Mid-age		Mature		Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___of___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
basswood	R	R			
bl. walnut	O	A			
bur oak	O	O			
E. cottonwood	O	O			
R.D. dogwood			A	O	
multiflora rose			R		
poisonivy (cryd)				O	
Man. maple	O	A			
tart. honeysuckle			O	O	
Euro. buckthorn			O	O	
Viburnum opulus				O	
gr. ash	A	O			

Species	Layer 1	2	3	4	Sample
dame's rocket				A	
tall goldenrod				O	
Galium mollugo				O	
avens sp.				A	
garlic mustard				A	
Dig. sticksead				R	

Other Notes (Landowner Contact, General Notes, etc.)

- Community resulting from naturalization of riparian area, seed source from deciduous plantation adjacent to

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page __ of __

*within golf course

Site:	Halton Hills Secondary Plan
Polygon:	3
UTM:	
Date:	May 4/15
Time:	
Surveyor(s):	AMD, NCM
Weather:	21°C, wind 4/SW, 40% CC

Community Classification

FOD7-3

Vegetation Type:	F-M willow Lowland Decid. Forest	(FODM7-3) ~~FODM7-3~~
Inclusion:		
Complex:		

Polygon Description

System		Substrate		Topo Feature			Community			
X	Terrestrial		Organic		Lacustrine		Talus		Lake		Barren
	Wetland	X	Mineral Soil	X	Riverine		Crevice/Cave		Pond		Meadow
	Aquatic		Parent Min.	X	Bottomland		Alvar		River		Prairie
			Acidic Bedrock		Terrace		Rockland		Stream		Thicket
History			Basic Bedrock		Valley Slope		Beach/Bar		Marsh		Savannah
X	Natural		Carb. Bedrock		Tableland		Sand Dune		Swamp		Woodland
	Cultural				Roll. Upland		Bluff		Fen	X	Forest
		Site			Cliff				Bog		Plantation

Cover				Plant Form					
	Open		Open Water		Plankton		Forb		Coniferous
	Shrub	X	Surficial Dep.		Submerged		Lichen		Mixed
X	Treed		Bedrock		Floating-Lvd.		Bryophyte		
					Graminoid	X	Deciduous		

Stand Description

	Layer	HT	Cover	Species
*	~~Super-canopy~~			
1	Canopy	1/2	4	weeping willow > bl. walnut > freeman's maple = hawey locust
2	Sub-canopy	3	3	wh. elm > bl. walnut > bur oak
3	Understorey	4	3	bl. walnut > wh. elm > bl. raspberry
4	Groundcover	5-7	4	reed canary grass > lance leaf aster > smooth brome

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	0	< 10	0	10 - 24	0	25 - 50	0	> 50
Snags	N	< 10	N	10 - 24	N	25 - 50	N	> 50
Deadfall/Logs	N	< 10	N	10 - 24	N	25 - 50	N	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age		Pioneer		Young	X	Mid-age		Mature		Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page ___of___

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
weeping willow	A				
* hawey locust	O	R			
hawthorn sp.		O			
bl. walnut	O	O	O		
bur oak	O	O	O		
Viburnum opulus		R	R		
wh. elm		R	R		
bl. raspberry			A		
freeman's maple	O	O			

Species	Layer 1	2	3	4	Sample
reed canary				A	
lance leaf aster				A	
smooth brome				O	
Typha angust				O	

Other Notes (Landowner Contact, General Notes, etc.)

*thistle present, may be naturally occurring, some individuals thornless

Map 1

Halton Hills Premier Gateway Secondary Plan

Existing Conditions

Legend

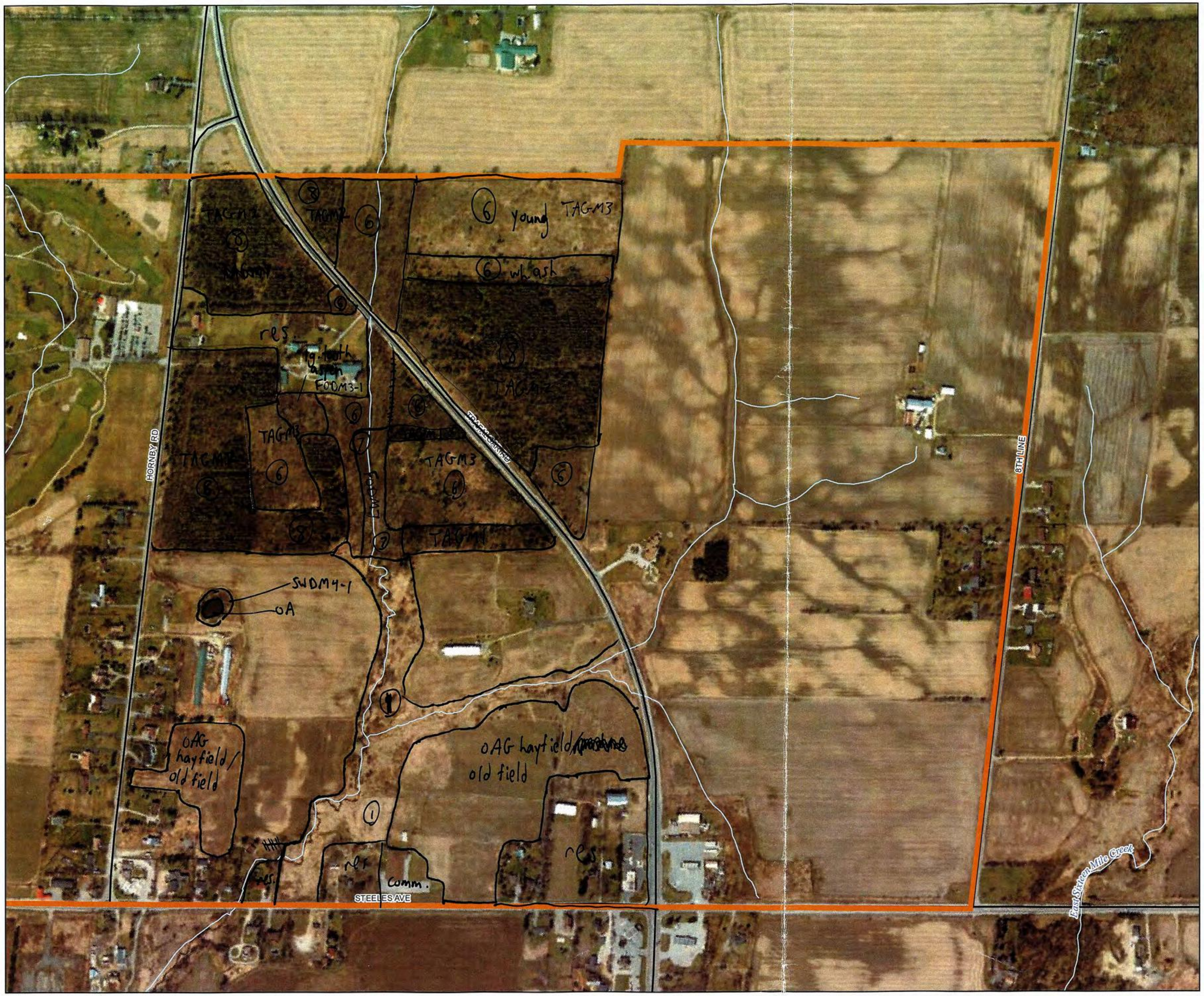
- Subject Area
- Highway
- Primary Road
- Secondary Road
- Watercourse
- Wetland (Non-PSW)
- Wooded Area
- Natural Heritage Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: April 06, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:12,500**

0 400 800 Metres

N



Map 2

Halton Hills Premier Gateway Secondary Plan

Field Map - North

Legend

- Subject Area
- Primary Road
- Secondary Road
- Watercourse

ash, walnut, pine plantations

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: April 06, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:6,000**

0 200 400 Metres

Vegetation Species by ELC Community

Vegetation Species by ELC Community	Project: Halton Hills
	Project #: 1624
Date: June 29, 2015	Cloud Cover (%): 30
Time: 6:40	Temperature (°C): 16
Observer(s): JBB, NGM	Wind: 0
Survey:	Precipitation: none

Species	POLYGON NUMBER/ELC Community									
	TAGM3									
black walnut	✓	✓								
wh. ash	[illegible]	✓								
burr oak	✓	✓								
tartarian [illegible]	✓									
eu. buckthorn	✓	✓								
am. basswood	✓	✓								
silver maple		✓								
blue spruce		✓								
white avens	✓	✓								
drummond's [illegible]		✓								
cleavers	✓									
common dandelion	✓									
burdock	✓									
chokecherry	✓									
alt. leaved dogwood	✓									
jewelweed	✓									
smooth brome	✓									
garlic mustard	✓	✓								
red raspberry	✓	✓								
canada goldenrod	✓	✓								
riverbank grape	✓	✓								
virginia creeper	✓	✓								

Vegetation Species by ELC Community

Vegetation Species by ELC Community	Project: Halton Hills
	Project #: 1624
Date: June 29, 2015	Cloud Cover (%): 80
Time: 7:00	Temperature (°C): 17
Observer(s): JBB, NGM	Wind: 0
Survey:	Precipitation: none

Species	POLYGON NUMBER/ELC Community									
	[illegible]									
[illegible]	C									
crack willow	C									
black walnut	C									
[illegible] willow	C									
white pine	O									
white ash	O									
blue spruce	O									
apple	O									
norway maple	O									
freeman's maple	R									
elm sp.	O									
american basswood	O									
[illegible] willow	O									
staghorn sumac	O									
eastern cottonwood	R									
wh. cedar	R									
norway spruce	O									
black raspberry	O									
timothy	O									
commonweed	O									
coltsfoot	O									
red clover	O									
teasel	O									
quack grass	O									
common milkweed	R									
dandelion	R									
canada goldenrod	O									
bittersweet nightshade	R									
jewelweed	O									
eu. buckthorn	O									
burdock	R									
narrow-leaved cattail	O									
bull thistle	R									
dames rocket	R									
garlic mustard	R									
smooth brome	O									
kentucky bluegrass	D									

common mullein R
red osier dogwood R
wild strawberry R
wild cucumber

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Modified ELC Community Description Page 1 of 2

* Roadside ELC *

Site:	Halton Hills Gateway #1624
Polygon:	
UTM:	-
Date:	September 1, 2015 Time: 1042-1106hrs
Surveyor(s):	N6M, CM
Weather:	30°C, Wind S 2, C.C: 0%, No precip.

Community Classification

Vegetation Type:	FODM5-1 Dry-fresh Sugar Maple Deciduous Forest
Inclusion:	
Complex:	—

Polygon Description

System	Substrate	Topo Feature		Community	
X Terrestrial	Organic	Lacustrine	Talus	Lake	Barren
Wetland	X Mineral Soil	Riverine	Crevice/Cave	Pond	Meadow
Aquatic	Parent Min.	Bottomland	Alvar	River	Prairie
	Acidic Bedrock	Terrace	Rockland	Stream	Thicket
History	Basic Bedrock	Valley Slope	Beach/Bar	Marsh	Savannah
X Natural	Carb. Bedrock	Tableland	Sand Dune	Swamp	Woodland
Cultural		X Roll. Upland	Bluff	Fen	X Forest
	Site	Cliff		Bog	Plantation

Cover	Site	Plant Form		
Open	Open Water	Plankton	Forb	Coniferous
Shrub	Shallow Water	Submerged	Lichen	Mixed
X Treed	X Surficial Dep.	Floating-Lvd.	Bryophyte	
	Bedrock	Graminoid	Deciduous	

Stand Description

	Layer	HT	Cover	Species
*	Super-canopy	—	—	—
1	Canopy	1	4	Sugar Maple > White Elm > Black Cherry = A. Beech
2	Sub-canopy		3	Sugar Maple > White Elm > Hophornbeam
3	Understorey		3	Sugar Maple > A. Beech > C. Buckthorn
4	Groundcover		2	Sugar Maple > May Apple

HT Codes: 1: >25m 2: 25 - 10m 3: 10 - 2m 4: 2 - 1m 5: 1 - 0.5m 6: 0.5 - 0.2m 7: <0.2m

Cover Codes: 0:none 1: 0 - 10% 2: 10 - 25 3: 25 - 60% 4: >60%

Size Class Analysis	< 10	10 - 24	25 - 50	> 50
Snags	< 10	10 - 24	25 - 50	> 50
Deadfall/Logs	< 10	10 - 24	25 - 50	> 50

Abundance Codes: N: None R: Rare O: Occasional A: Abundant

Community Age	Pioneer	Young	Mid-age	X Mature	Old Growth

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description Page 2 of 2

PLANT SPECIES LIST

Site:	
Polygon:	
UTM:	
Date:	Time:
Surveyor(s):	
Weather:	

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
Sugar Maple	A	A	O	A	
White Elm	O	O			
Black Cherry	R	R			
White Pine	R				
Hophornbeam		R			
Shagbark Hickory		R			
A. Beech	R		O		
C. Buckthorn			R		
Dogwood Sp.			R		
Balsam Poplar			R		
Ash Sp.			R		

Species	Layer 1	2	3	4	Sample
Spotted Jewelweed				R	
Bitter Nightshade				R	
Tall Goldenrod				R	
Chickory				R	
C. Ragweed				R	
C. Plantain				R	
May Apple				O	

Other Notes (Landowner Contact, General Notes, etc.)

* Roadside ELC *

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: Halton Hills #1624

Polygon: TAGM3

UTM: –

Date: September 1/15 | Time: 0755-0816hrs

Surveyor(s): NGM, CM

Weather: 30°C, wind 52, C.C: 0r., No precip.

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Virginia Creeper					
Tall Goldenrod					
Bur Oak					
Common Buckthorn					
Glossy Buckthorn					
Barren Strawberry					
White Ash					
Canada Goldenrod					
Red osier Dogwood					
Riverbank Grape					
Aster Sp.					4288-4295
Black Walnut					
Tartarian Honeysuckle					
Wild Red Raspberry					
Annual Fleabane					✓(A)
Larger Bur Marigold					92V-92V
Canada Goldenrod					✓(C)
Field Sow Thistle					
Basswood					
Poison Ivy					
Wild Carrot					
White Spruce					

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site: Halton Hills #1624

Polygon: TAGM2

UTM: –

Date: Sept. 1/15 | Time: 0816-0900

Surveyor(s): NGM, CM

Weather: See pg 1

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	Layer 2	Layer 3	Layer 4	Sample
Canada Goldenrod					
White Spruce					
Virginia Creeper					
Wild Red Raspberry					
Calico Aster					✓(B)
Spotted Ragweed					
Goatsbeard					
Chickory					
Birds Foot Trefoil					–
C. Dandelion					
Field Sow Thistle					
Poison Ivy					
Jewelweed					
Sunflower Sp.					
New England Aster					✓(D)
Trembling Aspen					
Red Maple					
Bur Oak					
Evening Primrose					

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Modified ELC Community Description

PLANT SPECIES LIST

Site:	Halton Hills #162
Polygon:	FODM3-1
UTM:	
Date:	Sept. 1/15
Time:	0755-0816hrs
Surveyor(s):	NGM, CM
Weather:	30°c, wind 2 S, C.C: 0%, No precip

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
Canada Goldenrod					
Tall Goldenrod					
White Ash					
Trembling Aspen					
wild Strawberry					
Wild Grape					
C. Buckthorn					
Field Sow Thistle					

Species	Layer 1	2	3	4	Sample

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	Halton Hills #162
Polygon:	TAGM1
UTM:	
Date:	Sept. 1/15
Time:	0755-0816hrs
Surveyor(s):	NGM, CM
Weather:	30°, wind 2S, C.C: 0%, No precip.

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
Tall Goldenrod					
C. Goldenrod					
Wild Grape					
Paten Dry					
Aster sp.					9288-9290
Bare soil					
Wild Strawberry					
White Ash					

Species	Layer 1	2	3	4	Sample

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	Halton Hills #1624
Polygon:	FODM5-8
UTM:	–
Date:	Sept. 1/15
Time:	0900-0945 hrs
Surveyor(s):	NGM, CM
Weather:	30°C, wind ≥5, C.C: 0%, No precip.

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
Field Sow Thistle					
Teasle					
Wild carrot					
C. Mullein					
Bitter Nightshade					
Canada Goldenrod					
Tall Goldenrod					
C. Buckthorn					
V. Creeper					
Sugar Maple					
White Ash					
Poison Ivy					
Running Strawberry					
C. Milkweed					
White Ash					
Wild Strawberry					
Multiflora Rose					
Prickly Ash					
C. Plantain					
Calico Aster					√(F)
Wild Cucumber					
May Apple					

Species	Layer 1	2	3	4	Sample

NATURAL RESOURCE SOLUTIONS INC

Modified ELC Community Description

PLANT SPECIES LIST

Site:	Halton Hills #1624
Polygon:	MEGM3-5
UTM:	–
Date:	Sept. 1/15
Time:	0945-1000 hrs
Surveyor(s):	NGM, CM
Weather:	30°C, wind ≥5, C.C: 0%, No precip.

Layers: 1=canopy 2=sub-canopy 3=understorey 4=ground layer

Abundance Codes: R=rare O=occasional A=abundant D=dominant

Species	Layer 1	2	3	4	Sample
Cow vetch					
Spreading Dogbane					
Multiflora rose					
Sugar Maple					
Goldenrod sp.					√(E)
Canada Goldenrod					
C. Dandelion					
C. Milkweed					
Virginia Creeper					

Species	Layer 1	2	3	4	Sample

Breeding Bird Survey

Field Data Forms

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills

Weather:
Wind speed: 2-3
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: 9 None

Station: BMB- 001
17T 0592340 4823858
Date: June 1, 2015
Start Time: 7:52 a.m.
Observers: NGM / NGC

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Indigo Bunting	•		S			
Rose Breasted Grosbeak		••	S			
~~Song Sparrow~~						
Red Eyed Vireo	•		S			
Redwinged Blackbird		••	H			
A. Crow		•	H			
Brownheaded cowbird		••	P			
Blue Jay		•	H			
A. Goldfinch		••	P			
Song Sparrow	••	••	P			
A. Robin		•	H			
N. Rough winged Swallow	•		X			
Downy Woodpecker		•	S			
Cedar Waxwing		••	P			
Mourning Dove		••	P			

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:
Station - park right befor Lot 8173

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 162K
Project Name: Halton Hills

Weather:

Wind speed: 1-3
Cloud cover: 100 %
Air temperature: 10 °C
Precipitation: —

Station: BMB- 002
17T 0592062 4854586
Date: June 11 15
Start Time: 706 a.m.
Observers: NJGM, NGC

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev
Rose-breasted Grosbeak	1		S			
Song Sparrow		1	S			
A. Goldfinch		1	S			
Baltimore Oriole		1	S			
N. Cardinal		1	S			
A. Robin		1	S			
White-breasted Nuthatch	1	1	H			
Blue Jay		1	H			
A. Crow		1	H			
Canada Goose		9	X			
E. Kingbird		1	S			

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills

Weather:

Wind speed: 2-3
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: None

Station: BMB- 003
17T 0542524 4824383
Date: June 1, 2015
Start Time: 7:10 a.m.
Observers: NGm / NyC

Species Name	Visit 1 Number <50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number <50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Canada Geese	[illegible]		FY			
Song Sparrow	••	••	S			
N. Flicker		•	H			
Red winged blackbird	••	••	P			
N. Robin	••	••	S			
C. Yellowthroat		•	S			
Yellow Warbler		••	S			
Brownheaded cowbird	3	••	P			
Caspian Tern	•		X			
Blue Jay		•	H			
Killdeer	•		N			
Ruby throated Hummingbird	•		H			
Brown thrasher		•	S			
A. Goldfinch	••		P			
E. Starling	4	•	H			
Mourning Dove	4	••	P			
C. Grackle		••	P			
N. Rough winged swallow	•		X			
Barn Swallow	•		H			
Wood Duck	•	3	H			
N. Cardinal	••		P			

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills Premier Gateway

Weather:

Wind speed: 2-3
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: None

Station: BMB- 004
17T 0592841 4824830
Date: June 1, 2015
Start Time: 0655 a.m.
Observers: NGM / NGC

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Great Blue Heron		1	X			
Red-winged Blackbird	2	2	CF			
N. Cardinal	1		S			
A. Robin	1	1	S			
Song Sparrow	2		CF			
E. Kingbird	1		H			
Warbling Vireo	1		S			
Cedar Waxwings	2		P			
Baltimore Oriole		1	S			
E. Kingbird		1	S			
Brown-headed Cowbird		1	H			
A. Goldfinch		1	H			
N. Flicker		1	H			
A. Crow		1	H			
Blue Jay		1	H			
C. Grackle		1	H			
* Barn Swallow		1	H			
Canada Geese		3	H			

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:
Barn Swallow possible nesting on or near grounds. No nests seen. Observed foraging on ground.

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 164
Project Name: Halton Hills

Weather:
Wind speed: 1-2
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: —

Station: BMB- 005
17T 0593075 4825295
Date: June 1/15
Start Time: 0601 a.m.
Observers: NOM, NGC

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Great-crested Flycatcher	•		S			
E. Wood Pewee		•	S			
A. Crow		•	H			
Hairy Woodpecker		•	S			
Song Sparrow	••	•	P			
Black-capped Chickadee		•	S			
Red-tailed Hawk	•		A			
Cedar Waxwing	••		P			
Blue Jay		••	S			
Baltimore Oriole	•	•	S			
A. Robin		•	S			
Red-winged Blackbird	•		X			

Incidental species (>100m, before or after point count from plot vicinity):
Downy Woodpecker (H)
Great Blue Heron (X)

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills Premier Gateway

Weather:
Wind speed: 1-2
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: NONE

Station: BMB- 006
UTM 17T 0593076 4825616
Date: June 1, 2015
Start Time: 6:24 a.m.
Observers: NGM / NGC

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Song Sparrow	1		S			
Common Yellowthroat		1	S			
A. Crow		1	H			
Indigo Bunting	1		S			
A. Robin		2	S			
Redwinged Blackbird		1	X			
A. Goldfinch		2	H			
Brownheaded cowbird	1		H			
Cedar Waxwing		2	P			
Blue Jay		1	H			

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills

Weather:
Wind speed: 2-3
Cloud cover: 100 %
Air temperature: 9 °C
Precipitation: None

Station: BMB-007
17T 0593847 4825488
Date: June 1, 2015
Start Time: 0810 a.m.
Observers: NGM / NGC

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

	Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
	Red-winged Blackbird	::	4	P, CF			
	Rock Pigeon	2		P			
	Savannah Sparrow		::	S			
	Killdeer		:	H			
	Song Sparrow		:	S			
	E. Kingbird		:	S			
	A. Goldfinch		::	S, P			
	Turkey Vulture		::	X			
	Ring-billed Gull		::	X			
*	Barn Swallow	:	3	H, P			
	E. Starling	:	:	H, CF			
	Tree Swallow		:	H			
* *	Bobolink		:	H			
	C. Grackle		:	H			
	Canada Goose		::	X			
	Hmed Cark		:	S			

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:
* seen foraging, nearby barns may provide habitat (Barn swallow)
* * Bobolink male seen in grassy field east of Trafalgar

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills

Weather:

Wind speed: 3
Cloud cover: 100 %
Air temperature: 10 °C
Precipitation: None

Station: BMB- 008
17T0593766 4826353
Date: June 1, 2015
Start Time: 8:27 a.m.
Observers: NG, M /NG, C

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Horned Lark		••	S			
Common Grackle	••	••	CF			
Killdeer		-	H			
Redwing blackbird		••	CF			
E. Starling		3	CF			
A. Robin		•	S			
Ring billed gull		••	X			
D. Goldfinch		•	H			

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:
Parked in front of gate at Lot 8305

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Station: BMB-009

Project #: 1624
Project Name: Halton Hills

Weather:

Visit 1

Wind speed:
Cloud cover: %
Air temp.: °C
Precipitation:

Date:
Start Time: a.m.
Observers:

Visit 2

Wind speed: 1 W Date: June 29/15
Cloud cover: 50 % Start Time: 825 a.m.
Air temp: 19 °C Observers: MG-BS
Precipitation: None

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Song Sparrow					5	S
Am Robin					5	FY
Blue Jay					5	S T
C. Yellowthroat					5	S
Willow Flycatcher					5	S
A. Goldfinch					5	S
Chipping Sparrow					5	S
N. Flicker					5	H
A. Crow					5	FT
Red-eyed Vireo					5	S
Brownheaded Cowbird					5	S
Red-winged Blackbird					5	S
Red-tailed Hawk					5	S
Gray Catbird					5	S
McCrory, Dave					5	S

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills
Station: BMB-002

Weather:

	Visit 1	Visit 2
Wind speed:		1 [illegible]
Cloud cover: %		40 %
Air temp.: °C		16°C °C
Precipitation:		None
Date:		June 29/15
Start Time:	a.m	7:46 a.m.
Observers:		[illegible]

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
White-breasted Nuthatch				•		S T
Savannah Sparrow				•		S T
Song Sparrow					•	S
N. Flicker					•	S
Black-capped Chickadee				•••		S
E. Kingbird					•	S T
A. Robin					•	S T
Rose-breasted Grosbeak					•	S T
A. Crow					•	S T
Red-winged Blackbird					••	S
Brown-headed Cowbird					••	P
N. Cardinal					•	S T

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Hutton Hills

Station: BMB- 003

Weather:

Visit 1		Visit 2	
Wind speed:	Date:	Wind speed: Tw	Date: June 24/15
Cloud cover: %	Start Time: a.m.	Cloud cover: 30 %	Start Time: 730 a.m.
Air temp.: °C	Observers:	Air temp: 19 °C	Observers: LM, JB
Precipitation:		Precipitation: None	

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Killdeer					1	H
Canada Goose					2	P
Mr. Mallard					1	H
R. Belted				1		H
A. Crow					1	H
A. Goldfinch					2	H
Blue Jay					1	H, T
Red-winged Blackbird				2	2	FY, P
Barn Swallow					2	H — T
A. Robin					1	S
E. Kingbird					1	S
Spotted Sandpiper					1	S

Incidental species (>100m, before or after point count from plot vicinity):
N. Flicker

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1125
Project Name: Halton Hills

Station: BMB- 009

Weather:

Visit 1		Visit 2	
Wind speed:	Date:	Wind speed: 1 W	Date: June 24/15
Cloud cover: %	Start Time: a.m.	Cloud cover: 40 %	Start Time: 0715 a.m.
Air temp.: °C	Observers:	Air temp: 17 °C	Observers: [illegible]
Precipitation:		Precipitation: None	

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Barn Swallow				2	1	H T
Cedar Waxwing					1	S
A. Robin				1	1	S T
Song Sparrow				1		S
Yellow Warbler				1		S
Brown-headed Cowbird					1	S T
Chipping Sparrow					1	S
E. Kingbird					1	S T
E. Starling					2	S T
A. Crow					1	H T
Warbling Vireo					1	S T
C. Grackle					2	H, P
Red-winged Blackbird				2	1	P

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1678
Project Name: Halton Hills

Station: BMB- 005

Weather:	Visit 1	Visit 2
Wind speed:	Date:	Wind speed: 1 W Date: June 29/15
Cloud cover: %	Start Time: a.m.	Cloud cover: 30 % Start Time: 0609 a.m.
Air temp.: °C	Observers:	Air temp: 17 °C Observers: NoM, JBB
Precipitation:		Precipitation: None

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
E. Wood Pewee					1	S, T
A. Goldfinch					1	S
E. Bluebird				2		FY, S
House wren					1	S, T
A. Robin					1	S, T
Song Sparrow					1	S
Downy Woodpecker					1	S
E. Phoebe					1	S
Rose-breasted Grosbeak					1	S
Black-capped chickadee					1	S, T

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Station: BMB- 006

Project #: 1624

Project Name: Hatton BBS

Weather:	Visit 1	Visit 2 (circled)
Wind speed:	Date:	Wind speed: 1 W · Date: June 29/15
Cloud cover: %	Start Time: a.m	Cloud cover: 90 % · Start Time: 0650 a.m.
Air temp.: °C	Observers:	Air temp: 18 °C · Observers: [illegible]
Precipitation:		Precipitation: None

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Indigo Bunting					••	S T
Song Sparrow					•	S T
N. Cardinal				•	•	S
Blue Jay					•	H T
E. Wood Pewee					•	S
A. Robin					•	S T
Gray Catbird				•		S
A. Goldfinch				••		P

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 162
Project Name: Halton Hills

Station: BMB- 007

Weather:	Visit 1	Visit 2
Wind speed:	Date:	Wind speed: 1-2 W Date: June 29/15
Cloud cover: %	Start Time: a.m.	Cloud cover: 30 % Start Time: 0645 a.m.
Air temp.: °C	Observers:	Air temp: 16 °C Observers: NBH, BB
Precipitation:		Precipitation: None

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Savannah Sparrow				3	2	H T
Red-winged Blackbird				4	3	S
Brown-headed Cowbird					1	S
E. Starling					2	H T
* Barn Swallow					2	H T
C. Grackle					1	H T
A. Robin					2	S, CF
Mourning Dove					2	P
A. Goldfinch					1	H T

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:
* BARS foraging in field west of Trafalgar

Breeding Bird Monitoring

10 Minute Point Count
100m Plot Radius

Project #: 1624
Project Name: Halton Hills
Station: BMB- 008

Weather:	Visit 1	Visit 2
Wind speed:	Date:	Wind speed: 0 2 Date: June 24/15
Cloud cover: %	Start Time: a.m.	Cloud cover: 60 % Start Time: 0540 a.m.
Air temp.: °C	Observers:	Air temp: 19 °C Observers: MG, TB
Precipitation:		Precipitation: Rain

Wind Scale
0 Calm
1 Smoke drifts
2 Wind felt on face
3 Leaves in motion
4 Sm branches move
5 Sm trees sway
6 Lrg branches move
7 Whole trees in motion
8 Twigs break off, hard to walk
9 Light structural damage
10 Trees uprooted

Breeding Evidence Codes
Observed
X - No evidence of breeding
Possible
H - Suitable nesting habitat
S - Singing male
Probable
P - Pair
T - Permanent territory
D - Courtship or display
V - Visiting prob. nest site
A - Agitated behaviour or anxiety calls
B - Brood patch/cloacal protuberance
N - Nest building or excavation
Confirmed
DD - Distraction display
NU - Used nest or egg shell
FY - Fledged young
AE - Adults at occupied nest
FS - Faecal sac
CF - Carrying food
NE - Nest containing eggs
NY - Nest with young

Species Name	Visit 1 Number ≤50m	Visit 1 Number >50m	Visit 1 Breeding Ev.	Visit 2 Number ≤50m	Visit 2 Number >50m	Visit 2 Breeding Ev.
Savannah Sparrow				1	1	S
Horned Lark					2	S T
Blue Jay				1	2	CF
Red-winged Blackbird					2	CF
Black-capped Chickadee					1	S
Red-tailed Hawk					1	H
Barn Swallow					2	H
Song Sparrow					1	S
Mourning Dove					2	P
A. Robin				1	1	S T
A. Goldfinch					1	S T
Cedar Waxwing				1	1	S
Canada Goose					1	X

Incidental species (>100m, before or after point count from plot vicinity):

Comments / Wildlife Obs.:

Breeding Bird survey #1
June 1/15
N6M, N6C

Halton Hills Premier Gateway Secondary Plan

Monitoring Stations

Legend

- Subject Area
- Anuran Monitoring Station (ANR)
- Owl Monitoring Station (OWL)
- Highway
- Primary Road
- Secondary Road
- Watercourse

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624
Date: April 30, 2015

NAD83 - UTM Zone 17
Size: 11x17"
1:12,500

0 400 800 Metres

N

Anuran Call Survey

Field Data Forms

Halton Hills Gateway 1624
KSW, AME Apr. 16/15
Andrew Ecklestone

Nat. pocket adj. to far pond on golf course
yellow birch, r-o dogwd, cattail, Red-c gsn,
white cedar, willow sp. (w gall), phragmites

RWBL
AMRO

Owl Survey Wind 2-3 9°C 100% CC
OWL-001 @ ANR-004 Full protocol. No owls.
✓ Start: 20:29 12 min.

OWL-002 on Hornby NE side of Road @ speed
limit sign 17T 059~~2569~~ 482~~[illegible]~~
-3037 -5129
✓ Start: 21:27
~~Dir~~ No owls.

OWL-003 17T 0591837 4824359
Start 22:12 Btwn houses #8391 & 8399
✓ SPPE 3 calling from W & 1 AMTO.
∟far away No owls.

OWL-004 Start 10:34 pm 17T 0593542 4826573
✓ @ white picket fence NE side of Road

"Rite in the Rain"

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway — Project No. 1624

UTM: 17T 0592422 ~~4824180~~ (+5m) [redacted] 4824280

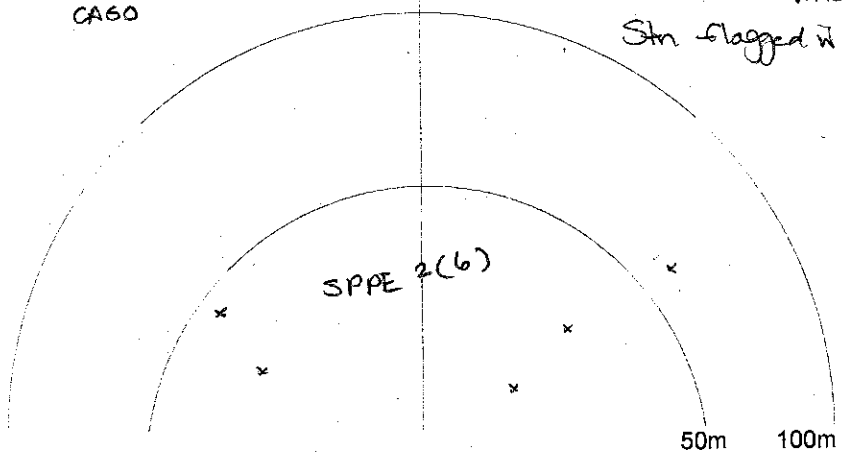
Observer: Katharina W, Andrew B.	Station Name: ANR-001 Visit #: 1		Date: Apr. 16 '15 Start time: 20:06	
Wind speed: 3	% Cloud cover: 100	Air Temp: 10°C	Water Temp: no access to pond	Water pH: -
Precipitation Description: none				
Remarks: Sunset @ 19:36.				

Birds: AMRO
RNBL
SOSP
KILL
CAGO

direction 240 °

No site access, so pond monitored from edge of golf course fence.

Stn flagged w pink



CALL LEVEL CODES		Beaufort Wind Scale		
1	Calls not overlapping; calling individuals can be counted	0 Calm	0-2	Smoke rises vertically
2	Calls somewhat overlapping; calling individuals can be counted	1 Light air	3 – 5	Smoke drifts, but wind vanes do not
3	Full chorus; number of calling individuals cannot be estimated	2 Slight breeze	6 – 11	Wind felt on face, leaves rustle
Enter as: Call code (# of ind.) e.g. 1 (2)		3 Gentle breeze	12 – 19	Leaves & small twigs in constant motion; light flags extended
		4 Mod. breeze	20 – 30	Wind raises dust and loose paper; small branches move
		5 Fresh breeze	31 – 39	Small trees in leaf begin to sway
		6 Strong breeze	40 - 50	Large branches in motion; inconvenience felt when walking against wind

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

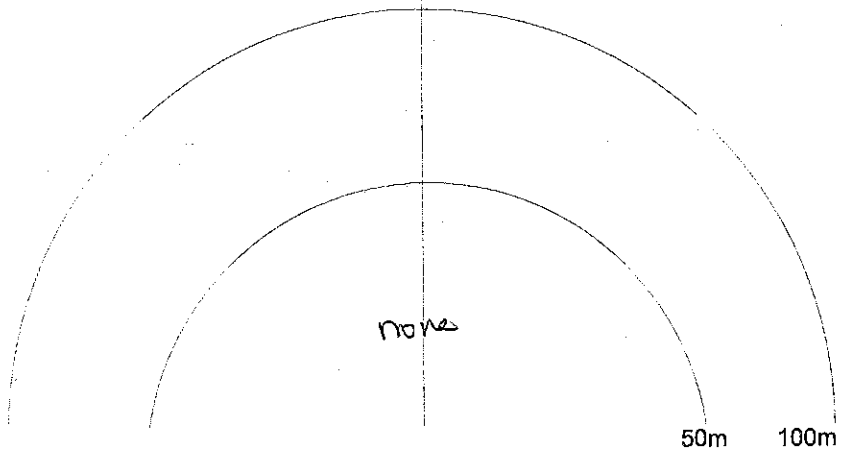
Project: Hatton Hills Gateway Project No. 1624

UTM: 17T 0592569 4824419

Observer: Katharina W Andrew E	Station Name: ANR-002 Visit #: 1		Date: Apr. 16/15 Start time: 20:12	
Wind speed: 3	% Cloud cover: 100	Air Temp: 10° C	Water Temp: 13.4	Water pH: 6.8
Precipitation Description: none				
Remarks: CAGO on pond (14) Brds: AMRO SOSP				

direction 270°

Stn @ stump @ edge of pond on E side



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Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624

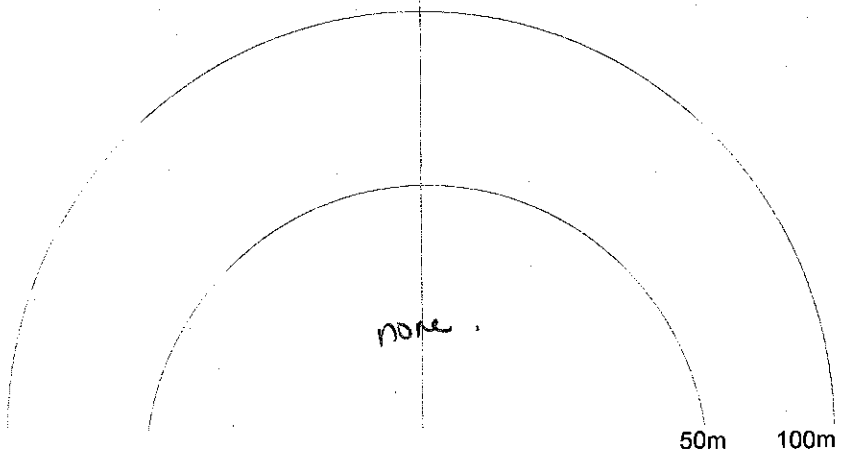
UTM: 17T ~~0592589 4824477~~ 592631 4824477

Observer:	Station Name: ANR-003		Date: Apr 16/15	
KSW, AME	Visit #: 1		Start time: 20:19	
Wind speed: 3	% Cloud cover: 100	Air Temp: 9°C	Water Temp: 11.7	Water pH: 7.0
Precipitation Description: none				
Remarks: Stn on S side of pond near trail, 3 CAGO on pond				

Brds: AMRO

direction 0 °

Pond trimmed w narrow-leaved cattails



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Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624

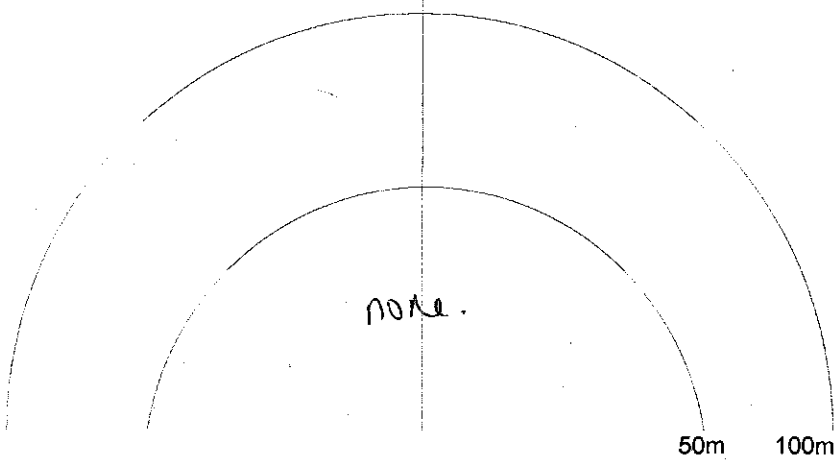
UTM: 17T ~~0592569 4824479~~ ~~592631~~ ~~4824479~~ 592861 4824820

Observer: KSW, AME	Station Name: ANR-004 Visit #: 1		Date: Apr 16/15 Start time: 20:28	
Wind speed: 3	% Cloud cover: 100	Air Temp: 10°C	Water Temp: 13.6	Water pH 7.2
Precipitation Description: none				
Remarks: OWL-001 @ this Stn.				

Brds: KILL
AMRO
CAGO

direction 100 °

Stn on W side of pond @ tree.



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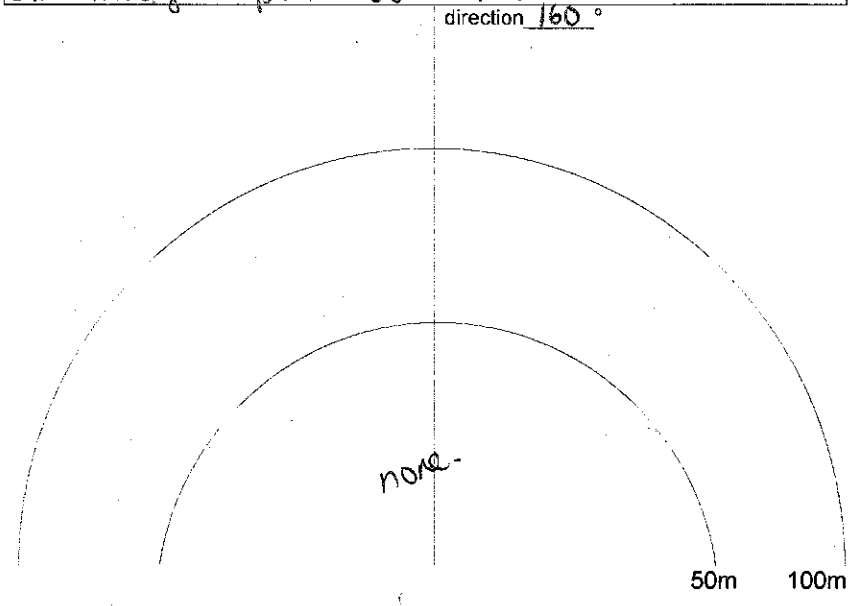
Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM: 17T ~~0592569 4824419~~ 592820 4824907

Observer:	Station Name: ANR-005 Visit #: 1		Date: Apr. 16/15 Start time: 20:47	
Wind speed: 3	% Cloud cover: 100	Air Temp: 9°C	Water Temp: 13.0	Water pH: 7.6
Precipitation Description: none				
Remarks: Stn @ NW edge of pond closest to trail.				



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✓

Amphibian Data Form

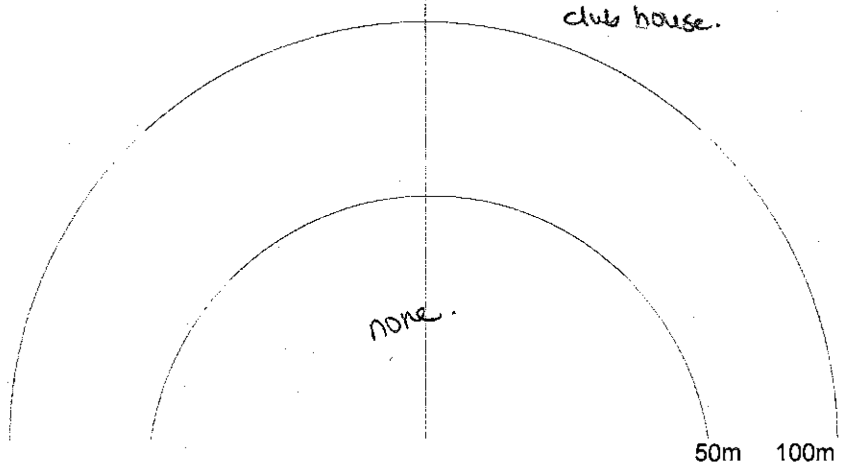
Project: Halton Hills Gateway Project No. 1624
UTM: 17T ~~[illegible]~~ 592766 4825115

Observer: KSW, AME	Station Name: ANR-006 Visit #: 1		Date: Apr 16/15 Start time: 20:55	
Wind speed: 3	% Cloud cover: 100	Air Temp: 9°C	Water Temp: 12.3	Water pH: 8.0
Precipitation Description: none				
Remarks: SPPE heard from very far away to N.				

direction 340°

Stn on S side of pond @ trees closest to club house

Nothing heard from small pond behind club house.



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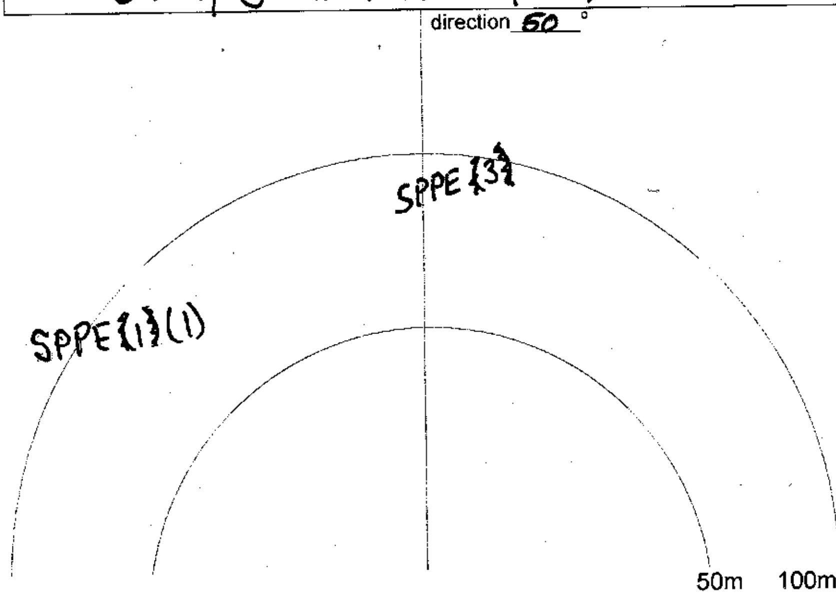
Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway   Project No. 1624
UTM: 17T KSW ~~0592569 4824419~~ 593191 4824973

Observer: AME/KATH	Station Name: ANR-007 Visit #: 1		Date: APR 16/15 Start time: 21:09	
Wind speed: 3	% Cloud cover: 100 %	Air Temp: 9 oC	Water Temp: 10.1	Water pH: 7.8
Precipitation Description: None				
Remarks: Survey @ Road near hydro pole (888)				

pH @ ditch near hydro pole



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Amphibian Data Form

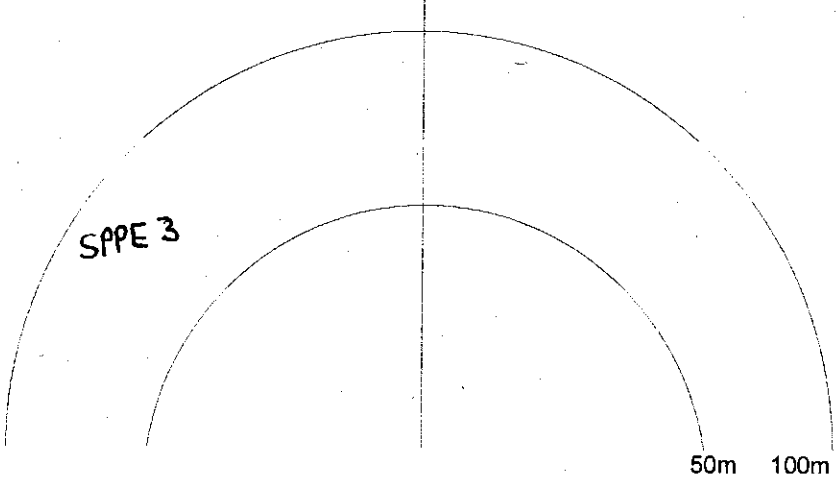
Project: Halton Hills Gateway Project No. 1624

UTM: 17T 0592357 4823833

Observer:	Station Name: ANR 008		Date: APR 16/15
AME / KSW	Visit #: 1		Start time: 22 05
Wind speed: 3	% Cloud cover: 100%	Air Temp: 9°C	Water Temp: 6.2 / Water pH: 8.2
Precipitation Description: None			
Remarks: Site adjacent to farm field driveway north of stream crossing; direction 250°			

pH taken @ ditch

* off site area



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ROUTE: start @ Steeles and N. on Trafalgar St.
TEMP: 13°C
DATE: APR 16, 2015.
TIME: 6:46 PM (START) / (END)
BIRD SPECIES
- Morning Dove
- American Crow
- Redwing Blackbird

FARM - NW corner of Steeles/Trafalgar
↳ could be Barn Swallows

FOREST: Halton Regional Forest.
↳ lines both sides of road.
↳ lots of deadwood

STREAM XING: Box culverts (2)
↳ south one: very small / narrow stream
↳ north one: larger running stream (~5-10m wide)

ROUTE: East on Steeles starting @ trafalger.
↳ Wetland: Northeast corner of Steeles and Trafalger (very small)
↳ observed Redwing blackbirds
ROUTE: N on Eighth line ↳ starting @ steeles.
↳ Cemetary on NE corner @ Eight Line & Trafalger (Hornsby)

↳ fields types marked on map.
↳ corn fields @ south
↳ soya beans to North.

- Redwng Blackbirds

ROUTE:

South on Hornby starting @ Trafalgar

FOREST
↳ Halton Region, on East side of road

GOLF COURSE (Hornby Glen)
↳ on West side of road
↳ Entrance.

POND
↳ 1/2 way down road on East side.

ROUTE
- West on Steeles starting @ Hornby

BIRD
SPASTURE/BARN (near stream XING)
↳ Bobolink / possible barn swallows
- Canada Goose observed.
↳ Gulls
TAMURAN
Lots of [illegible] on East side of road.

ROUTE:
North on Sixth line
starting @ Steeles

BIRDS - song sparrow
- Great Blue Heron - Canada Goose
- American Robin.

ANURAN
- Peeper on ~~East~~ West side of road (3)

FOREST -
↳ lots of dead wood in forest on West side of road
↳ more mature forest.

NO STICK NESTS OBSERVED ANYWHERE

GOLF COURSE

BIRDS
- Redwing Blackbirds

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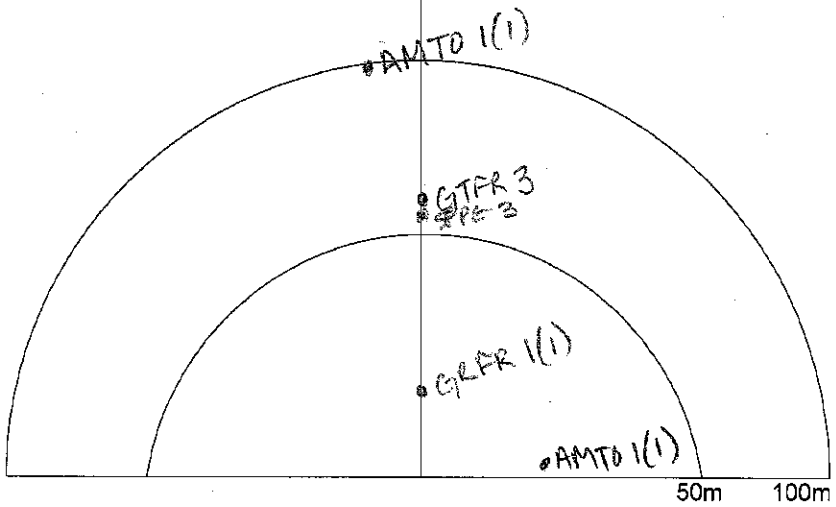
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624
UTM: 0592573 4824415

Observer:	Station Name: ANR-001 Visit #: 2		Date: May 18/15 Start time: 21:48	
Wind speed: 2	% Cloud cover: 100	Air Temp: 23°C	Water Temp: 24.5°C	Water pH: 8.7
Precipitation Description: NONE				
Remarks:				

direction 240°



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AMTO = American Toad.
GTFR = Gray Tree Frog.
SPPE = Spring Peeper.
GRFR = Green Frog.

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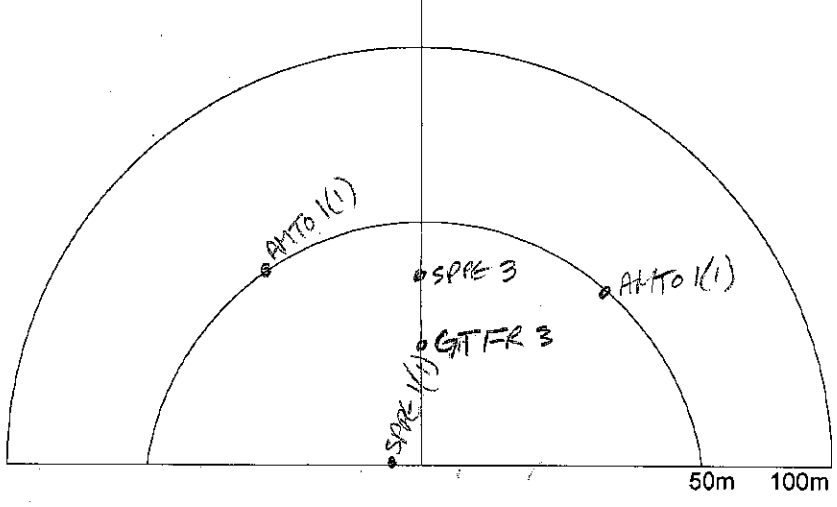
Amphibian Data Form

Project: HALTON HILLS GREENWAY SP. Project No. 1624
UTM: 0592412 4824291

Observer: AMC / CJC.	Station Name: ANR-002 Visit #: 2		Date: May 18/15 Start time: 21:58	
Wind speed: 2	% Cloud cover: 100	Air Temp: 23°C	Water Temp: N/A	Water pH: N/A
Precipitation Description: NONE				
Remarks: fireworks in distance				

direction 270°



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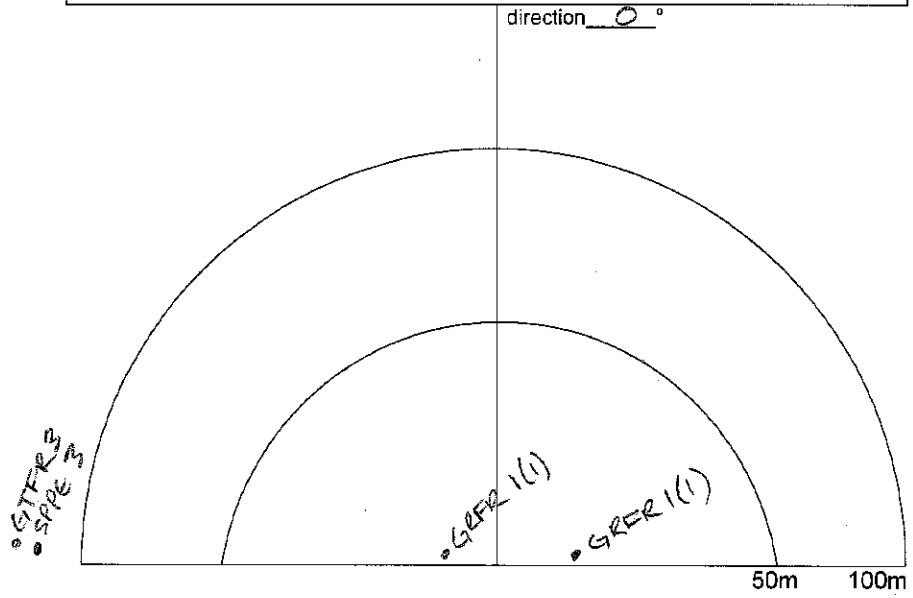
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624
UTM: 0592683 4824477

Observer:	Station Name: ANR-003 Visit #: 2		Date: May 18/15 Start time: 21:42	
Wind speed: 2	% Cloud cover: 100	Air Temp: 23°C	Water Temp: 23.1°C	Water pH: 8.5
Precipitation Description: NONE				
Remarks: Canada Geese in pond.				

direction 0 °



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GTFR = GRAY TREE FROG.
SPPE = SPRING PEEPER.
GRFR = GREEN FROG.
AMTO = AMERICAN TOAD.

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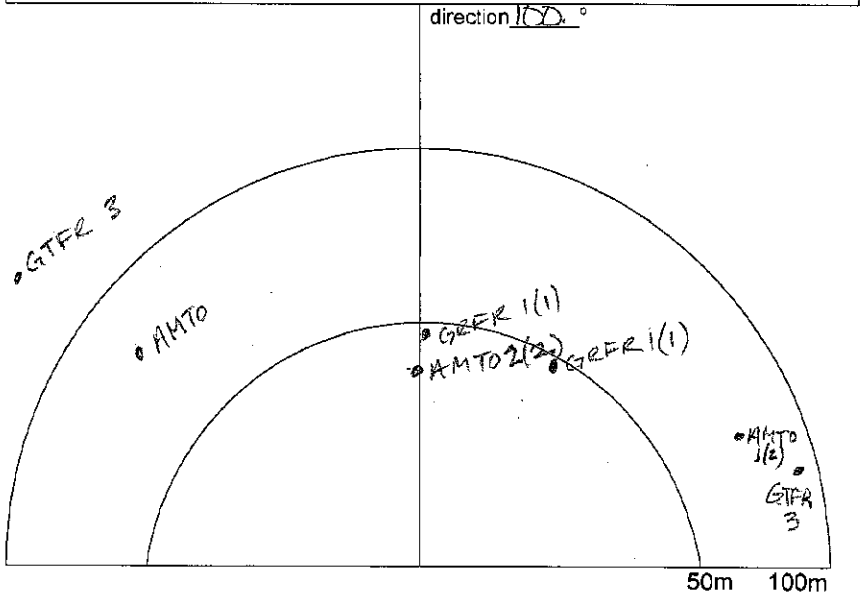
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624
UTM: 0592863 4824809

Observer: AMC / CJC	Station Name: ANR004 Visit #: 2		Date: May 18/15 Start time: 21:23	
Wind speed: 2	% Cloud cover: 100	Air Temp: 23°C	Water Temp: 24.4°C	Water pH: 7.9
Precipitation Description: none				
Remarks:				

direction 100 °



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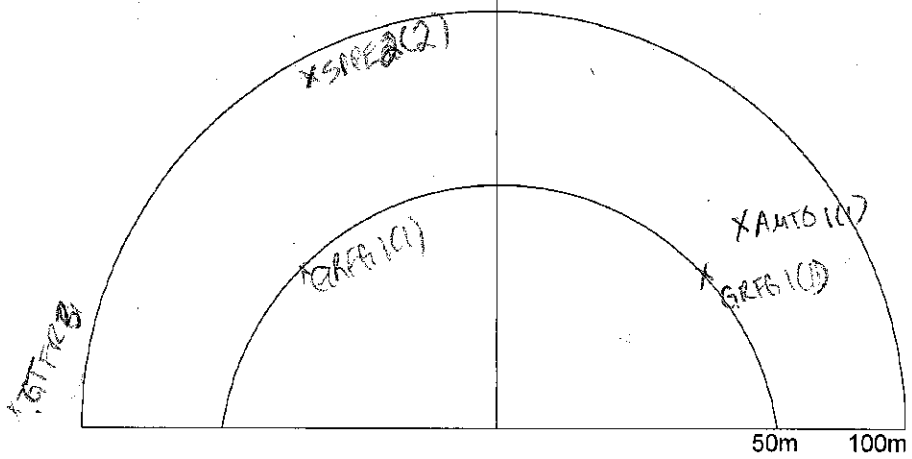
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624

UTM: 17T 0592030 4824910

Observer:	Station Name: ANR-005 Visit #: 2		Date: MAY 18, 2015 Start time:	
Wind speed: 2	% Cloud cover: 100	Air Temp: 23°C	Water Temp: 23.0°C	Water pH: 8.4
Precipitation Description: NONE				
Remarks: PAIR FLYING OVER HEAD, KILLDEER PRESENT, FIREWORKS AGAINST @ 21:35				

direction 160°



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SPEE: SPRING PEEPER
GRFG: GREEN FROG
GTFR: GRAY TREE FROG
AMTO: AMERICAN TOAD

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Aquatic, Terrestrial and Wetland Biologists

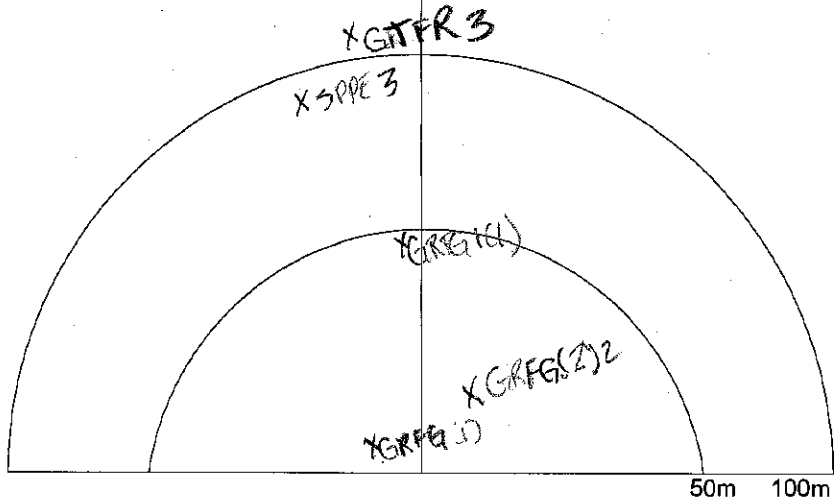
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624

UTM: 0592816 4825154

Observer: AMC / CTC	Station Name: ANR-006 Visit #: 2		Date: MAY 18, 2015 Start time: 21:08	
Wind speed: 2	% Cloud cover: 95	Air Temp: 23°C	Water Temp: 22.9°C	Water pH: 8.2
Precipitation Description: none				
Remarks:				

direction 340°



CALL LEVEL CODES		Beaufort Wind Scale		
1	Calls not overlapping; calling individuals can be counted	0 Calm	0-2	Smoke rises vertically
2	Calls somewhat overlapping; calling individuals can be counted	1 Light air	3 – 5	Smoke drifts, but wind vanes do not
3	Full chorus; number of calling individuals cannot be estimated	2 Slight breeze	6 – 11	Wind felt on face, leaves rustle
Enter as: Call code (# of ind.) e.g. 1 (2)		3 Gentle breeze	12 – 19	Leaves & small twigs in constant motion; light flags extended
		4 Mod. breeze	20 – 30	Wind raises dust and loose paper; small branches move
		5 Fresh breeze	31 – 39	Small trees in leaf begin to sway
		6 Strong breeze	40 - 50	Large branches in motion; inconvenience felt when walking against wind

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

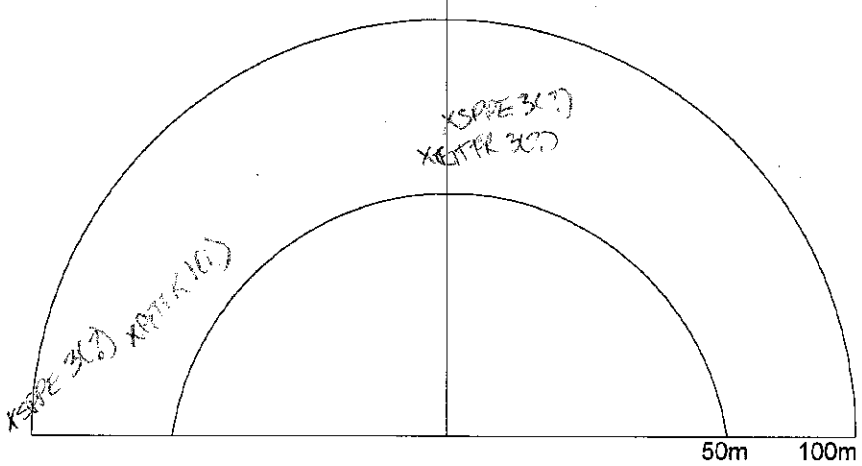
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624

UTM: 0593207 4824989

Observer:	Station Name: ANR-007 Visit #: 2		Date: 2 Start time: 22:27	
Wind speed: 1	% Cloud cover: 90	Air Temp: 23°C	Water Temp: NA	Water pH: NA
Precipitation Description: NONE				
Remarks:				

direction 50 °



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SPPE = SPRING PEEPER.

GTFR = GRAY TREE FROG.

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Aquatic, Terrestrial and Wetland Biologists

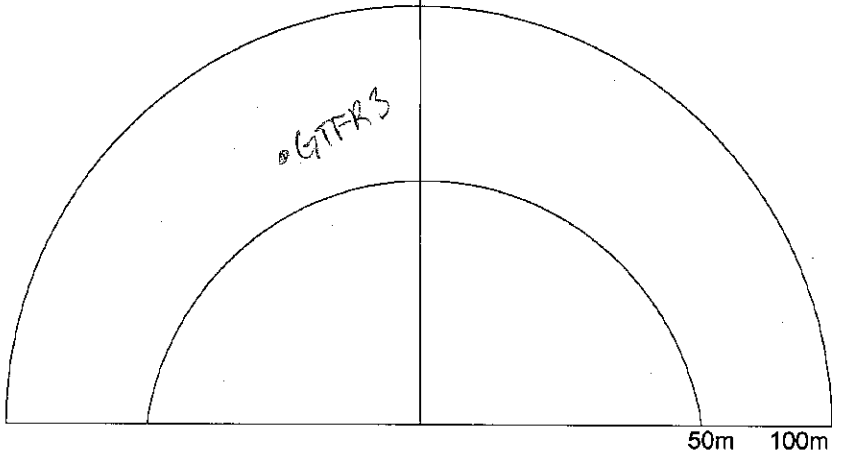
Amphibian Data Form

Project: HALTON HILLS PREMIER Project No. 1624

UTM: 0592859 4823835

Observer: AMC / CJC	Station Name: ANR-008 Visit #: 2		Date: May 14/15 Start time: 22:39	
Wind speed: 2	% Cloud cover: 90	Air Temp: 23°C	Water Temp:	Water pH:
Precipitation Description: NONE				
Remarks:				

direction 250 °



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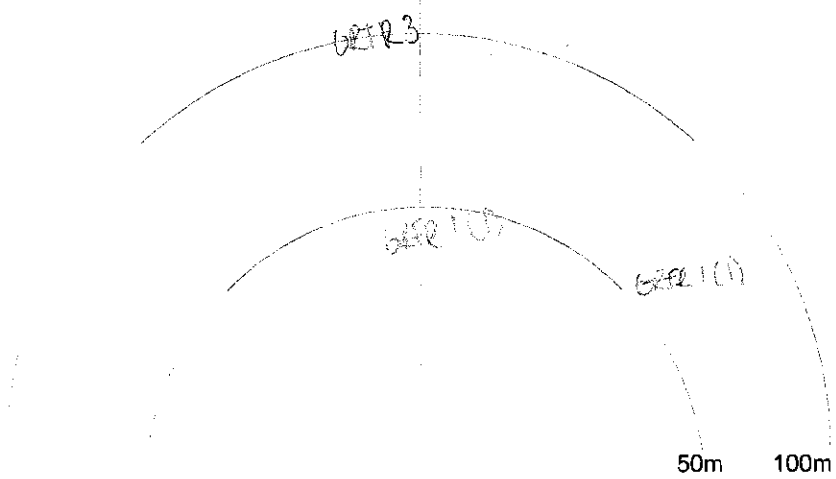
Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer: CJC VLR	Station Name: ANR-002 Visit #: 3		Date: June 16 15 Start time: 22.32	
Wind speed: 1	% Cloud cover: 0	Air Temp: 21	Water Temp: 20.1	Water pH: 8.6
Precipitation Description: NONE				
Remarks:				

direction 210 °



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GRTR = Gray Treefrog
GRFR = Green Frog
SPPE = Spring Peeper

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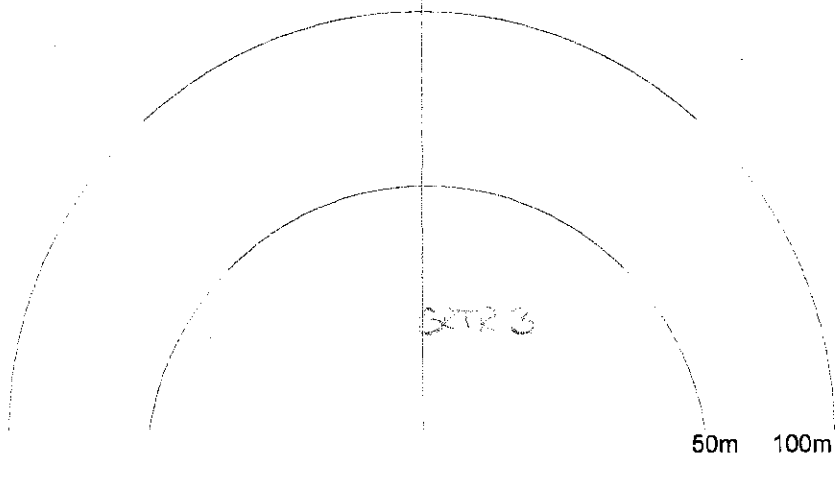
Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer: CJC VLR	Station Name: ANR-001 Visit #: 3		Date: June 16 15 Start time: 22 39	
Wind speed: 1	% Cloud cover: 0	Air Temp: 21	Water Temp: —	Water pH: —
Precipitation Description: NONE				
Remarks:				

direction 200 °



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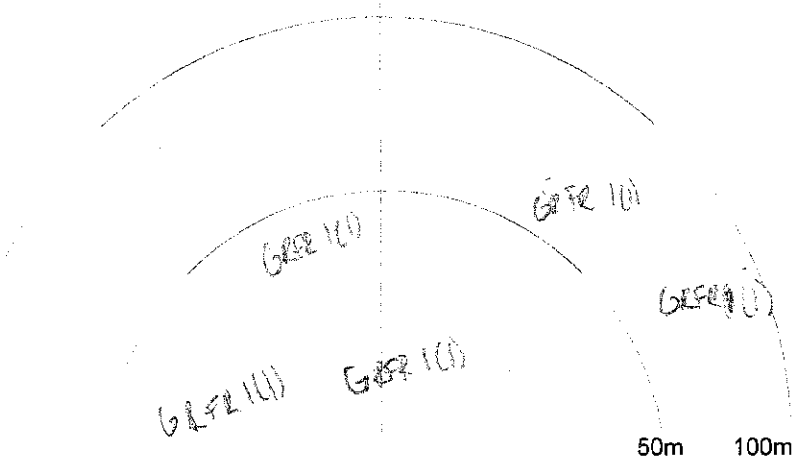
Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer: CJC / VLR	Station Name: ANR-004 Visit #: 3		Date: June 16/15 Start time: 22:10	
Wind speed: 1	% Cloud cover: 0	Air Temp: 21	Water Temp: 24.2	Water pH: 6.7
Precipitation Description: NONE				
Remarks:				

direction 70 °



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GRTR = Gray Treefrog
GRFR = Green Frog
SPPE = Spring Peepers

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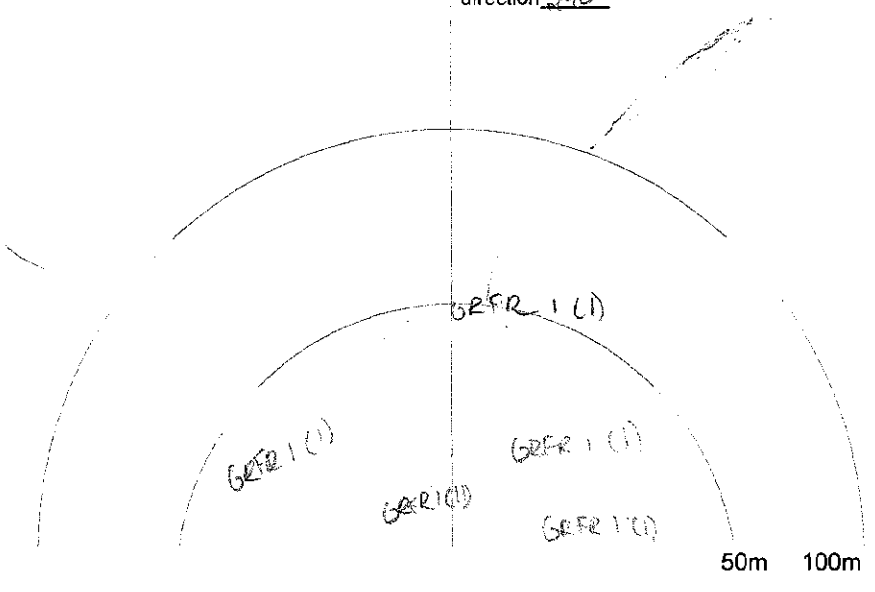
Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer: CJC / VLR	Station Name: ANR-003 Visit #: 3		Date: June 16/15 Start time: 2025	
Wind speed: 1	% Cloud cover: 0	Air Temp: 21	Water Temp: 22.5	Water pH: 8.2
Precipitation Description: NONE				
Remarks:				

direction 290 °



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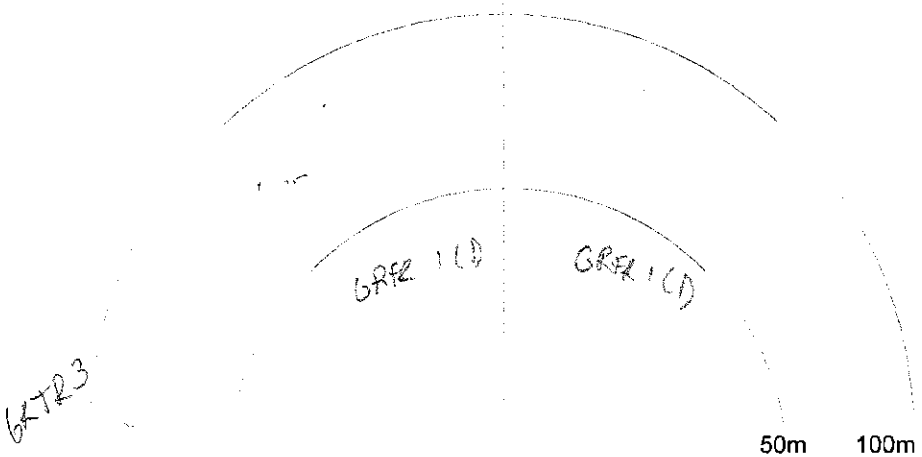
Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer:	Station Name: NR-005 Visit #: 3		Date: June 16/15 Start time: 2208	
Wind speed:	% Cloud cover: 0	Air Temp: 21	Water Temp: 22.7	Water pH: 8.1
Precipitation Description: NONE				
Remarks:				

direction 100 °



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GRFR- Green Frog
GRTR- Gray Treefrog

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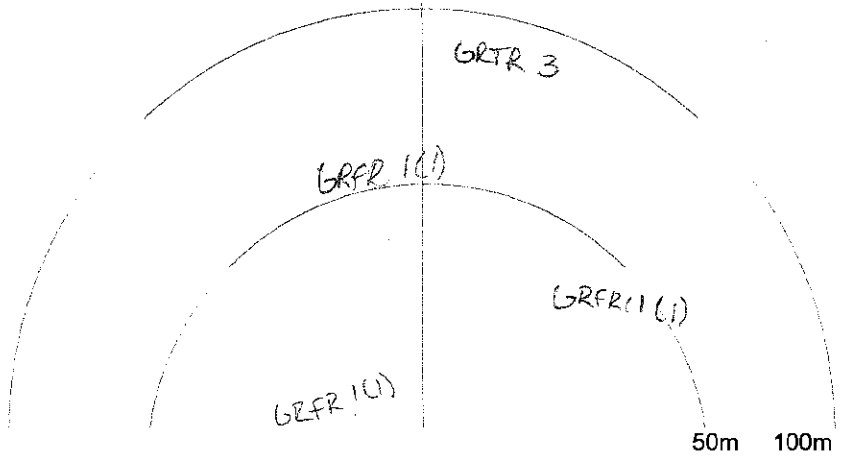
Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM:

Observer: CJC/VLR	Station Name: NR-006 Visit #: 3		Date: June 16/15 Start time: 2159	
Wind speed: 1	% Cloud cover: 0	Air Temp: 21	Water Temp: 23.5	Water pH: 7.6
Precipitation Description: None				
Remarks:				

direction ____ °



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		6 Strong breeze	40 - 50	Large branches in motion; inconvenience felt when walking against wind

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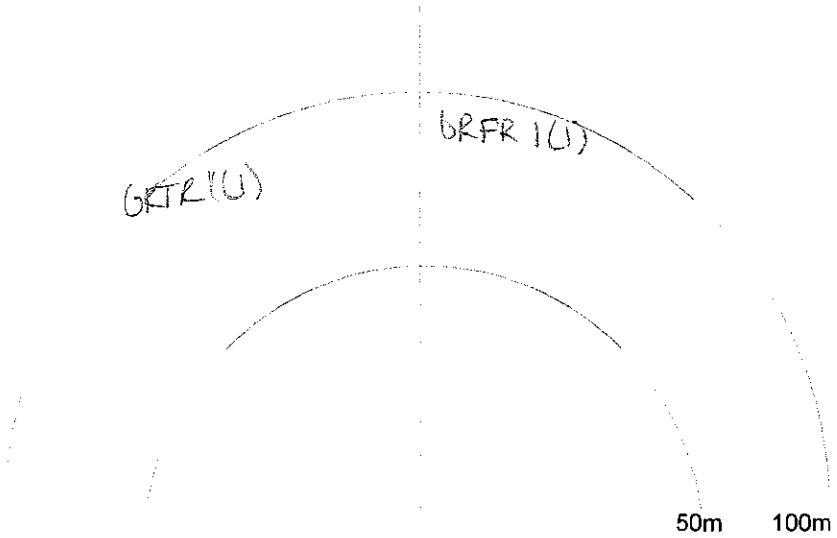
Aquatic, Terrestrial and Wetland Biologists

Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM: 6592189 4624972

Observer:	Station Name: ANR-005		Date: June 16/15
CSC / VLR	Visit #: 3		Start time: 2149
Wind speed:	% Cloud cover:	Air Temp:	Water Temp: — / Water pH: —
1	Ø	21	
Precipitation Description: NONE			
Remarks: TRAFFIC NOISE FAIRLY HEAVY DURING SURVEY			

direction 50 °



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GRTR = gray treefrog
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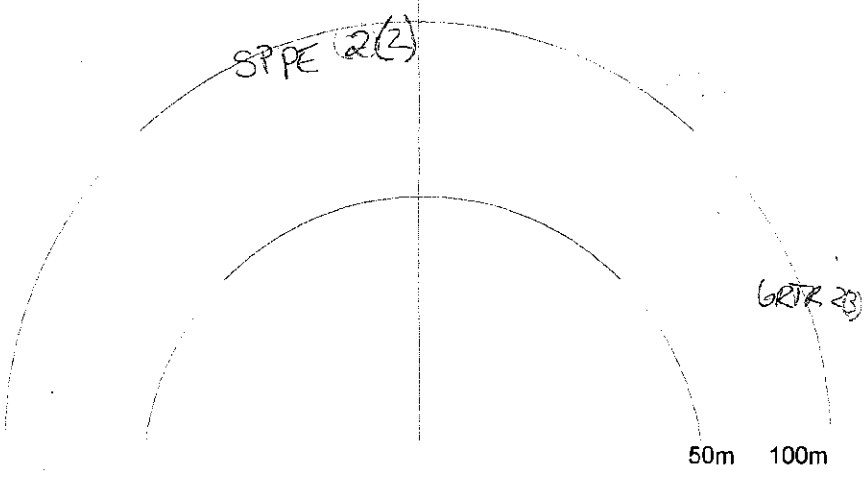
Amphibian Data Form

Project: Halton Hills Gateway Project No. 1624
UTM: 6592361 4623516

Observer:	Station Name: ANR-006		Date: June 16/15
CSC / VLR	Visit #: 3		Start time: 21:39
Wind speed:	% Cloud cover:	Air Temp:	Water Temp: — / Water pH: —
1	Ø	21	
Precipitation Description: NONE			
Remarks: 5 or 6 Big Brown Bats			

direction 260 °



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Map 1

Halton Hills Premier Gateway Secondary Plan

Existing Conditions

Legend

- Subject Area
- Highway
- Primary Road
- Secondary Road
- Watercourse
- Wetland (Non-PSW)
- Wooded Area
- Natural Heritage Area

x Owl

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Aquatic, Terrestrial and Wetland Biologists

Project: 1624
Date: April 06, 2015

NAD83 - UTM Zone 17
Size: 11x17"
1:12,500

0 400 800 Metres

N

Halton Hills Premier Gateway Secondary Plan

Monitoring Stations

Legend

- Subject Area
- Anuran Monitoring Station (ANR)
- Owl Monitoring Station (OWL)
- Highway
- Primary Road
- Secondary Road
- Watercourse

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: April 30, 2015	NAD83 - UTM Zone 17 Size: 11x17" **1:12,500**

0 400 800 Metres

N

Other Wildlife Surveys

Field Data Forms

Crop from 2014
Stations. ANR-001 to 008
OWL-001 to 004

Apr. 16/15
KSW, AME

Map 1

Halton Hills Premier Gateway Secondary Plan

Field Map - South

Legend

- Subject Area
- Primary Road
- Secondary Road
- Watercourse

N

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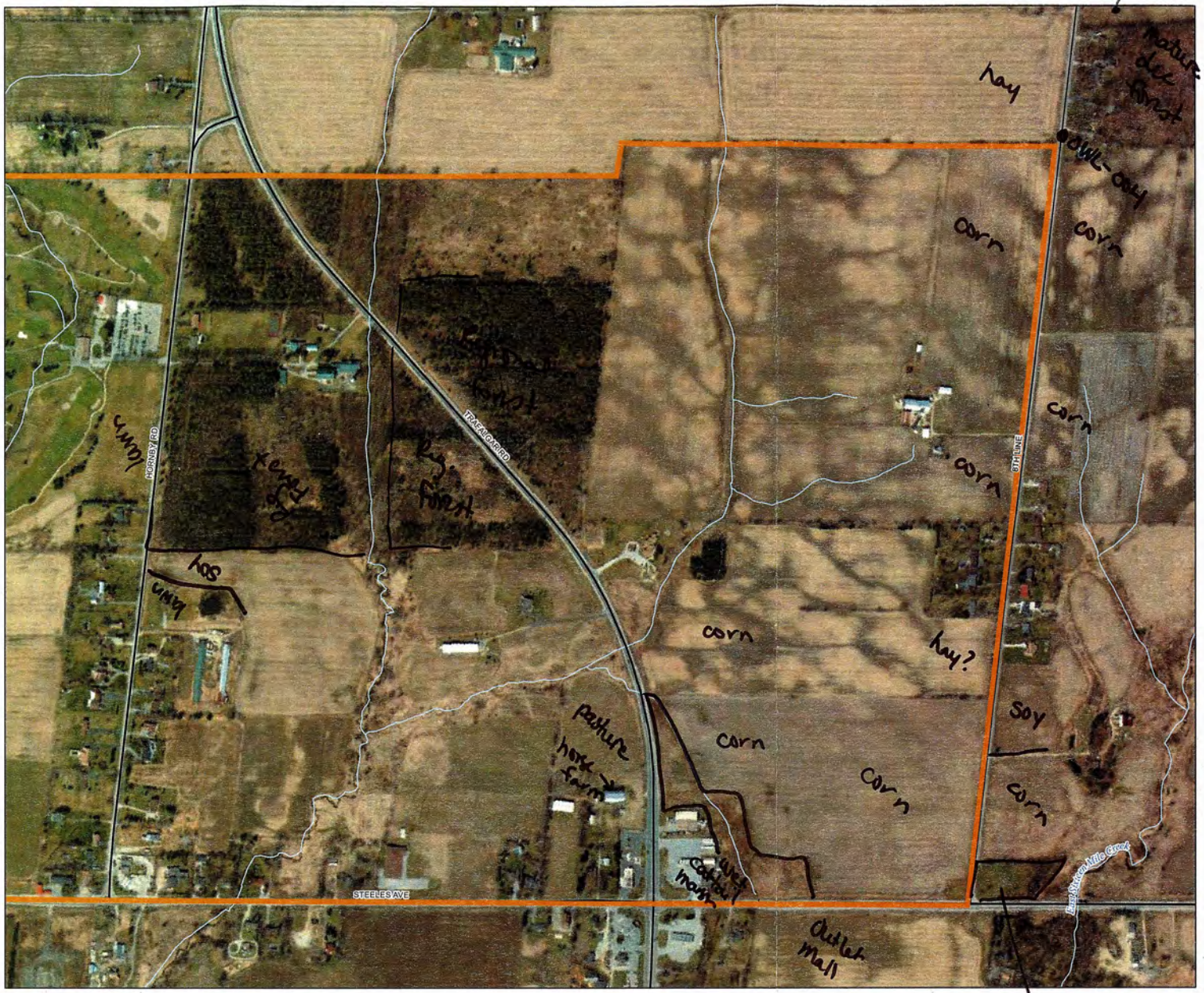
Project: 1624 Date: April 06, 2015	NAD83 - UTM Zone 17 Size: 11x17" 1:8,000

0 200 400 Metres

Crop from 2014.



Map 2

Halton Hills Premier Gateway Secondary Plan

Field Map - North

Legend

- Subject Area
- Primary Road
- Secondary Road
- Watercourse

N

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Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: April 06, 2015	NAD83 - UTM Zone 17 Size: 11x17" 1:6,000

0 200 400 Metres

Halton Hills Sec. Plan #1624
May 9/15 N6M, AMN
Photo Log: Pg 1/2

#2507-2509: Polygon 1 cultural Meadow at Hope Mens Recovery centre

#2510-2511: Grassy Field w E. Meadowlark/Bobolink
#2515-2516

#2512-2514: Polygon 2 Conifer plantation

#2516-2518: Cattail Marsh adj. to Trafalgar Polygon 1

#2519: Deciduous Hedgrow North of Steeles

#2520-2521: Polygon 3 - Golf Course Swamp feature

#2523-2525: Polygon 4 SWMM near back pond

#2526-2528: Polygon 5 west of Golf Course

#2529-2531: Bat cavity

#2534-2536: Polygon 6 Halton Forest
2537-2539, 2544-2546, 2548-2549

#2541-2543: Polygon 8 Halton Forest

Pg 2/2

#2550-2551 : Polygon 1 stream corridor

Halton Hills Secondary Plan #1624

SWH/SAR/SCC Notes NGM, AMD May 4/15

Bobolink - heard singing in polygon #1, possible breeder within grassy field near Steeles + Trafalgar. (clover/Hay)

Barn Swallow - foraging in agr. fields near Hope Building. Polygon OAG/2

Cavity Tree - large Sugar Maple ≈ 100cm
- large cavity ≈ 8m up
- within Woodland east of Golf Course
- UTM: 17T 0592038 4824586
(Polygon 5)

Butternut Trees - 3 dead butternut trees
- UTM: 17T 0591307 4825562
Polygon 6

pg 1/1

Bird and Wildlife Area Search Observation Form	Project: Halton Hills Secondary Plan
	Project #: 1624
Date: May 4/15	Cloud Cover (%): 40
Time: 0935 L 1458	Temperature (°C): 21
Observer(s): NGM, AMP	Wind: 5 SW
Survey: ELC, Insects, Herpetofauna	Precipitation: None

Species	POLYGON NUMBERS - Record evidence by polygon										
	1	2	OAG	Golf	5	6	8				
Song Sparrow	••	•		•		••	•				
Blue Jay	••	••		•		•	•				
Tree Swallow	•					•					
R. Headed Cowbird	•			•							
Savannah Sparrow	••										
Barn Swallow*	•		•								
Red-winged Blackbird	••			••		••					
Great Blue Heron	•										
Northern Cardinal	•			•		•					
Bobolink*			•								
D. woodpecker	•	•			•	•					
A. Goldfinch	••					••					
E. Meadowlark			•								
Red-breasted Nuthatch		•									
Vesper Sparrow			•								
A. Robin	•			••		••	••				
A. Crow			•	•		•					
Coyote			•								
House Sparrow	••										
Horned Lark			•								
Raccoon			•								
E. Starling			••								
A. Toad				•							
Canada Goose											
D.C. Cormorant											
C. Grackle											
Brown Thrasher											
Painted Turtle											
Yellow warbler				•							
N. Flicker				•			•				
Mourning Dove				•			•				
Black-capped Chickadee					•	•	•				
E. Kingbird					•						
White-throated Sparrow					•						
Ruby-crowned Kinglet					•	•					
E. Phoebe						•					
Yellow-rumped Warbler											

Bird and Wildlife Area Search Observation Form	Project:
	Project #:
Date: See pg 1	Cloud Cover (%):
Time:	Temperature (°C):
Observer(s):	Wind:
Survey:	Precipitation:

Species (**note: no codes)	POLYGON NUMBERS - Record evidence by polygon
	6
Palm Warbler	•
Red Admiral	•
White-breasted Nuthatch	•
Hairy Woodpecker	•
Flycatcher Sp.	•
Brewster's Warbler	•
Chipping Sparrow	•
Black & White Warbler	•
Herring Gull	•
Hermit Thrush	•
Cabbage White	•
Carolina Wren	•
Beaver pond Baskettail	•

NRSI Concentrated Reptile Search Effort Form

Date: May 4/15	Observers: NGM, AMD
Project Name and #: 1624 Halton Hills Secondary Plan	
Search Start Time (24hrs): 0935	
Search End Time (24hrs): 1438	

Habitat description/suitability (describe vegetation, attractive features, etc.)
See ELC mapping
Generally a mix of agr., golf courses, artificial ponds, streams, field, woodlands

Target Species (if applicable): Turtles, Snakes

Weather

Cloud cover (%): 40 – 90	Wind: 5	Air Temp (°C) start time: 21
Precipitation: None		Air Temp (°C) end time: 24

Search Method (canoeing, foot search, etc.): Area search. Scanned ponds with binoculars
Flipped debris

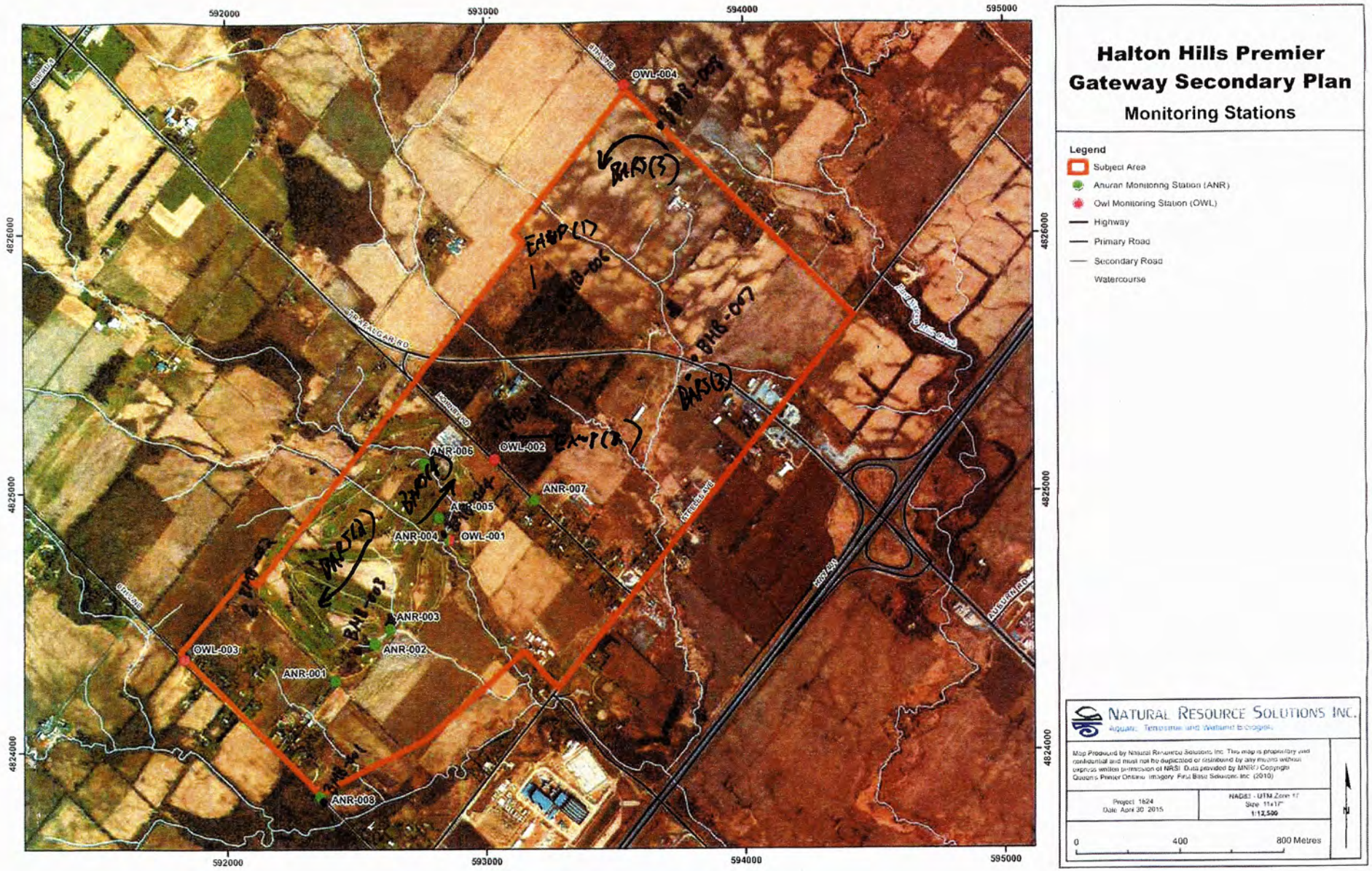
Reptile Species Detected

Species	Activity/Behaviour	Location	Water Temp (°C) (if applicaable)	# of Individuals
Midland Painted Turtle	Basking on shore of pond	Very back pond on golf course	N/A	5
No other reptiles observed during field visits on May 4/15				

Comments

*Draw route on map or record tracks on GPS

Breeding Bird survey
June 29/15 Nam, JBB
Significant species observations



Bird and Wildlife Area Search Observation Form	**Project:** Holtan Hills **Project #:** 1624
Date: June 29/15	Cloud Cover (%): 60
Time: 0615 – 0900 hrs	Temperature (°C): 19
Observer(s): NGM, JBB	Wind: 1-2 W
Survey: Insect: Odonate/Butterfly Area Search	Precipitation: None

Species (**note: no codes)	**POLYGON NUMBERS - Record evidence by polygon**											
No species observed												

NRSI Concentrated Reptile Search Effort Form

Date: June 29 2015	Observers: NGM, JBB
Project Name and #: 1624 Halton Hills	
Search Start Time (24hrs): 6:15	
Search End Time (24hrs): 8:45	
Habitat description/suitability (describe vegetation, attractive features, etc.) See ELC Mapping	
Target Species (if applicable):	

Weather

Cloud cover (%): 30	Wind: 0	Air Temp (°C) start time: 16
Precipitation: none.		Air Temp (°C) end time: 17

Search Method (canoeing, foot search, etc.):

Reptile Species Detected

Species	Activity/Behaviour	Location	Water Temp (°C) (if applicaable)	# of Individuals
no species obs.				

Comments

*Draw route on map or record tracks on GPS

Other Wildlife Detected

Species	Location	Evidence	Photo #(s)	# of Individuals
see breeding bird forms				

#1624 Halton Hills Gateway — September 1/15
Fall veg., Insects & Herpetofauna — NGM, CM
20-31°C, wind 2 5, C.C: 0%, no precip.

Wildlife observations: TAGM1 TAGM2 FOD7

- A. Gold finch ~~(TAGM3,~~ (TAGM2), Golf course)
- D. woodpecker (FOD 7) X
- Blue Jay (TAGM3, FOD7) X
- B.C. chickadee (TAGM3, ~~FOD7~~, FODMS-8)
- White-tailed deer (TAGM3
- E. Wood Pewee (TAGM2) FODMS-8,
- N. cardinal (TAGM2)
- Red-tailed Hawk (Golf)
- Monarch (Golf) - 1 adult, 1 caterpillar
- Ring-billed Gull (Golf)
- C. Grackle (Golf)
- C. Goose (Golf)
- E. Forktail (Golf)
- Blue Dasher (Golf)
- C. Green Darner (Golf)
- White-breasted Nuthatch (FODMS-8)
- Gray Squirrel (FODMS-8)
- Mourning Dove (Golf)C
- Black Saddle bags (Golf)
- Ruby-Throated Hummingbird (Golf)
- Painted Turtle (Golf) → see Herp Area search form
- Green Frog (Golf)

- widow Skimmer (Golf)
- Indigo Bunting (Golf course)
- Turkey vulture (OA6)
- Red-eyed vireo (FODMS-8)
- Cabbage white (OA6) - 4 individuals

Aquatic Habitat Assessment

Field Data Forms

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	Halton Premier Gateway 1B Study (Project 1624)				
Field Staff:	AME / AMC				
Station ID:	GOLF-1				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	700 m				
Survey Date:	MAY 28/2015	**Weather Conditions:**			
Time:	7:15 AM	Wind:	light	Cloud Cover (%):	15%
		Precipitation:	0	Air Temperature:	12°C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Grasses - overgrown on banks
		Jewelweed, Silver Maple, Garlic Mustard
		Manitoba Maple, Willow
	Vegetation Density (HML):	Grasses dominant - all other occasional
Canopy	Type:	Quality and % shade:

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	2.0	Wetted Width Range (m):	1.2	Gradient (H/M/L):	M
Bank Height (range (m)):	0.25			Meander/Straight:	
Bank Slope (degrees from surface of water):	50			Bank Stability:	Good - maintained

CHANNEL SUBSTRATE %

Clay:	0	Gravel:	30	Boulder:	0	Muck:	5
Silt:	10	Pebble:	10	Bedrock:	0	Detritus:	5
Sand:	40	Cobble:	10	Marl:	0	Other:	0

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y (low-@ high water)	Boulder/Rock:	
Riffles:	Y	Woody Debris:	Y (low)	Cobble:	
Backwater:	N	Vegetation:	Y	Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
sub- watercress		Occasional

GROUNDWATER

Evidence of Groundwater: Yes - watercress, no evidence of seepages
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):	13.7	D.O. (ppm):	0.87	pH: 8.36
Time Taken:	7:30	D.O. (%):	97%	TDS (ppm): DNC
Water depth: 0.1 - 0.6m		Conductivity (µs/cm):	0.73	
Flow: DNC				

Visible Characteristics/Other Parameters:

PHOTOS TAKEN

Photo #	Description	Photo #	Description
263	592605 4825182 (South)	266	592721 4825181 (N)
264	592569 4825178 (S)	267	592759 4815162 (N)
265	592668 4825176 (S)	268	592755 4825152 (N)
276	Intersect of Golf 1 + 2	269	592794 4825065 (S)
		275	- bottom of reach

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Fish - low abundance.
- Surrounded by golfcourse.
- Crayfish
- several "cart path" crossings
- Golfer / local indicated that groundwater ~~was~~ seep was located in property adjacent to North

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**		
Field Staff:	AME AMC		
Station ID:	GOLF 2		
GPS Datum:	NAD 1983		
Appr. Reach Length (m):	~470m		
Survey Date:	MAY 28 '15	**Weather Conditions:**	
Time:	8:35	Wind: light	Cloud Cover (%): 15%
		Precipitation: 0	Air Temperature: 14 °C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Grasses - overgrown + maintained. Willow
	Vegetation Density (HML):	LOW
Canopy	Type:	Quality and % shade:

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	NA	Wetted Width Range (m):	@ 1.5
Bank Height (range (m)):	0.05		
Bank Slope (degrees from surface of water):	20°		
Gradient (H/M/L):	L		
Meander/Straight:	Straight		
Bank Stability:	Good - maintained		

CHANNEL SUBSTRATE %

Clay:	NA	Gravel:		Boulder:		Muck:	100%
Silt:		Pebble:		Bedrock:		Detritus:	
Sand:		Cobble:		Marl:		Other:	Exposed

INSTREAM HABITAT AND COVER (Y/N)

Pools:	NA	Undercut Banks:	N	Boulder/Rock:	N
Riffles:	↓	Woody Debris:	N	Cobble:	N
Backwater:		Vegetation:	Y	Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
NA		
↓		

GROUNDWATER

Evidence of Groundwater:	NO
(e.g. watercress, rust staining, discharge):	NA

WATER QUALITY

Water Temp. (°C):	NA	D.O. (ppm):	pH:	Visible Characteristics/Other Parameters:
Time Taken:		D.O. (%):	TDS (ppm):	NA
Water depth: ↓ Flow):		Conductivity (µs/cm):		

PHOTOS TAKEN

Photo #	Description	Photo #	Description
270	592676 4824917 (S)	276	- Intersect of Golf 1 + 2 (N)
271	" " (N)	277	- bottom of reach (N)
272	592618 4824936 (N)		
273			
274	2 @ cartpath on S side		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Stream in culvert under fairways
- Creek was dry

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	AME / AMC				
Station ID:	GOLF 3				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~160m				
Survey Date:	MAY 28/15	**Weather Conditions:**			
Time:	9:00 AM	Wind:	NO	Cloud Cover (%):	10%
		Precipitation:	0	Air Temperature:	15oC

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Grass, Garlic Mustard, Willow, Buckthorn
	Vegetation Density (HML):	M
Canopy	Type:	Quality and % shade:

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	4m	Wetted Width Range (m):	2.1m	Gradient (H/M/L):	L
Bank Height (range (m)):	0.75m			Meander/Straight:	Meander
Bank Slope (degrees from surface of water):	45			Bank Stability:	Good

CHANNEL SUBSTRATE %

Clay:	—	Gravel:	30	Boulder:	—	Muck:	—
Silt:	20	Pebble:	10	Bedrock:	—	Detritus:	—
Sand:	30	Cobble:	10	Marl:	—	Other:	—

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y	Boulder/Rock:	N
Riffles:	Y	Woody Debris:	Y	Cobble:	Y
Backwater:	N	Vegetation:	Y	Other:	NA

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Grasses		

GROUNDWATER

Evidence of Groundwater: No - only where reach Golf 1 meets Golf 3
(e.g. watercress, rust staining, discharge): NA.

WATER QUALITY

Water Temp. (°C):	9.05	D.O. (ppm):	DNC	pH:	8.36
Time Taken:	13.7	D.O. (%):	DNC	TDS (ppm):	DNC
Water depth: 0.2-0.5m		Conductivity (µs/cm):	0.73		
Flow:	DNC				

Visible Characteristics/Other Parameters:

PHOTOS TAKEN

Photo #	Description	Photo #	Description
278	Upper section of reach (S)		
279	Upper section of reach (S)		
280 / 281	Mid section of reach		
282 / 283	Lower section of reach		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Fish observed
- Relatively large / wide section of creek
- 2 cart path crossings
- All H2O from Golf 1 reach

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**		
Field Staff:	AME AMC		
Station ID:	GOLF 4		
GPS Datum:	NAD 1983		
Appr. Reach Length (m):	~350 m		
Survey Date:	MAY 28/15	**Weather Conditions:**	
Time:	930	Wind: NO	Cloud Cover (%): 5%
		Precipitation: Ø	Air Temperature: 18°C

ADJACENT LANDS

Riparian Zone	Vegetation Type: - GRASSES	
	- Some shrubs in lower end	
	- Cattails between ponds	
	Vegetation Density (HML): M - Goldenrod in east branch	
Canopy	Type: Little from shrubs	Quality and % shade: Low/Sparse - 5%

CHANNEL MORPHOLOGY

Bankfull Width Range (m): NA	Wetted Width Range (m): NA	Gradient (H/M/L):
Bank Height (range (m)): NA		Meander/Straight:
Bank Slope (degrees from surface of water): NA		Bank Stability:

CHANNEL SUBSTRATE %

Clay:	Gravel:	Boulder:	Muck:
Silt: NA	Pebble: NA	Bedrock: NA	Detritus: NA.
Sand:	Cobble:	Marl:	Other:

INSTREAM HABITAT AND COVER (Y/N)

Pools: NA	Undercut Banks:	Boulder/Rock:
Riffles:	Woody Debris: NA	Cobble: NA.
Backwater: ↓	Vegetation:	Other:

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
NA		

GROUNDWATER

Evidence of Groundwater: NA
(e.g. watercress, rust staining, discharge): NA

WATER QUALITY

Water Temp. (°C):	D.O. (ppm):	pH:	Visible Characteristics/Other Parameters:
Time Taken: NA	D.O. (%): NA	TDS (ppm): NA	NA.
Water depth: ↓	Conductivity (µs/cm):		
Flow:			

PHOTOS TAKEN

Photo #	Description	Photo #	Description
284	Bottom of reach	293/94	- East branch of Golf 4 reach
287/88	West branch - near ponds	295	- mid section of east branch
290	- Standing pool		
291/92	- West branch inlet to pond		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Creek dry - especially lower section and east branch - Possible amphibian habitat
- Connected to ponds - Runs in culverts under fairways
- may be seasonal flow bt. ponds on west branch - little to no flow in east branch

DNC- Did Not Collect
NA- Not Applicable

285/286 Steeles looking

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	AME/AMC				
Station ID:	TRAFALGER 001				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~950m				
Survey Date:	MAY 28/15	**Weather Conditions:**			
Time:	1330	Wind:	light	Cloud Cover (%):	15%
		Precipitation:		Air Temperature:	27°c

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Meadow / agriculture	
	Vegetation Density (HML):	L	
Canopy	Type:	None	Quality and % shade: 0%

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	Wetted Width Range (m):	Gradient (H/M/L):
Bank Height (range (m)): 0.025		Meander/Straight:
Bank Slope (degrees from surface of water):		Bank Stability:

CHANNEL SUBSTRATE %

Clay:	NA	Gravel:	NA	Boulder:	NA
Silt:		Pebble:		Bedrock:	
Sand:		Cobble:		Marl:	
Muck:					
Detritus:	NA				
Other:					

INSTREAM HABITAT AND COVER (Y/N)

Pools:	NA	Undercut Banks:	NA	Boulder/Rock:	NA
Riffles:		Woody Debris:		Cobble:	
Backwater:		Vegetation:		Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
	NA	

GROUNDWATER

Evidence of Groundwater: NA
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):	D.O. (ppm):	pH:	Visible Characteristics/Other Parameters:
Time Taken: NA	D.O. (%):	TDS (ppm):	NA
Water depth:	Conductivity (µs/cm):		
Flow:			

PHOTOS TAKEN

Photo #	Description	Photo #	Description
318-321	Crossing @ Trafalger		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

Stream is dry.

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	AME / AMC				
Station ID:	Trafalger 002				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~1050 m				
Survey Date:	MAY 28 '15	**Weather Conditions:**			
Time:	1400	Wind:	0	Cloud Cover (%):	15% 2700
		Precipitation:	0	Air Temperature:	

ADJACENT LANDS

Riparian Zone	Vegetation Type:	DSH Meadow	
	Buckthorn OAK MAPLE		
	Vegetation Density (HML):		
Canopy	Type: Forest	Quality and % shade: Good - 75%	

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	6	Wetted Width Range (m):	5	Gradient (H/M/L):	L
Bank Height (range (m)):	1.1			Meander/Straight:	Meander
Bank Slope (degrees from surface of water):	80°			Bank Stability:	Good

CHANNEL SUBSTRATE %

Clay:	—	Gravel:	20	Boulder:	—	Muck:	—
Silt:	30	Pebble:	30	Bedrock:	—	Detritus:	—
Sand:	20	Cobble:	20	Marl:	—	Other:	—

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y	Boulder/Rock:	Y
Riffles:	Y	Woody Debris:	Y	Cobble:	Y
Backwater:	N	Vegetation:	Y N	Other:	N

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Algae on rocks		Occassional
Watercress on shoreline		Occasional (sparse)
None observed		

GROUNDWATER

Evidence of Groundwater: NO - some watercress along shoreline
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):	22.2	D.O. (ppm):	DNC	pH:	DNC	Visible Characteristics/Other Parameters:
Time Taken:	1400	D.O. (%):	105	TDS (ppm):	DNC	
Water depth: 0.05-0.5m		Conductivity (µs/cm):				
Flow: DNC						

PHOTOS TAKEN

Photo #	Description	Photo #	Description
322/23	South of Trafalger Rd		
324/25	North of Trafalger Rd		
326/27	~30m N of Trafalger		

GENERAL COMMENTS

Fish observed, unususal conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Fish observed
- Box culvert crossing @ Trafalger.
- low flow / gradient
- Small patches of watercress along shoreline.

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	HME IAMC				
Station ID:	STEELES 1				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~590m				
Survey Date:	MAY 28/15	**Weather Conditions:**			
Time:	9:40	Wind:	0	Cloud Cover (%):	5
		Precipitation:	0	Air Temperature:	15

ADJACENT LANDS

Riparian Zone	Vegetation Type:	- Grass - Agricultural	
	Vegetation Density (HML):	L	
Canopy	Type:	NA	Quality and % shade: NA

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	NA	Wetted Width Range (m):	NA	Gradient (H/M/L):	NA
Bank Height (range (m)):				Meander/Straight:	
Bank Slope (degrees from surface of water):				Bank Stability:	

CHANNEL SUBSTRATE %

Clay:		Gravel:		Boulder:		Muck:	
Silt:	NA	Pebble:	NA	Bedrock:	NA	Detritus:	NA
Sand:		Cobble:		Marl:		Other:	

INSTREAM HABITAT AND COVER (Y/N)

Pools:	NA	Undercut Banks:	NA	Boulder/Rock:	
Riffles:		Woody Debris:		Cobble:	NA
Backwater:		Vegetation:		Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
NA		

GROUNDWATER

Evidence of Groundwater:
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):		D.O. (ppm):	pH:	Visible Characteristics/Other Parameters:
Time Taken:	NA	D.O. (%): NA	TDS (ppm): NA	
Water depth: ↓		Conductivity (µs/cm):		
Flow:				

PHOTOS TAKEN

Photo #	Description	Photo #	Description
285/286	- Upper section of reach		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Completely dry
- Small buffer width

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	Halton Premier Gateway 1B Study (Project 1624)				
Field Staff:	AME / AMC				
Station ID:	STEELES 2				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~600m				
Survey Date:	MAY 28 /15	**Weather Conditions:**			
Time:	10AM	Wind:	Light	Cloud Cover (%):	0
		Precipitation:	0	Air Temperature:	17 °C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	- Meadow, grass, cultivated @ lower end ~~- Willow/Maple Buckthorn w/ grasses @ upper end~~	
	Vegetation Density (HML):	H	
Canopy	Type: None @ lower	Quality and % shade:	0 %

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	2	Wetted Width Range (m):	1.0	Gradient (H/M/L):	M
Bank Height (range (m)):	1.2			Meander/Straight:	Meander
Bank Slope (degrees from surface of water):	90° on R bank, 10° on L bank			Bank Stability:	O.K. (erosion @ corners)

CHANNEL SUBSTRATE %

Clay:		Gravel:	40	Boulder:	0	Muck:	0
Silt:	40	Pebble:		Bedrock:	0	Detritus:	0
Sand:	20	Cobble:		Marl:	0	Other:	0

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y (low)	Undercut Banks:	Y	Boulder/Rock:	N
Riffles:	Y	Woody Debris:	N	Cobble:	Y
Backwater:	N	Vegetation:	Y (low)	Other:	–

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Filamentous algae		Abundant
Watercress		Occassion

GROUNDWATER

Evidence of Groundwater: Yes
(e.g. watercress, rust staining, discharge): Watercress

WATER QUALITY

Water Temp. (°C):	20.2	D.O. (ppm):	DNC	pH: DNC	Visible Characteristics/Other Parameters:
Time Taken:	12:00	D.O. (%):	84.6%	TDS (ppm): DNC	
Water depth:		Conductivity (µs/cm):	DNC		
Flow:					

PHOTOS TAKEN

Photo #	Description	Photo #	Description
313/14	D/S end of Steeles-002		
315	D/S end " "		
316	North edge of Steeles-002		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Fish observed (large numbers)
- Surrounded in pasture
- Shallow/narrow section
- No cover, low laying
- Creek wider near top and gets narrower

DNC- Did Not Collect
NA- Not Applicable

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	AME/AMC				
Station ID:	STEELES # 3				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~650m				
Survey Date:	MAY 29/15	**Weather Conditions:**			
Time:	1115	Wind:	light	Cloud Cover (%):	5%
		Precipitation:	0	Air Temperature:	17 °C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Buckthorn, Willow, Meadow/grass, Hawthorn		Willow, Maple, Hawthorn	Buckthorn, grasses
	Vegetation Density (H/M/L):	L			
Canopy	Type:	L @ bottom, Tree canopy	Quality and % shade:	0% @ bottom	50% @ top all trees

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	5.5	Wetted Width Range (m):	1.7	Gradient (H/M/L):	L
Bank Height (range (m)):	1.5			Meander/Straight:	Meander
Bank Slope (degrees from surface of water):	60°			Bank Stability:	Good - erosion @ bends

CHANNEL SUBSTRATE %

Clay:	0	Gravel:	40	Boulder:	—	Muck:	—
Silt:	40	Pebble:	—	Bedrock:	—	Detritus:	—
Sand:	20	Cobble:	—	Marl:	—	Other:	—

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y	Boulder/Rock:	N
Riffles:	Y	Woody Debris:	Y (occasional)	Cobble:	Y
Backwater:	N	Vegetation:	Y (low abund)	Other:	—

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Grasses		Low
Filamentous Algae		Occasional

GROUNDWATER

Evidence of Groundwater: NO
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):	20.2	D.O. (ppm):	DNC	pH:	DNC
Time Taken:	12:15	D.O. (%):	85.7%	TDS (ppm):	DNC
Water depth:	0.1-0.3	Conductivity (µs/cm):	DNC		
Flow:	DNC				

Visible Characteristics/Other Parameters:

PHOTOS TAKEN

Photo #	Description	Photo #	Description
306/307	593116 4824040		
308/309	593118 4824117		
310/312	593138 4824129		
313	Upper Section (no access)		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Farmers pasture (accessible to livestock) @ bottom.
- Fish observed
- Top of Steeles 3

DNC- Did Not Collect
NA- Not Applicable

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Aquatic, Terrestrial and Wetland Biologists

AQUATIC HABITAT CHARACTERIZATION

PROJECT:	Halton Premier Gateway 1B Study (Project 1624)				
Field Staff:	STEELES 4				
Station ID:	AME1/AMC2				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	~630m				
Survey Date:	MAY 28/15	**Weather Conditions:**			
Time:	1020	Wind:	light	Cloud Cover (%):	0
		Precipitation:	0	Air Temperature:	15 °C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Grass, Willow, Buckthorn, Golden rod, Small Maples (Manitoba), Garlic Mustard, P. loosestrife, River Vine grape, Red O Dogwood	
	Vegetation Density (HML):	M	
Canopy	Type:	Willow	Quality and % shade: sparse - 10%

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	3m	Wetted Width Range (m):	3.5	Gradient (H/M/L):	L
Bank Height (range (m)):	1.5m			Meander/Straight:	small
Bank Slope (degrees from surface of water):	50°			Bank Stability:	Y (maintained)

CHANNEL SUBSTRATE %

Clay:	0	Gravel:	20	Boulder:	0	Muck:	0
Silt:	40	Pebble:	5	Bedrock:	0	Detritus:	0
Sand:	20	Cobble:	20	Marl:	0	Other:	0

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y (Minor)	Boulder/Rock:	Y
Riffles:	Y	Woody Debris:	Y (minor)	Cobble:	Y
Backwater:	N	Vegetation:	Y (Algae)	Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Filamentous algae		Abundant on cobble
Low instream veg		

GROUNDWATER

Evidence of Groundwater:	No
(e.g. watercress, rust staining, discharge):	NA

WATER QUALITY

Water Temp. (°C):	18	D.O. (ppm):	DNC	pH: DNC	Visible Characteristics/Other Parameters:
Time Taken:	10:25	D.O. (%):	92.6	TDS (ppm): DNC	
Water depth: 0.1 - 0.7		Conductivity (µs/cm):	DNC		
Flow: DNC					

PHOTOS TAKEN

Photo #	Description	Photo #	Description
296/97	Steeles @ top of reach	304	Upper section of reach
298/99	~100m S Steeles	305	Lower section of reach
300/01	05 near OBBN sites - mid reach		
	17593339 / 4824167		
302/03	17599791 / 4824101		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- crosses @ Steeles and 6th line S
- lower section appears to have more vegetated raparian (no access)
- Relatively large/wide section of creek
- No fish observed

DNC- Did Not Collect
NA- Not Applicable

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	AME/AMC				
Station ID:	STEELES 5				
GPS Datum:	NAD 1983				
Appr. Reach Length (m):	1500m				
Survey Date:	MAY 28/2015	**Weather Conditions:**			
Time:	1500	Wind:	0	Cloud Cover (%):	35 %
		Precipitation:	0	Air Temperature:	27 oc

ADJACENT LANDS

Riparian Zone	Vegetation Type:	Ash	Willow	P. lopsestrife
		Buckthorn	Meadowgrass	Golden rod
		Hawthorn	Ironwood	
	Vegetation Density (HML):	M		
Canopy	Type: Tree		Quality and % shade:	25% tree

CHANNEL MORPHOLOGY

Bankfull Width Range (m):	6.0	Wetted Width Range (m):	2.0	Gradient (H/M/L):	
Bank Height (range (m)):	1.0			Meander/Straight:	Meander
Bank Slope (degrees from surface of water):	45°			Bank Stability:	ok

CHANNEL SUBSTRATE %

Clay:	40	Gravel:	—	Boulder:	—	Muck:	
Silt:	40	Pebble:	10 mm	Bedrock:	—	Detritus:	
Sand:	~~100~~ 10	Cobble:	—	Marl:	—	Other:	

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y	Boulder/Rock:	N
Riffles:	Y	Woody Debris:	Y (lots)	Cobble:	Y
Backwater:	Y (log debris)	Vegetation:	N	Other:	

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
NA		
Some algea on rocks		Occasional
Grasses		Occasional

GROUNDWATER

Evidence of Groundwater: ND
(e.g. watercress, rust staining, discharge):

WATER QUALITY

Water Temp. (°C):	26.0	D.O. (ppm):	DNC	pH:	DNC
Time Taken:	1520	D.O. (%):	116.5%	TDS (ppm):	DNC
Water depth: 0.05-0.35m		Conductivity (µs/cm):	DNC		
Flow: DNC					

Visible Characteristics/Other Parameters:

PHOTOS TAKEN

Photo #	Description	Photo #	Description
328/329	594722 4825548		
330	594761 4825543		
331/332	594757 4825556		
333	U/S section of reach		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:

- Some fish observed
- Large amounts of woody debris creating backwater
- Small, narrow, low gradient system
- Could become intermittently dry

DNC- Did Not Collect
NA- Not Applicable

road lengths

Map 1

Halton Hills Premier Gateway Secondary Plan

Field Map - South

Legend

- Subject Area
- Primary Road
- Secondary Road
- Watercourse

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Aquatic, Terrestrial and Wetland Biologists

Project: 1624 Date: April 06, 2015	NAD83 - UTM Zone 17 Size: 11x17" 1:6,000

0 200 400 Metres

EVIDENCE of GROUND WATER

Map 1

Halton Hills Premier Gateway Secondary Plan

Existing Conditions

Legend

- Subject Area
- Highway
- Primary Road
- Secondary Road
- Watercourse
- Wetland (Non-PSW)
- Wooded Area
- Natural Heritage Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1624
Date: April 06, 2015

NAD83 - UTM Zone 17
Size: 11x17"
1:12,500

0 400 800 Metres

N

Benthic Sampling

Field Data Forms

Kill deer
Robin
Red winged BB

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS

Date: MAY 28, 2015
Time 07:16
Agency: NRSI.
Investigators: AMC.

Stream name:
Site #: BTH-001
SAMPLE 1: 592643/4825178
Location: centroid of 3 replicates, Lat/Long or UTM
S2: 592619 / 4825179
S3: 592632 / 4825181
Elevation (m asl):
Datum/zone: 17

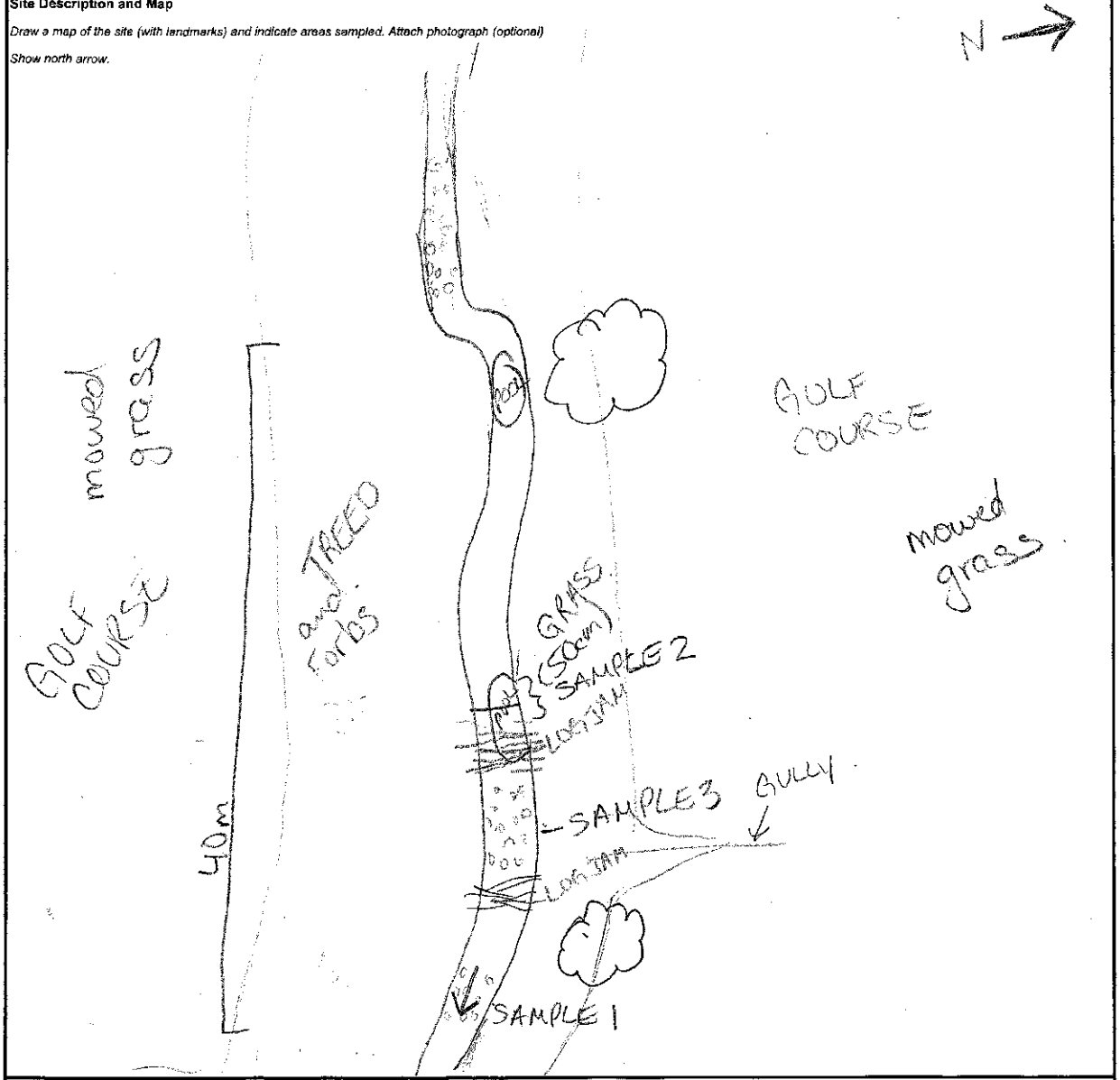
Water Quality
Water Temperature (°C): 13.7
DO (mg/l): 9.4 mg/L
Conductivity (uS/cm): 0.73
pH: 8.36
Alkalinity (mg/l as $CaCO_3$):

[redacted]

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):
Traveling Kick & Sweep • Grab Sample
• Other (specify):

Gear Type (circle one)
• D-net • Ponar • Other (specify):
• Ekman • Rock Baskets
Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)	10.0	3:17	0.015	1.2	15 mm	
Sample 2: Pool	10.0	3:02	0.013	1.2	5 mm	
Sample 3: Riffle (cross-over)	10.5	3:05	0.015	1.1	15 mm	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1 (RIFFLE 1)	Sample 2 (POOL)	Sample 3 (RIFFLE 2)
Dominant	3	2	3
2nd Dominant	2	3	2

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage

Use 1: Abundant, 2: Present, 3: Absent

	Sample 1	Sample 2	Sample 3
Woody Debris	3	2	2
Detritis	2	3	2

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's edge)	Left Bank	Right Bank (facing downstream)
1.5-10 m	2	5/? → TREES RIPARIAN COMMUNITY.
10-30 m	2	2
30-100 m	2	2

% Canopy Cover (circle one)

0-24 (25-49) 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	2	2
Rooted Floating	3	3	3
Submergent	3	2	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	3	3	3
Attached Algae	3	3	3
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): 2m Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- RUNS THROUGH GOLF COURSE.
- WATER CRESS PRESENT.

Candidate reference Site - Minimally Impacted? (circle one) Yes No

General Comments

- FISH SEEN IN MOST WESTERN POOL. (Approx. 8 fish)
- RIFFLE TRANSECTS WERE LOCATED IN SHALLOW (GRAVEL/SAND) proportions.
- POOL TRANSECT WERE LOCATED IN DEEPER PORTIONS OF STREAM
- GARLIC MUSTARD ON BOTH SIDES OF BANK.

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS

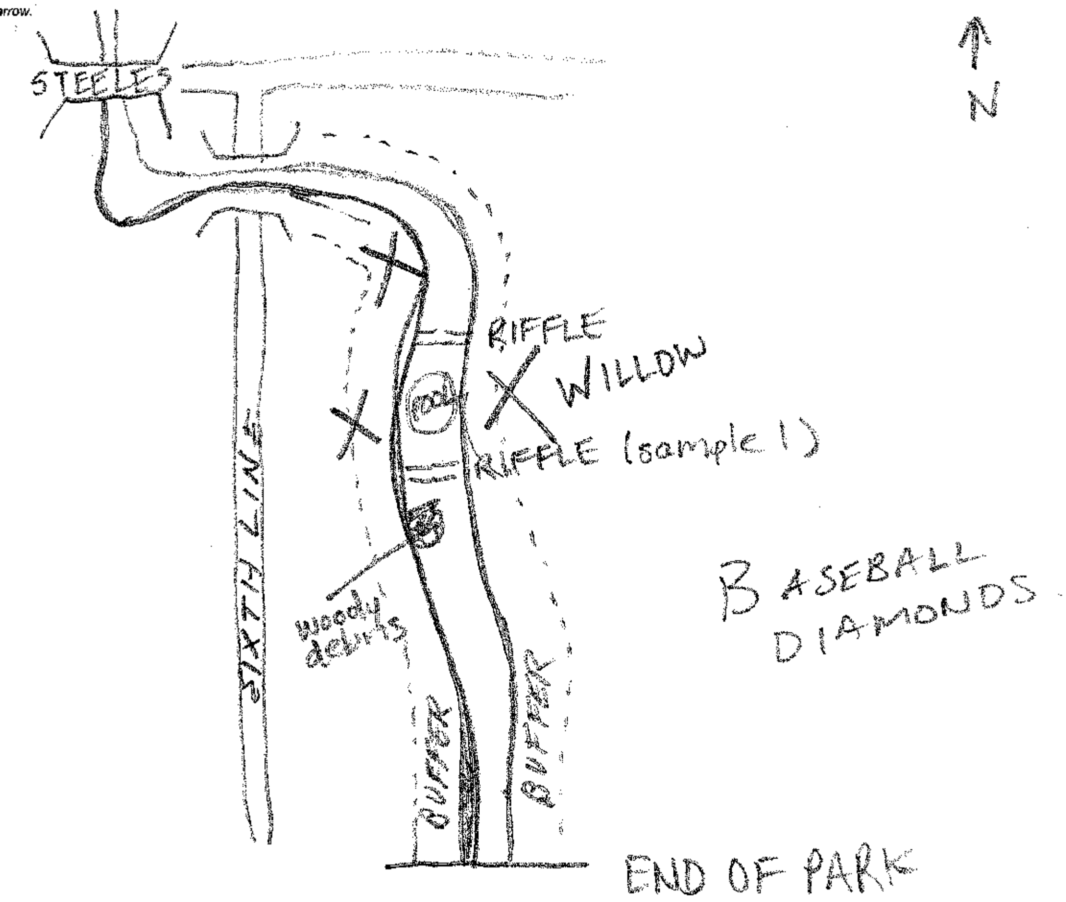
[redacted]

Date: MAY 28 2015	Stream name:
Time 1030	Site #: BTH 002
Agency: NRSI	Location: centroid of 3 replicates; Lat/Long or UTM SAM. 1 593343/4824156 SAM. 2 593340/4824161 SM 3 593338/4824185
Investigators: AMB / AMC	Elevation (m asl):
Water Quality	Datum/zone: NAD 1983
Water Temperature (°C): 18 °C	Conductivity (uS/cm): pH:
DO (mg/l): 92.6	Alkalinity (mg/l as $CaCO_3$):

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one): Traveling Kick & Sweep (circled) • Grab Sample • Other (specify):

Gear Type (circle one): • D-net (circled) • Ponar • Other (*specify*): • Ekman • Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)	10	3:00	0.02	2.7	20 mm	
Sample 2: Pool	10	3:00	0.04	3.5	0	
Sample 3: Riffle (cross-over)	10	3:00	0.02	2.7	20 mm	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	5	3	
2nd Dominant	2	5	

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes Siltation along banks

Organic Matter-Areal Coverage Use 1: Abundant, 2: Present, 3: Absent

	Sample 1	Sample 2	Sample 3
Woody Debris	1	3	3
Detritis	3	3	3

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	4	4
10-30 m	2	2
30-100 m	2	2

Road ~ 20m from right bank.

% Canopy Cover (circle one)

(0-24) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	3	3
Rooted Floating	3	3	3
Submergent	3	3	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	2	2	2
Attached Algae	2	2	2
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): 1m Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- Park is adjacent to creek - sportsfields

Candidate reference Site - Minimally Impacted? (circle one) Yes No

General Comments

- 2 major road crossings U/S - 6th line & Trafalger
- No fish observed, Crayfish

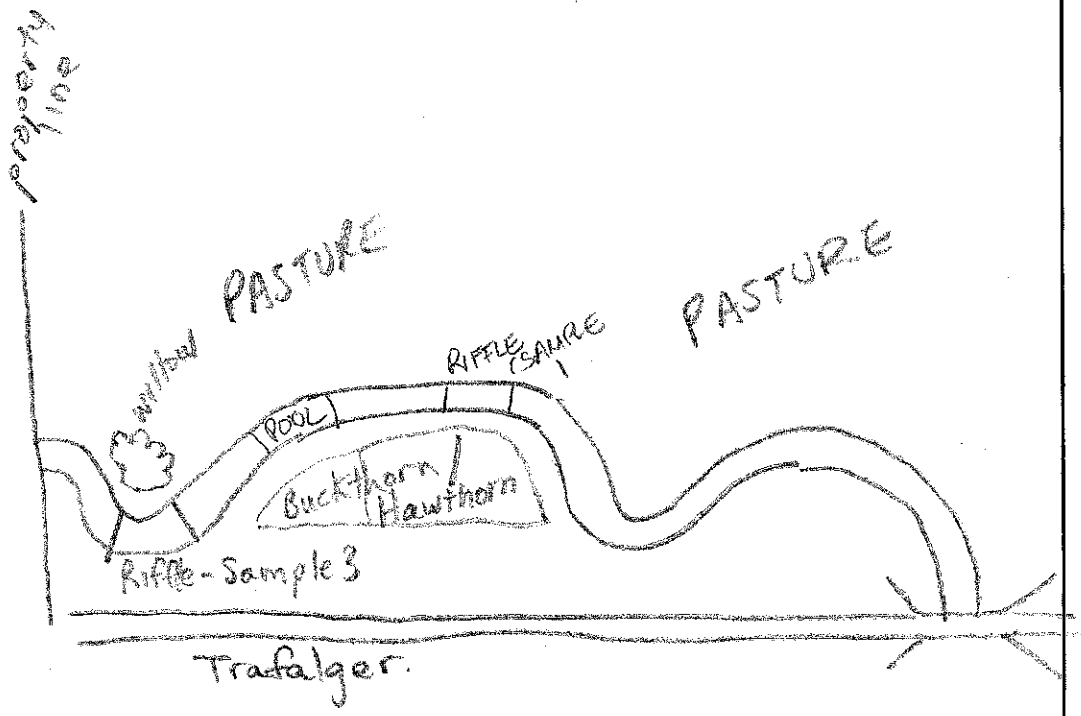
Ontario Benthos Biomonitoring Network Field Sheet: STREAMS

Date: MAY 28/15	Stream name:
Time 1120	Site #: ETH - 003
Agency: ARSI	Location: centroid of 3 replicates, Lat/Long or UTM
Investigators: AMC/AME	S1 593116 4824128 S2 593116 4824108 S3 593116 4824090 Elevation (m asl):
Water Quality	Datum/zone: NAD 83
Water Temperature (°C): 20.2	Conductivity (uS/cm): pH:
DO (mg/l): 7.86	Alkalinity (mg/l as $CaCO_3$):

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):

- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)

- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)	10	3	0.15	1.5	30	
Sample 2: Pool	10.5	3	0.50	2	5	
Sample 3: Riffle (cross-over)	10	3	0.10	1.5	35	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	4	2	4
2nd Dominant	2	4	2

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

MOSTLY SAND ON SITE WITH GRAVEL IN RIFFLES AND SILT ALONG BANKS.

Organic Matter-Areal Coverage

Use 1: Abundant, 2: Present, 3: Absent

	Sample 1	Sample 2	Sample 3
Woody Debris	3	3	2
Detritis	3	3	3

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	2	2
10-30 m	2	2
30-100 m	2	2

% Canopy Cover (circle one)

(0-24) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3 (ARROW HEAD)
Emergent	3	2	3
Rooted Floating	3	3	3
Submergent	2	3	2
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	1	2	3
Attached Algae	3	3	3
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): 5,5 Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- Surrounded by pasture — livestock accessible

Candidate reference Site - Minimally Impacted? (circle one) Yes No

General Comments

- high erosion @ stream banks
- fish observed
- ODONATES (ADULTS) PRESENT ON VEGETATION

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS

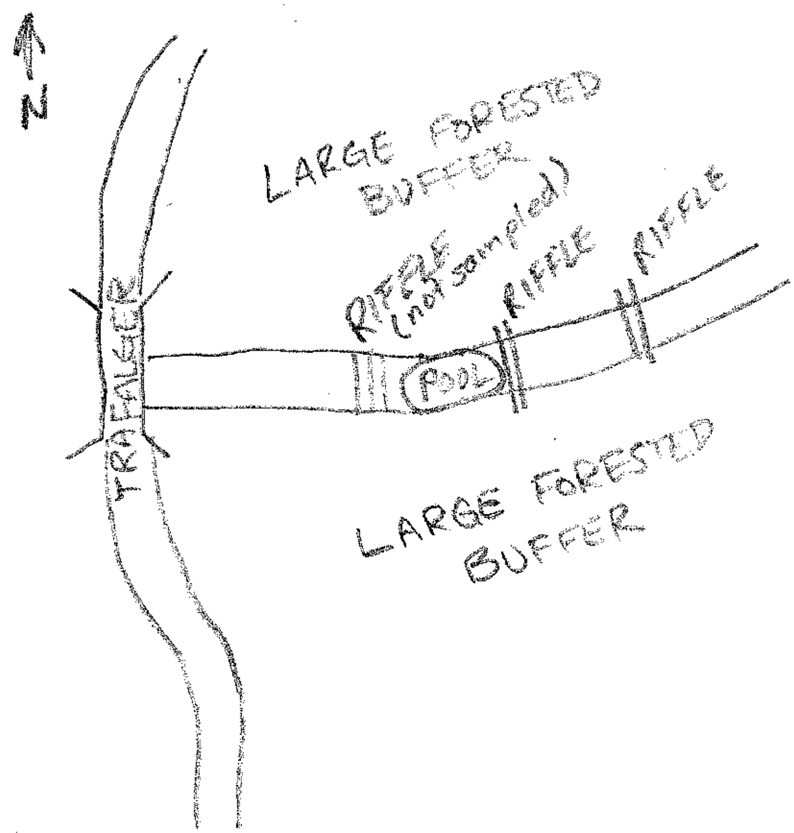
[redacted]

Date: MAY 28/15	Stream name:
Time: 1400	Site #: BTH-004 → 593038 / 4825550
Agency: NRSI	Location (centroid of 3 replicates; Lat/Long or UTM): 1: 593030 2: 593055 4825542 3: 593077 4825568
Investigators: AME/AMC	Elevation (m asl):
Water Quality	Datum/zone: NAD 1983
Water Temperature (°C): 22.2	Conductivity (uS/cm): pH:
DO (mg/l): 105%	Alkalinity (mg/l as $CaCO_3$):

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):	**Gear Type** (circle one)
• Traveling Kick & Sweep (circled) • Grab Sample	• D-net (circled) • Ponar • Other (*specify*):
• Other (specify):	• Ekman • Rock Baskets
	Mesh Size: 500 micron (or specify)

Sub-samples	**Sampling distance covered (m)**	**Time (min.)**	**Max. Depth (m)**	**Wetted Width (m)**	**Max. Hydraulic Head (mm)**	**# Grabs pooled per sample**
Sample 1: Riffle (cross-over)	11 ~~10~~	3:00	0.005	3.0	5 mm	
Sample 2: Pool	9.5 ~~10~~	3:00	0.50	3.8	~~0~~	
Sample 3: Riffle (cross-over)	10 ~~10~~	3:00	0.01	~~[illegible]~~ 5.5	5mm	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	4	2	5
2nd Dominant	5	5	4

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage

Use 1: Abundant, 2: Present, 3: Absent

	Sample 1	Sample 2	Sample 3
Woody Debris	3	3	
Detritis	2	1	

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	6	6
10-30 m	6	6
30-100 m	6	6

% Canopy Cover (circle one)

0-24 25-49 (50-74) 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	3	3
Rooted Floating	3	3	3
Submergent	3	3	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	2	2	2
Attached Algae	1	1	1
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): Discharge ~~(m³/s~~ optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- Coulson Forest Tract (Halton Regional Forest)
- Trafalger Rd transects

Candidate reference Site - Minimally Impacted? (circle one) Yes No

General Comments

- Rainbow darters captured & released
- Box culvert crossing below site
- Watercress @ top of site

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS

Date: MAY 06/15
Time: 1500
Agency: NRSI
Investigators: EMME / HMC

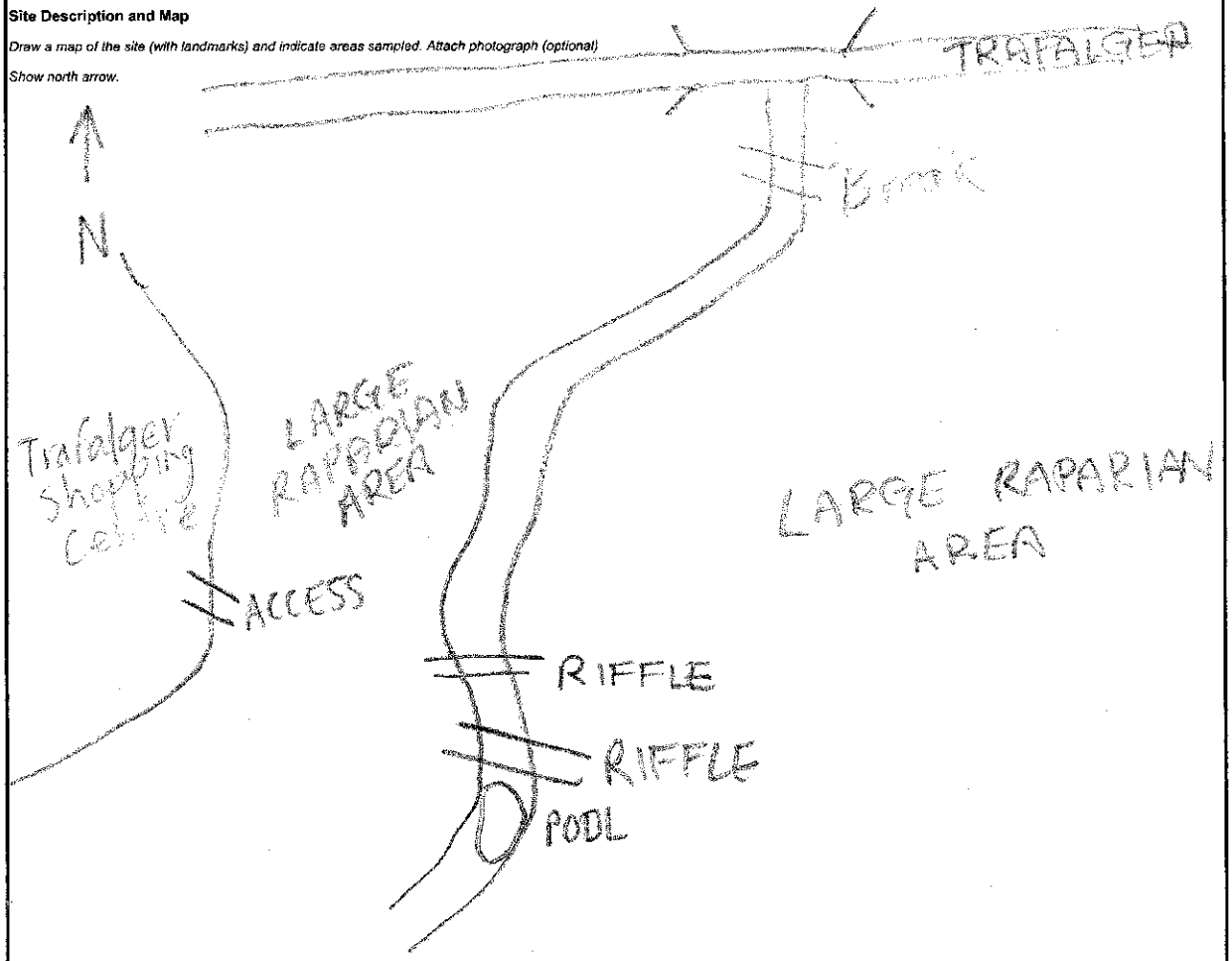
Stream name:
Site #: BTH-005
Location: centroid of 3 replicates; Lat/Long or UTM
S1: 594763 4825545
S2: 594775 4825529
S3: 594757 4825556
Elevation (m asl):
Datum/zone: NAD 1983

Water Quality
Water Temperature (°C): 26oc
DO (mg/l): 116.5%
Conductivity (uS/cm):
pH:
Alkalinity (mg/l as $CaCO_3$):

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):
- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)
- D-net
- Ponar
- Other (*specify*):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)	10	3:00	0.1	1.5	5	
Sample 2: Pool	10	3:00	0.4	2.5	5	
Sample 3: Riffle (cross-over)	10	3:00	0.1	1.5	5	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	2	2	2
2nd Dominant	5	3	5

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage

Use 1: Abundant, 2: Present, 3: Absent

	Sample 1	Sample 2	Sample 3
Woody Debris	2	3	3
Detritis	3	3	3

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	4	4
10-30 m	4	4
30-100 m	4	4

% Canopy Cover (circle one)

(0-24) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	3	3
Rooted Floating	3	3	3
Submergent	3	3	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	2	3	2
Attached Algae	2	3	2
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): 5.0 Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- Scrubland valley / meadow

Candidate reference Site - Minimally Impacted? (circle one) Yes No

General Comments

- Construction @ creek crossing on Trafalger
- Drainage area fairly large - likely collects large amounts of run off

Fish Sampling Survey

Field Data Forms

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FISH SAMPLING

PROJECT (Number & Name): 1624 Halton Hills Gateway
Field Staff: AMC AME
Station: EMS-001
Site Location:
Waterbody:
GPS Datum: NAD 83 Easting: 592630
Drainage System:
Zone: 17T Northing: 4825196
Location in System: Golf Course
Appr. Reach Length (m): 42.5 m. Sampling Area (m²): 759 Water Depth (m): 0.3 - 1.0
Survey Date: September 14, 2015 **Weather Conditions:**
Water Quality: Wind: LS Cloud Cover (%): Ø Precip: NONE
Time Measured: 08:55 pH: 7.57 Air Temp. (°C): 11°C Water Temp. (°C): 10.7°C
Conduct.(µs/cm): 663 ppm: 328.

SAMPLING METHOD

Sampling Protocol & Description:
Gear used: Electrofishing Boat Angling Seine Net Minnow Trap
(Electrofishing Backpack)
Pulsating Frequency (Hz): 70 Start Time: 915 End Time: 950 Total Set/Sampling Time: 35min
Voltage: 100 Amps: 3.5 Shocking Seconds: 689 Net Length: —
Power (Volts x Amps = Watts): Number of netters: 1 Net Size: —

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
SM BASS	57	55	2.1		1
AM. BR. LAMPREY	190		12.5	555 - 557	1
BROOK TROUT	176	174	55.3	558	1
B.N. DACE	48	77	95.7	Ensured I.D. using ROM fish ID. (Redside negative)	37

STATION CODES: Electrofishing EMS-000 Minnow Trap MNT-000 Seine Net SEN-000
Angling AGL-000

DNC- Did Not Collect
NA- Not Applicable

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length / Bulk Largest	Fork Length / Bulk Shortest	Weight / Bulk Weight	Tag # / Spawning Condition / Bulk Tally	Recap? / Final #

SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

WETTED WIDTHS
1.35, 1.4, 1.6, 1.95, 1.25, 2.24, 1.8, 1.47, 1.53, 1.3

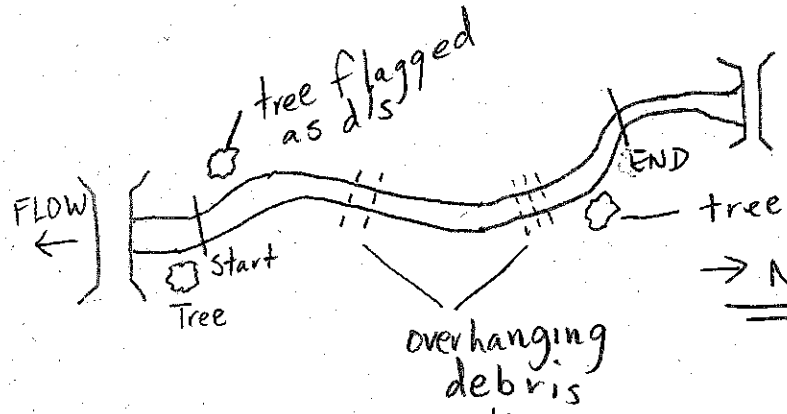
Mean W.W = 1.785
Lengt = 42.5
Area = 75.9 m²
Target = 5sec = 380 - 7sec = 531 seconds

• DS Marker is 3m US of DS START POINT

• US Marker is 7m DS of US END POINT

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



- watercress throughout

Pictures:
551 - D/s looking D/s
552 - D/s looking U/S
553 - U/S looking D/S
554 - U/S looking U/S

* Spring (natural) occurs just N of golf course

Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

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FISH SAMPLING

PROJECT (Number & Name): 1624 - H.H. Gateway
Field Staff: AME / AMC
Station: EMS-002
Site Location:
Waterbody:
GPS Datum: NAD 83. Easting: 593039
Drainage System:
Zone: 17T Northing: 4825553
Location in System: NE of Traf
Appr. Reach Length (m): 44.75m Sampling Area (m²): Water Depth (m):
Survey Date: Sept 14 2015 **Weather Conditions:**
Water Quality: Wind: 0 Cloud Cover (%): 0 Precip: No
Time Measured: 1050 pH: 7.34 Air Temp. (°C): 17 Water Temp. (°C): 13.4
Conduct.(µs/cm): 867 (433 ppm)

SAMPLING METHOD

Sampling Protocol & Description:
Gear used: Electrofishing Boat Angling Seine Net Minnow Trap
(Electrofishing Backpack)
Pulsating Frequency (Hz): 70 Start Time: 1215 End Time: 1245 Total Set/Sampling Time: 0.5HR
Voltage: 100 Amps: 3.5 Shocking Seconds: 1119 Net Length: —
Power (Volts x Amps = Watts): Number of netters: 1 Net Size: —

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
CR. CHUB	177	49	90.0+ 38.1 + 123.1 = 141.2	~~9 + 13 + 6~~ Total Bulk Wt = 141.2	28
BN DACE	86	36	80.1		34
C.W. SUCKER	147	~~43~~ 43	60.5		7
J. DARTER	54	26	28.8		~~33~~ 32
F.H. MINNOW	92	69	17.7		3
BROOK STICKLEBACK	38	37	0.5		1
FANTAIL DARTER	62	38	29.0		26
RAINBOW DARTER	57	20	34.5 + 5.7 = 40.2		27 + 5 = 32
IOWA DARTER	56	50	6.1		4

STATION CODES: Electrofishing EMS-000; Minnow Trap MNT-000; Seine Net SEN-000; Angling AGL-000

DNC- Did Not Collect
NA- Not Applicable

90.0
38.1
123.1
141.2

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length Bulk Largest	Fork Length Bulk Shortest	Weight Bulk Weight	Tag # / Spawning Condition Bulk Tally	Recap? Final #

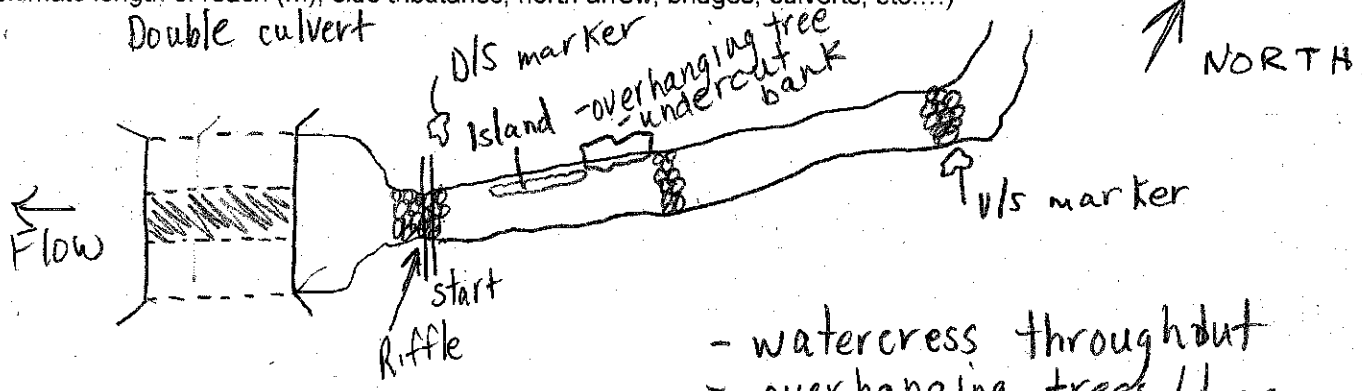
SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

PICTURE - D/S looking D/S 559
D/S " " U/S 560
U/S " " D/S 561
D/S " " U/S 562-

5.3, 4.7, 4.7, 4.9, 6.0, 4.4, 5.1, 4.5, 4.6, 2.8 = Wetted widths
4.7 m = mean wetted width
44.75m = site length
210 m^2 = Area
1050sec @ 5sec + 1470 sec @ 7sec.

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



- watercress throughout
- overhanging trees / logs throughout

Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

NATURAL RESOURCE SOLUTIONS INC.

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FISH SAMPLING

PROJECT (Number & Name): 1624 Halton Hills Gateway
Field Staff: AME AMC
Station: EMS-003 **Site Location:**
Waterbody: GPS Datum: NAD83 Easting: 593366
Drainage System: Zone: 17T Northing: 4824128
Location in System: Park S. of Steeles
Appr. Reach Length (m): 50.0 Sampling Area (m²): Water Depth (m):
Survey Date: September 14, 2015 **Weather Conditions:**
Water Quality: Wind: 2 W Cloud Cover (%): 0 Precip: NONE
Time Measured: 15:10 pH: 7.65 Air Temp. (°C): 22 Water Temp. (°C): 16.2
Conduct.(µs/cm): 685

SAMPLING METHOD

Sampling Protocol & Description: OSAP
Gear used: Electrofishing Boat Angling Seine Net Minnow Trap
Electrofishing Backpack
Pulsating Frequency (Hz): 70 Start Time: 1540 End Time: 1610 Total Set/Sampling Time: 0.5 HR
Voltage: 150 Amps: 5.0 Shocking Seconds: 1133 Net Length:
Power (Volts x Amps = Watts): Number of netters: 1 Net Size:

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
BN DACE	87	46	67.6 58.2	125.8 34	21 13
Y. BULLHEAD	102	100	8.9		1
F.H. MINNOW	79	72	8.9		2
J. DARTER	62	46	82.4		29
FANTAIL DARTER	64	63	2.3		1
SM BASS	57	55	2.9		1
S.T. SHINER	61	56	3.6+3.6		2 3
CR. CHUB	73	68	4.0		1
C.W. SUCKER	79	52	91.2		23
R. DARTER	67	33	61.1		33

STATION CODES: Electrofishing EMS-000 Minnow Trap MNT-000 Seine Net SEN-000
Angling AGL-000

DNC- Did Not Collect
NA- Not Applicable

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length Bulk Largest	Fork Length Bulk Shortest	Weight Bulk Weight	Tag # / Spawning Condition Bulk Tally	Recap? Final #

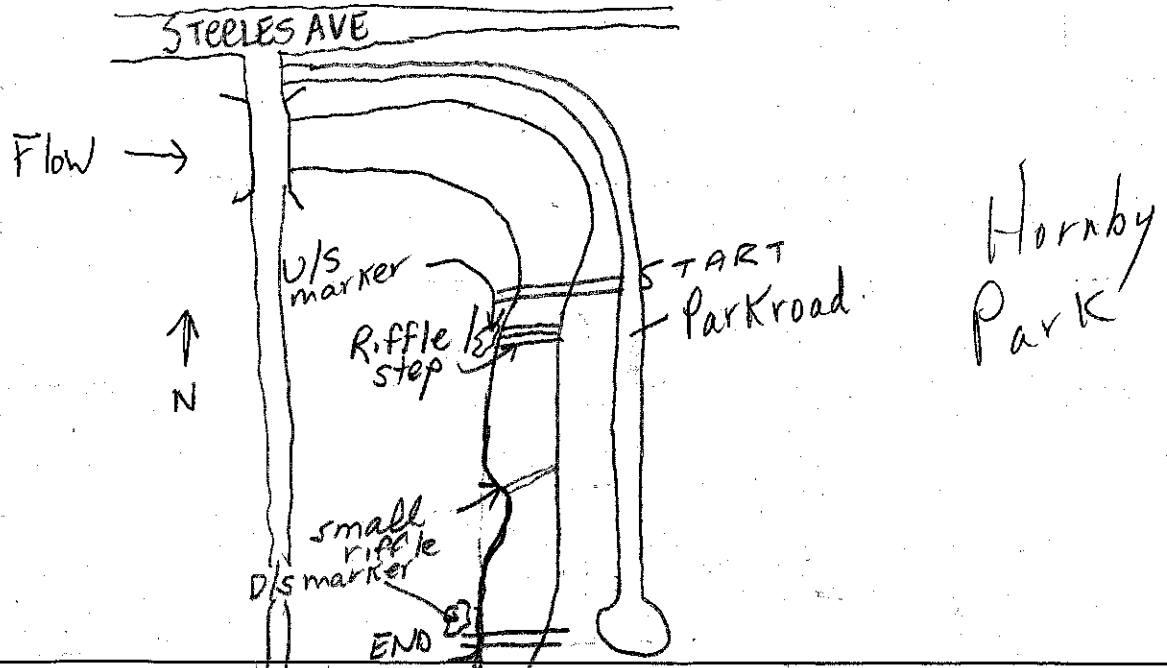
SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

563 - D/S looking D/S
564 - D/S looking U/S
565 - U/S looking D/S
566 - U/S looking U/S

4.0, 3.6, 3.9, 3.1, 3.2, 3.7, 3.9, 3.5, 3.8
3.4
3.61 m = mean wetted width
500 m = site length
180.5 m^2 = area
902 sec @ 5sec + 1263.5 @ 7sec

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

NATURAL RESOURCE SOLUTIONS INC.

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FISH SAMPLING

PROJECT (Number & Name): 1624 Halton Hills Gateway
Field Staff: AME / AMC
Station: EMS-004
Site Location:
Waterbody:
GPS Datum: NAD 83 Easting: 594752
Drainage System:
Zone: 17T Northing: 4825538
Location in System: Toronto Outlet Mall
Appr. Reach Length (m): 52.35 Sampling Area (m²): 144 Water Depth (m): 0.2 - 1.0
Survey Date: September 6, 2015 **Weather Conditions:**
Water Quality: Wind: 0 Cloud Cover (%): 0 Precip: NONE
Time Measured: 910 pH: 7.56 Air Temp. (°C): 16 Water Temp. (°C): 14.1
Conduct.(µs/cm): 711 (355 ppm)

SAMPLING METHOD

Sampling Protocol & Description:
Gear used: Electrofishing Boat Angling Seine Net Minnow Trap
Electrofishing Backpack
Pulsating Frequency (Hz): 60 Start Time: 9:00 End Time: 10:00 Total Set/Sampling Time:
Voltage: 150 Amps: 6.5 Shocking Seconds: 978 Net Length:
Power (Volts x Amps = Watts): Number of netters: 1 Net Size:

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
CREEK CHUB	108	26	96+175+1.1 = 268.6	⊠⊠⊠⊠⊠	56
ADD CREEK CHUB			88		17
NORTHERN REDBELLY DACE	58	39	29.8	⊠⊠	21
BLACKNOSE DACE	69	28	66.4	⊠⊠⊠⊠	43
BROOK STICKLEBACK	33	32	26.5	⊠	5
SPOTTAIL SHINER	59	31	22.6	⊠	13
JOHNNY DARTER	55	32	48.6	⊠⊠⊠□	48
WHITE SUCKER	113	46	106.4	⊠⊠⊠	30

STATION CODES: Electrofishing EMS-000 Minnow Trap MNT-000 Seine Net SEN-000
Angling AGL-000

DNC- Did Not Collect
NA- Not Applicable

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length / Bulk Largest	Fork Length / Bulk Shortest	Weight / Bulk Weight	Tag # / Spawning Condition / Bulk Tally	Recap? / Final #

SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

1.7, 2.2, 2.6, 3.0, 3.9, 2.2, 3.2, 2.9, 2.2, 3.6 = 27.5/10 = 2.75m mean W.W.

18.25 + 13.75 + 11.35 + 9.0 = 52.35m - reach length

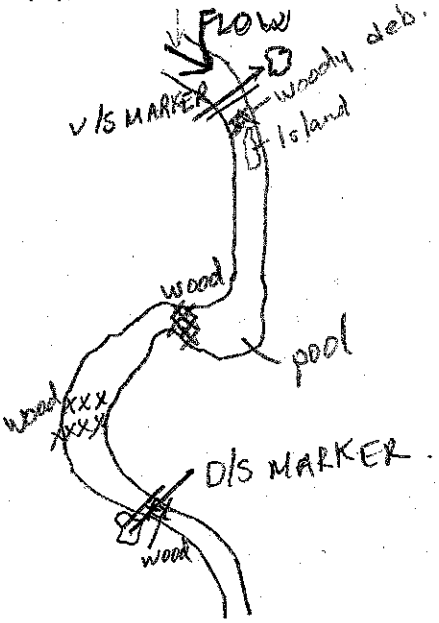
Area = 2.25 x 52.35 = 149.0 m^2

5 sec/m^2 = 720sec TO 7sec/m^2 = 1008sec

U/S looking D/S = 567
U/S looking D/S = 568
D/S looking U/S = 569
D/S looking = 570

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



N

- surrounded by meadow/decid. forest
- fairly high silt/clay mixture (turbid)

Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

NATURAL RESOURCE SOLUTIONS INC.

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FISH SAMPLING

PROJECT (Number & Name): 1624 Halton Hill Gateway
Field Staff: AME/ AMC
Station: EMS-005
Site Location:
Waterbody:
GPS Datum: NAD 83 Easting: 593109
Drainage System:
Zone: 17T Northing: 4824096
Location in System: N. of ~~Trafalo~~ Steeles @ Hornby Park
Appr. Reach Length (m): 44.8 Sampling Area (m²): 112.5 Water Depth (m): 0.2 - 1.0
Survey Date: September 15, 2015 **Weather Conditions:**
Water Quality: Wind: 0 Cloud Cover (%): 0 Precip: N0
Time Measured: 1250 pH: 7.61 Air Temp. (°C): 21 Water Temp. (°C): 15.1
Conduct.(µs/cm): 623 (311 ppm)

SAMPLING METHOD

Sampling Protocol & Description:
Gear used: Electrofishing Boat Angling Seine Net Minnow Trap
(Electrofishing Backpack)
Pulsating Frequency (Hz): 70 Start Time: 1330 End Time: 1400 Total Set/Sampling Time: 0.5
Voltage: 150 Amps: 5.2 Shocking Seconds: 732 Net Length:
Power (Volts x Amps = Watts): Number of netters: 1 Net Size:

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
BLACKNOSE DACE	86	47	82.7+3.6 = 86.3	☒☒	28
WHITE SUCKER	192	57	69.8+193.6 = (265.4)	☒☒ :	~~23~~ 24
JOHNNY DARTER	61	42	32.4	☒☒ :	23
RAINBOW DARTER	54	39	13.3	☒	10
CREEK CHUB	149	55	46.7+70.3 = (117.0)	☒	10
FANTAIL DARTER	69	68	2.8		1
SMALL MOUTH BASS	64	57	7.0	:	3
BLUNTNOSE MINNOW	67	51	17	~~-~~ ☑	9
COMMON SHINER	105	53	23.2	:	5

STATION CODES: Electrofishing EMS-000 Minnow Trap MNT-000 Seine Net SEN-000
Angling AGL-000

DNC- Did Not Collect
NA- Not Applicable

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length Bulk Largest	Fork Length Bulk Shortest	Weight Bulk Weight	Tag # / Spawning Condition Bulk Tally	Recap? Final #

SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

PICTURES

U/S looking U/S 571
U/S looking D/S 572
D/S looking U/S 573
D/S looking D/S 574

11.1 + 9.2 + 15.9 + 5.7 + 2.9 = 44.8m (site length)

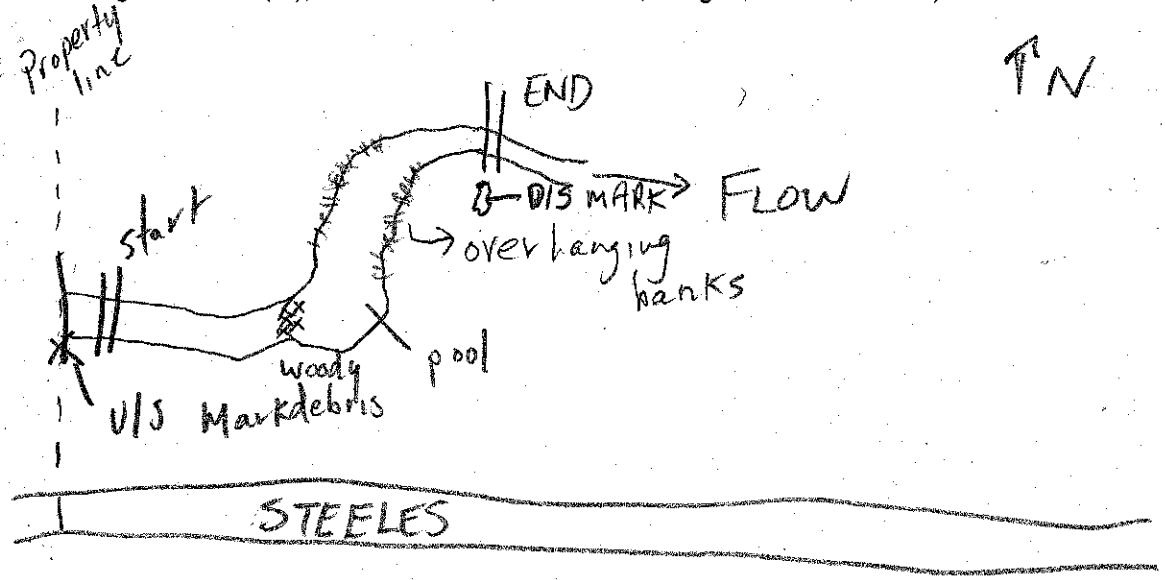
1.9 + 2.7 + 2.1 + 1.8 + 3.2 + 2.9 + 1.7 + 2.0 + 2.7 + 4.1
= 25.1m (2.5 1m average width)

= 112.5m² (area)

5sec/m² = 562e-secs 7sec/m² = 787e-secs

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

NATURAL RESOURCE SOLUTIONS INC.

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FISH SAMPLING

Page __ of __

PROJECT (Number & Name): 1624 Halton Hills Gateway
Field Staff: AME/AMC
Station: EMS-006
Site Location:
Waterbody:
GPS Datum: NAD83 Easting: 593689
Drainage System:
Zone: 17T Northing: 4824675
Location in System: South of Steeles, East of Hornby
Appr. Reach Length (m): 42.3m Sampling Area (m^2): 132.4 m^2 Water Depth (m): 0.2 - 1.2
Survey Date: 4 Sept 15/2015 **Weather Conditions:**
Water Quality: Wind: 0 Cloud Cover (%): 0 Precip: NO
Time Measured: 1445 pH: 7.62 Air Temp. (°C): 26 Water Temp. (°C): 17.5
Conduct.(µs/cm): 879 (445 ppm)

SAMPLING METHOD

Sampling Protocol & Description:
Gear used: Electrofishing Boat (Electrofishing Backpack) Angling Seine Net Minnow Trap
Pulsating Frequency (Hz): 70 Start Time: ~~1440~~ 1500 End Time: 1530 Total Set/Sampling Time: 0.5 HR
Voltage: 150 Amps: ~4.8 Shocking Seconds: 1169 Net Length: —
Power (Volts x Amps = Watts): Number of netters: 1 Net Size: —

COLLECTION

Common Name or Scientific Name	Total Length mm / Bulk Largest mm	Fork Length mm / Bulk Shortest mm	Weight g / Bulk Weight g	Comment / Bulk Tally	Final #
C. CHUB	209	101	183+142+137	467	15
C.W. SUCKER	170	47	142+80+122.5+1.6=346.1	☒☐☒☒	~~38~~ 39
BR. STICKLEBACK	47	33	9.7		12
B.N. DACE	90	35	38.0+66.7+13.7+6.9+5.3=130.6	☒☒☒☐	18
B.N. MINNOW	87	26	32.3 29.1 61.4	☒☒	22
Y BULLHEAD	187	186	68.8		1
RAIN BOW DARTER	61	47	9.5		9
JON. DARTER	62	30	42.2		38
C. SHINER	146	105.	84.4		4

STATION CODES: Electrofishing EMS-000; Angling AGL-000; Minnow Trap MNT-000; Seine Net SEN-000

DNC- Did Not Collect
NA- Not Applicable

COLLECTION (continued) Page __ of __

Common Name or Scientific Name	Total Length Bulk Largest	Fork Length Bulk Shortest	Weight Bulk Weight	Tag # / Spawning Condition Bulk Tally	Recap? Final #

SITE-SPECIFIC HABITAT NOTES, and GENERAL COMMENTS - Depths, flow, veg, wood, substrates

10.8 + 15.5 + 10.2 + 5.8 = 42.3m length

2.4 + 3.1 + 3.4 + 3.5 + 3.3 + 3.0 + 3.7 + 3.4 + 3.5 + 2.0
= 31.3 / 10 = 3.13m (avg. wetted width)

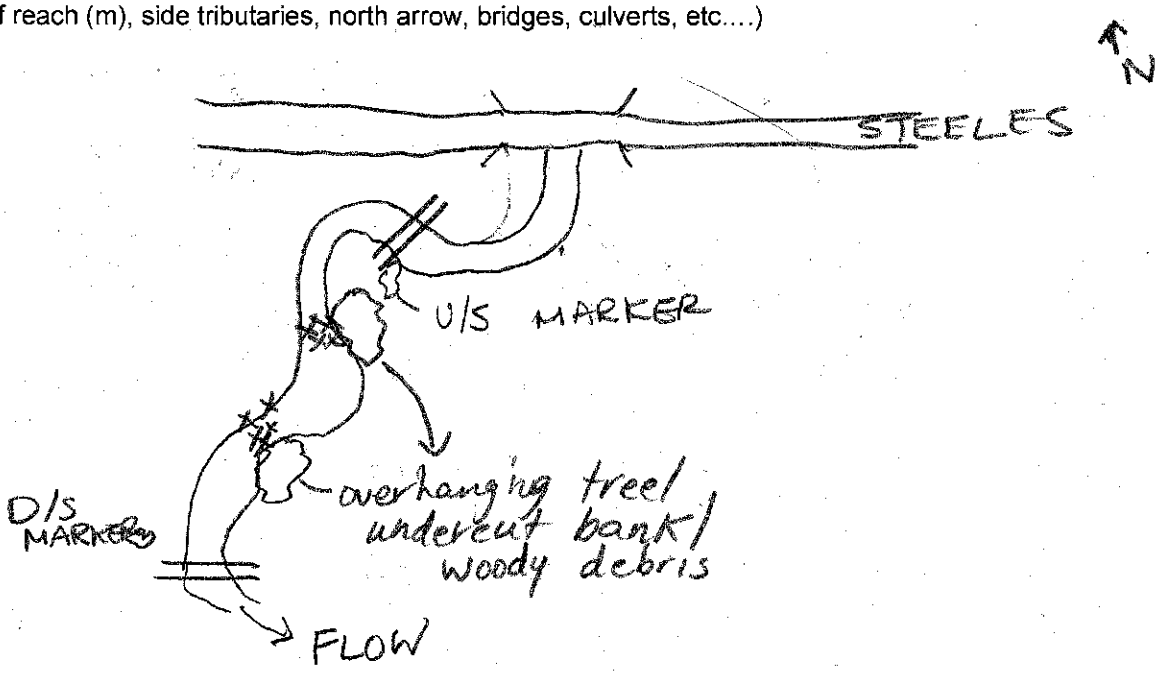
= 132.4 m^2 (site area)

@5sec/m^2 = 662 sec @ 7sec/m^2 = 926.8 sec

D/S looking D/S 575
D/S " U/S 576
U/S looking D/S 577
U/S looking U/S 578

GENERAL SITE DRAWING

(Include: watercourse and name, flow direction, adjacent landuse, riffle/pool/run habitat, roads and locality of station, approximate length of reach (m), side tributaries, north arrow, bridges, culverts, etc....)



Possible Species	#	Positive Identification	Determining Characteristics	#	Initials

Brook Trout Spawning Survey

Field Data Forms

1624 - Halton Hills Gateway — Nov. 18/15

Photo Log — SGB, AME

- Hwy 401 at bridge. 593708 mE 4823906m N
  Aquatic Habitat Characterization

PB180077	Bridge	- facing E (upstream)	
78	Bridge entrance	- facing SE (downstream)	
79	"	"	
80	"	"	
81	"	"	
82	"	"	
83	Channel upstream from bridge		
84	"	"	facing N
85	"	"	" NW
86	Backwater area u/s from log jam		" SW
87	Confluence of two channels		" NW
88	View d/s from E channel		" E
89	View u/s from W (main) channel		" W
90	View d/s	"	" E
91	Backwater area		" E
92	Backwater with watercress		
93	Log jam		" NE
94	Pool w/ tires at bridge entrance		" NE
95	View under bridge facing d/s		SE
96	"	"	"

1624

Nov. 18/15

Photo Log Cont'd

97 - View u/s under bridge facing NW
98 - " d/s from d/s extent of bridge " SE
99-100 - Swallow nests
101-102 - Animal tracks under bridge (deer, raccoon)
103-105 - Aquatic vegetation at d/s end of ~~extent~~ bridge
106 - " " " u/s " " "

Forget-me-not (Myosotis scorpioides)
Canada Waterweed (Elodea canadensis)

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AQUATIC HABITAT CHARACTERIZATION

PROJECT:	**Halton Premier Gateway 1B Study (Project 1624)**				
Field Staff:	SGB, AME				
Station ID:	HWY 401 - above crossing and below crossing				
GPS Datum:	593708 mE	4823906 mN			
Appr. Reach Length (m):	75m				
Survey Date:	NOV 18/2015	**Weather Conditions:**			
Time:	1030	Wind:	1	Cloud Cover (%):	100
		Precipitation:	0	Air Temperature:	8°C

ADJACENT LANDS

Riparian Zone	Vegetation Type:	- Meadow (grasses, small schrubs) - near 401 - Scrubland (schrubs, small trees, low density) approx. 25m adjacent to 401	
	Vegetation Density (HML):	Medium	
Canopy	Type: Deciduous	Quality and % shade:	Low quality + 5% shade ↳ maybe 15% in summer

CHANNEL MORPHOLOGY

Bankfull Width Range (m): 5.0 - 7.5	Wetted Width Range (m): 2.0 - 3.3m	Gradient (H/M/L):	L / M
Bank Height (range (m)): up to ~2.0m		Meander/Straight:	Straight / Meander or confluen
Bank Slope (degrees from surface of water): 90°/40°		Bank Stability:	Good / Good

CHANNEL SUBSTRATE % * # in front of "/" is d/s of 401, # behind "/" is u/s 401

Clay:	10	Gravel:	~~40~~ 30	Boulder:	0	Muck:	0
Silt:	10	Pebble:	0	Bedrock:	0	Detritus:	10
Sand:	25	Cobble:	15	Marl:	0	Other:	0

INSTREAM HABITAT AND COVER (Y/N)

Pools:	Y	Undercut Banks:	Y	Boulder/Rock:	N
Riffles:	Y	Woody Debris:	Y	Cobble:	Y
Backwater:	Y	Vegetation:	Y	Other:	N

INSTREAM VEGETATION

Type (submerg./emerg./floating)	Family/Genus/species	Description/Abundance
Watercress	⇔ emergent	Low / sparse
Water milfoil	⇔ emergent	Low / sparse
Algae	⇔ submergent	Low / sparse

GROUNDWATER

Evidence of Groundwater: Watercress (fairly minimal)
(e.g. watercress, rust staining, discharge):

WATER FLOW & QUALITY

Water Temp. (°C):	6.5°C	D.O. (ppm):	DNC	pH: DNC	Visible Characteristics/Other Parameters:
Time Taken:	1100	D.O. (%):	DNC	TDS (ppm): DNC	NA
Water Depth (m)	0.1 - 0.6	Conductivity (µs/cm):	DNC		
Flow:	DNC				

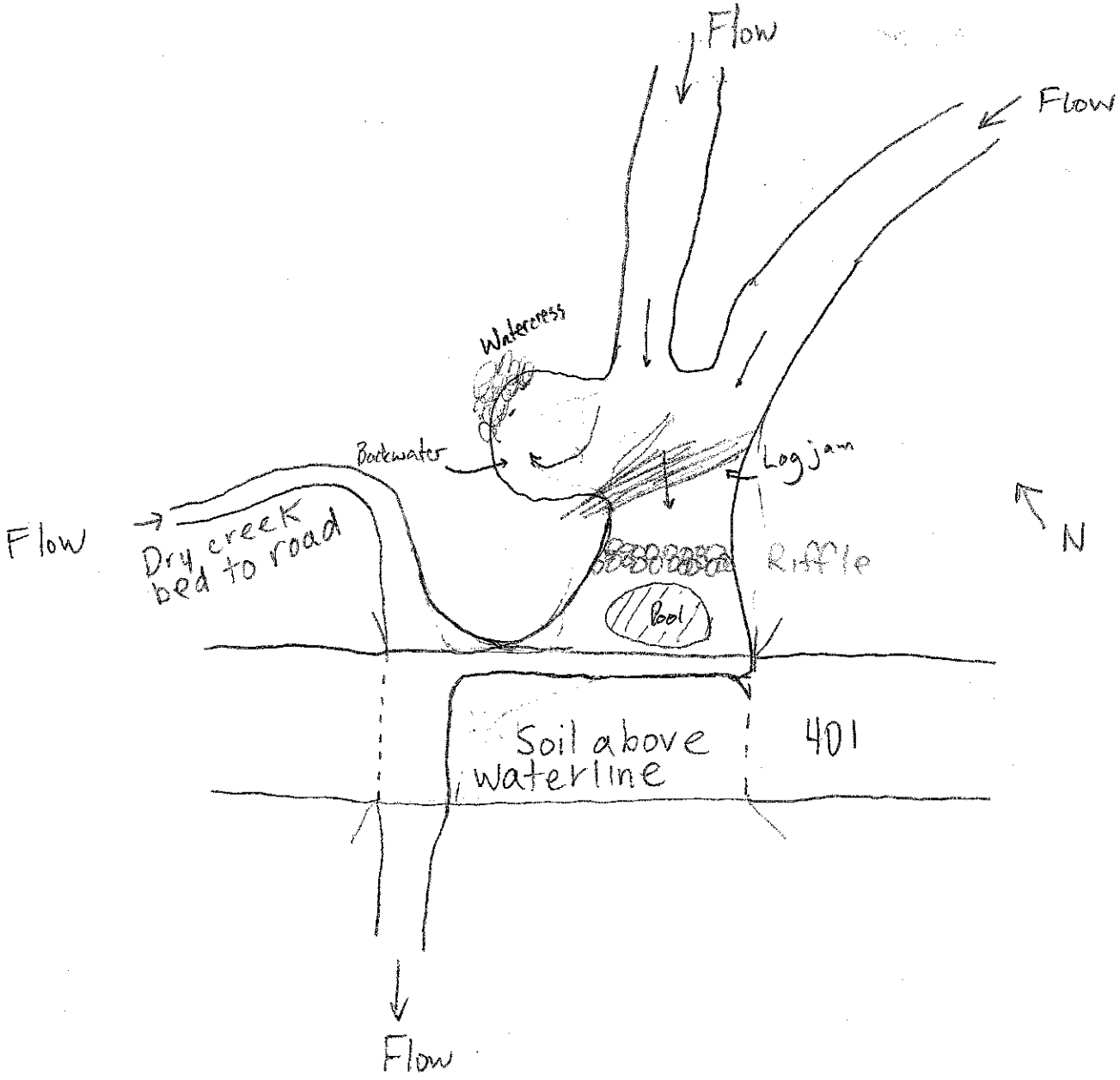
PHOTOS TAKEN

Photo #	Description	Photo #	Description
	To be completed		
	Refer to photo log.		

GENERAL COMMENTS

Fish observed, unusual conditions, differences from previous site visit, landowner comments, topography, general land use and vegetation, etc.:
- See sketch on back
- Bridge @ 401 w creek underneath
- 5 or so tires in creek
- swallow nests on bridge
- wildlife tracks under bridge
- crayfish observed + few fish
- heavy erosion observed and sedimentation (aggradation) under bridge.

DNC- Did Not Collect
NA- Not Applicable


Flow
Flow
Watercress
Backwater
Logjam
Flow
Dry creek bed to road
Riffle
N
Pool
Soil above waterline
401
Flow

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

SPAWNING VISUAL SURVEY

PROJECT: 1624 Halton Hills — SURVEY DATE: November 18, 2015

CREW MEMBERS: Steve B, Andrew E.

WATERBODY: Hornby Glen Creek. — GPS DATUM: — EASTING:

STATION ID: VSS- 001 — NORTHING:

WATER TEMP. (°C): 7°C — AIR TEMP. (°C): 8°C — TIME TAKEN: 10:00

WEATHER CONDITIONS: % Cloud 100 — Wind (direction and speed) 3-4

Precip. 0 — Other info

GENERAL WATER LEVELS, FLOW & CONDITIONS:

Depth Range (m): 0.05 - — Backwater:

Estimated Velocity (m/s): 0 - 0.5 — Shoal: N/A

Turbidity & Visibility: Visibility High — Riffle: Yes 40%

Rapids: N/A

SUBSTRATE MATERIAL:

Angular vs. Round Cobble: Mostly Round

Size of Cobble (percentage) 0-5cm: 90% — 5-20 cm: 10% — 20-30 cm: - — >30 cm: -

Other substrate notes: Sand and silt dominating, covering gravel in many areas.

CONFIRMED SPAWNING ACTIVITY: Tally of Fish Observed:	Behaviour (swimming/ courting/formation):	Location:
None	None	N/A

Behaviour Summary:	Swimming	Courting	In Formation	Other Notes:
Percentage:	Ø	Ø	Ø	No spawning observed.

App. Size Range of Fish (male & female, cm): N/A

Eggs or young Visible?: N/A

SITE DRAWING & DESCRIPTION OF AREA EXAMINED (use reverse side for larger site drawing; include specific location, access, distances, reference points, locations where fish were observed, etc.):

- Heavy filamentous algae in creek through most of the golf course.
- Watercress present throughout channel
- Overhanging grass thick in some areas, slowing flow.

Start: 9:00 End 10:00

PHOTOS/COMMENTS:

1624 - Hatton Hills Gateway — Nov. 18/15

- Western tributary assessment — Steve & Andrew E

NRSI on site at 10:00 and met landowner.
↳ Walked property where line shows on map, including property to south

- Observed narrow and shallow (~30cm x ~10cm) swale that had been dug by landowner to facilitate drainage from cultivated field.
- Swale does not appear to be a waterbody as it extends to southern extent of the property and then follows another ditch that extends west to the road.
- Other small swales are also dug across the field in a similar way to facilitate drainage.
- Characteristics:
  - no defined channel from flow, only defined due to being dug out.
  - some standing water in areas of the field ↳ dry near the southern extent of the field.

1624 Nov. 18/15

- Ditch doesn't follow line as indicated on the map.
  - ↳ it cuts ~~to~~ the southeast half way through the field
- No channel observed ~~to~~ extending onto the southeast property as ~~indicated~~ is shown on the map
- * Area of groundwater observed at the southern extent of the property line
  0592305 mE 4824157 mN
  Photos PB180122 - PB180124
  - ↳ watercress and some iron staining
  - ↳ appears to 'flow' SW/W onto adjacent property but no channel observed

Photos

PB180107	- Dry culvert N of driveway	
108	- "	
109	- Dry channel S of driveway (dug)	
110	- " " N " " ("waterbody" in question)	
111	- " S "	
112	- Dry culvert outlet	
113	- Dugout drainage channel	- facing S
114	- " " "	- " N
115	- " " "	- facing S

1624

Nov 18/15

Photos Cont'd

116 - Dugout drainage channel - facing N

117 - " " " - " S

118 - Southern extent of property line (NE)

119 - " " " (SW) showing drainage ditch to road (6th Line)

120 - Property to south showing no channel → facing NW

121 - → facing SE

125 - Property to the southeast showing no channel - facing SE

126 - View along property boundary - facing SW

* → groundwater / watercress at bottom of photo

127 - Property showing no channel - facing NW → well is visible in upper left.

128 - Property to south showing no channel (SE)

129 - View along southern edge of Erics property - facing E

130 - Watercourse with buffer - facing NW (upstream) 592475 mE 4823961 mN

131 - Watercourse with buffer - facing SE (downstream)

132 - Upstream view (NW)

1624 Nov 18/15

Photos Contd

133- Flow into culvert

134- " through channel

135- " " " -facing d/s (SE)

136- Watercress upstream from crossing

137- " " " "

Vascular Plant Species Reported From the Study Area

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region[5]	NHIC[6]	Halton Region Species at Risk (OMNRF)[7]	NRSI Observed							
												MEMM4	TAGM1	FODM7-3	SWMM1-1	FODM5-8	TAGM3	FODM7	TAGM2
												CUM1	CUP3	FOD7-3	SWM1-1	FOD5-8	CUP1-3	FOD7	CUP2
Pteridophytes	**Ferns & Allies**																		
Thelypteridaceae	**Beech Fern Family**																		
Phegopteris hexagonoptera	Broadbeech Fern	9	1		S3	SC	SC	Schedule 3	R2		X								
Gymnosperms	**Conifers**																		
Cupressaceae	**Cypress Family**																		
Thuja occidentalis	White Cedar	4	-3		S5				X						X				
Pinaceae	**Pine Family**																		
Picea abies	Norway Spruce		5	-1	SE3				XSR				X			X			
Picea glauca	White Spruce	6	3		S5				U				X				X		X
Pinus strobus	Eastern White Pine	4	3		S5				X								X		X
Pinus sylvestris	Scot's Pine		5	-3	SE5				X							X	X		X
Dicotyledons	**Dicots**																		
Aceraceae	**Maple Family**																		
Acer negundo	Manitoba Maple	0	-2		S5				X			X			X	X		X	
Acer rubrum	Red Maple	4	0		S5				X										X
Acer saccharinum	Silver Maple	5	-3		S5				X								X		
Acer saccharum ssp. saccharum	Sugar Maple	4	3		S5				X							X			
Acer X freemanii	Freeman's Maple								X					X					
Anacardiaceae	**Sumac or Cashew Family**																		
Toxicodendron rydbergii	Poison-ivy	0	0		S5				X				X			X	X	X	X
Apiaceae	**Carrot or Parsley Family**																		
Daucus carota	Wild Carrot		5	-2	SE5				X			X				X	X		
Apocynaceae	**Dogbane Family**																		
Apocynum androsaemifolium ssp. androsaemifolium	Spreading Dogbane	3	5		S5				X							X			
Asclepiadaceae	**Milkweed Family**																		
Asclepias syriaca	Common Milkweed	0	5		S5				X							X			
Asteraceae	**Composite or Aster Family**																		
Arctium minus ssp. minus	Common Burdock		5	-2	SE5				X							X			X
Bidens cernua	Stick-tight	2	-5		S5				X								X		
Centaurea maculosa	Spotted Knapweed		5	-3	SE5				X										X
Cichorium intybus	Chicory		5	-1	SE5				X										X
Erigeron annuus	Daisy Fleabane	0	1		S5				X								X		
Eupatorium perfoliatum	Perfoliate Thoroughwort	2	-4		S5				X				X						
Inula helenium	Elecampane		5	-2	SE5				X			X					X		X
Liatris spicata	Spiked Blazing Star	9	0		S3	THR	T	Schedule 1	R1		X								
Solidago altissima var. altissima	Tall Goldenrod	1	3		S5				X			X	X		X	X	X	X	
Solidago canadensis	Canada Goldenrod	1	3		S5				X			X	X			X	X		X
Sonchus arvensis ssp. arvensis	Field Sow-thistle				SE5				X							X	X		X
Symphyotrichum lanceolatum var. lanceolatum	Tall White Aster	3	-3		S5				X			X		X	X		X		
Symphyotrichum lateriflorum var. lateriflorum	Calico Aster	3	-2		S5				X				X			X	X		X
Symphyotrichum novae-angliae	New England Aster	2	-3		S5				X										X
Taraxacum officinale	Common Dandelion		3	-2	SE5				X				X			X	X		X
Tragopogon pratensis ssp. pratensis	Meadow Goat's-beard		5	-1	SE5				X										X
Balsaminaceae	**Touch-me-not Family**																		
Impatiens capensis	Spotted Touch-me-not	4	-3		S5				X						X				X
Berberidaceae	**Barberry Family**																		
Podophyllum peltatum	May-apple	5	3		S5				X							X			
Betulaceae	**Birch Family**																		
Betula alleghaniensis	Yellow Birch	6	0		S5				X						X				
Boraginaceae	**Borage Family**																		
Hackelia virginiana	Virginia Stickseed	5	1		S5				U									X	

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region[5]	NHIC[6]	Halton Region Species at Risk (OMNRF)[7]	NRSI Observed							
Brassicaceae	**Mustard Family**																		
Alliaria petiolata	Garlic Mustard		0	-3	SE5				X				X		X	X	X	X	
Hesperis matronalis	Dame's Rocket		5	-3	SE5				X								X	X	X
Campanulaceae	**Bellflower Family**																		
Lobelia inflata	Indian Tobacco	3	4		S5				X							X			
Caprifoliaceae	**Honeysuckle Family**																		
Lonicera tatarica	Tartarian Honeysuckle		3	-3	SE5				X				X				X	X	X
Viburnum opulus	Guelder Rose		0	-1	SE4				X					X			X	X	
Celastraceae	**Staff-tree Family**																		
Euonymus obovata	Running Strawberry-bush	6	5		S5				X							X			
Cornaceae	**Dogwood Family**																		
Cornus alternifolia	Alternate-leaved Dogwood	6	5		S5				X										X
Cornus florida	Eastern Flowering Dogwood	7	4		S2?	END	E	Schedule 1	U		X								
Cornus foemina ssp. racemosa	Red Panicled Dogwood	2	-2		S5				X				X				X		
Cornus stolonifera	Red-osier Dogwood	2	-3		S5				X			X			X		X	X	X
Cucurbitaceae	**Gourd Family**																		
Echinocystis lobata	Prickly Cucumber	3	-2		S5				X						X	X	X		
Dipsacaceae	**Teasel Family**																		
Dipsacus fullonum ssp. sylvestris	Wild Teasel		5	-1	SE5				X			X				X	X		
Fabaceae	**Pea Family**																		
Gleditsia triacanthos	Honey Locust	3	0		S2				X					X					
Lotus corniculatus	Bird's-foot Trefoil		1	-2	SE5				X										X
Vicia cracca	Tufted Vetch		5	-1	SE5				X							X			
Fagaceae	**Beech Family**																		
Castanea dentata	American Chestnut	8	5		S2	END	E	Schedule 1	R3		X								
Fagus grandifolia	American Beech	6	3		S5				X							X			
Quercus macrocarpa	Bur Oak	5	1		S5				X				X	X	X		X	X	X
Quercus rubra	Red Oak	6	3		S5				X							X			
Gentianaceae	**Gentian Family**																		
Frasera caroliniensis	American Columbo	10	5		S2	END	E	Schedule 1	R3		X								
Guttiferae	**St. John's-wort Family**																		
Hypericum perforatum	Common St. John's-wort		5	-3	SE5				X			X	X						
Hydrophyllaceae	**Water-leaf Family**																		
Hydrophyllum virginianum	Virginia Water-leaf	6	-2		S5				X							X			
Juglandaceae	**Walnut Family**																		
Juglans cinerea	Butternut	6	2		S3?	END	E	Schedule 1	X								X (DEAD)		
Juglans nigra	Black Walnut	5	3		S4				X					X			X	X	
Lamiaceae	**Mint Family**																		
Leonurus cardiaca ssp. cardiaca	Common Motherwort		5	-2	SE5				X							X			
Prunella vulgaris ssp. lanceolata	Heal-all	5	5		S5				X										
Pycnanthemum incanum var. incanum	Hoary Mountain-mint	10	5		S1	END	E	Schedule 1	R2		X								
Lythraceae	**Loosestrife Family**																		
Lythrum salicaria	Purple Loosestrife		-5	-3	SE5				X			X							
Moraceae	**Mulberry Family**																		
Morus rubra	Red Mulberry	10	1		S2	END	E	Schedule 1	R1		X								
Oleaceae	**Olive Family**																		
Fraxinus americana	White Ash	4	3		S5				X				X			X	X		X
Fraxinus pennsylvanica	Green Ash	3	-3		S5				X						X			X	
Onagraceae	**Evening-primrose Family**																		
Oenothera biennis	Common Evening-primrose	0	3		S5				R1										X

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region[5]	NHIC[6]	Halton Region Species at Risk (OMNRF)[7]	NRSI Observed							
Plantaginaceae	**Plantain Family**																		
Plantago major	Common Plantain		-1	-1	SE5				X							X			
Polygonaceae	**Smartweed Family**																		
Rumex crispus	Curly-leaf Dock		-1	-2	SE5				X			X							
Ranunculaceae	**Buttercup Family**																		
Caltha palustris	Marsh-marigold	5	-5		S5				U						X				
Ranunculus acris	Tall Buttercup		-2	-2	SE5				X								X		
Rhamnaceae	**Buckthorn Family**																		
Rhamnus cathartica	Common Buckthorn		3	-3	SE5				X			X				X	X	X	
Frangula alnus	Glossy Buckthorn		-1	-3	SE5				X								X		
Rosaceae	**Rose Family**																		
Agrimonia gryposepala	Tall Hairy Agrimony	2	2		S5				X								X		
Crataegus pruinosa var. dissona	Hawthorn									X									
Fragaria virginiana	Wild Strawberry				S5								X			X	X		X
Geum sp.	Avens sp.											X				X	X	X	X
Potentilla recta	Rough-fruited Cinquefoil		5	-2	SE5				X							X			
Prunus serotina	Black Cherry	3	3		S5				X						X				
Prunus virginiana ssp. virginiana	Choke Cherry	2	1		S5				X				X			X	X		X
Pyrus communis	Common Pear		5	-1	SE4				X			X							
Rosa multiflora	Multiflora Rose		3	-3	SE4				X						X	X	X	X	
Rubus idaeus ssp. melanolasius	Wild Red Raspberry	0	-2		S5				X								X		X
Waldsteinia fragarioides	Barren Strawberry	5	5		S5				U								X		
Rubiaceae	**Madder Family**																		
Galium mollugo	White Bedstraw		5	-2	SE5				X			X						X	
Rutaceae	**Rue Family**																		
Zanthoxylum americanum	American Prickly-ash	3	5		S5				X							X			
Salicaceae	**Willow Family**																		
Populus deltoides ssp. deltoides	Eastern Cottonwood	4	-1		S5				U			X	X				X	X	
Populus grandidentata	Large-tooth Aspen	5	3		S5				X								X		
Populus tremuloides	Trembling Aspen	2	0		S5				X								X		X
Salix alba var. vitellina	Weeping Willow				SU									X					
Salix bebbiana	Long-beaked Willow	4	-4		S5				X								X		
Salix fragilis	Crack Willow		-1	-3	SE5				X						X				
Salix petiolaris	Slender Willow	3	-4		S5				X								X		
Scrophulariaceae	**Figwort Family**																		
Verbascum thapsus	Common Mullein		5	-2	SE5				X							X			
Solanaceae	**Nightshade Family**																		
Solanum dulcamara	Bitter Nightshade		0	-2	SE5				X							X			
Tiliaceae	**Linden Family**																		
Tilia americana	American Basswood	4	3		S5				X						X	X	X	X	
Ulmaceae	**Elm Family**																		
Ulmus americana	White Elm	3	-2		S5				X			X		X	X				
Violaceae	**Violet Family**																		
Viola sororia	Woolly Blue Violet	4	1		S5				X							X	X		
Vitaceae	**Grape Family**																		
Parthenocissus vitacea	Woodbine	3	3		S5				X							X	X		X
Vitis riparia	Riverbank Grape	0	-2		S5				X							X	X		X
Carex careyana	Carey's Sedge	10	5		S2				R3	X									

Scientific Name	Common Name	CC	CW	Weed	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region[5]	NHIC[6]	Halton Region Species at Risk (OMNRF)[7]	NRSI Observed							
Monocotyledons	**Monocots**																		
Liliaceae	**Lily Family**																		
Allium tricoccum	Wild Leek	7	2		S5				X							X			
Erythronium americanum ssp. americanum	Yellow Dog's-tooth Violet	5	5		S5				X							X			
Poaceae	**Grass Family**																		
Bromus inermis ssp. inermis	Awnless Brome		5	-3	SE5				X			X		X		X			
Dactylis glomerata	Orchard Grass		3	-1	SE5				X								X		
Phalaris arundinacea	Reed Canary Grass	0	-4		S5				X			X		X	X		X		
Phragmites australis ssp. australis	European Common Reed				SNA							X			X				
Typhaceae	**Cattail Family**																		
Typha angustifolia	Narrow-leaved Cattail	3	-5		S5				X			X		X					
Typha latifolia	Broad-leaved Cattail	3	-5		S5				X						X				
										2	**7**	**21**	**17**	**11**	**20**	**43**	**48**	**18**	**31**

[1]OMNR 2013c; [2]MNRF 2013a; [3]COSEWIC 2012; [4]Government of Canada 2015; [5]Varga 2000; [6]OMNR 2013b; [7]MNRF 2015

LEGEND
SRANK
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
S#? Rank Uncertain
COSSARO/COSEWIC
END/E Endangered
THR/T Threatened
SC Special Concern
SARA Schedule
Schedule 1 Officially Protected under SARA
Halton Region
X Common native species or an introduced species that is present
U Uncommon Native Species
R Rare Native Species
Headings
CC Coefficient of Conservatism
CW Wetness Index
Weed Weediness Index

Bird Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region Species at Risk[5]	OBBA[6] 17NJ92	NHIC Data[7] 17NJ9426	NRSI Observed
Anatidae	**Ducks, Geese & Swans**								
Branta canadensis	Canada Goose	S5					CONF		CO
Aix sponsa	Wood Duck	S5					PROB		PO
Anas platyrhynchos	Mallard	S5					CONF		
Phalacrocoracidae	**Cormorants**								
Phalacrocorax auritus	Double-crested Cormorant	S5B	NAR	NAR					X
Ardeidae	**Herons & Bitterns**								
Butorides virescens	Green Heron	S4B					PROB		
Cathartidae	**Vultures**								
Cathartes aura	Turkey Vulture	S5B							X
Accipitridae	**Hawks, Kites, Eagles & Allies**								
Circus cyaneus	Northern Harrier	S4B	NAR	NAR			CONF		
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR			CONF		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR			CONF		PR
Charadriidae	**Plovers**								
Charadrius vociferus	Killdeer	S5B, S5N					CONF		PR
Scolopacidae	**Sandpipers, Phalaropes & Allies**								
Actitis macularia	Spotted Sandpiper	S5					CONF		PO
Bartramia longicauda	Upland Sandpiper	S4B					POSS		
Scolopax minor	American Woodcock	S4B					POSS		
Laridae	**Gulls, Terns & Skimmers**								
Larus delawarensis	Ring-billed Gull	S5B, S4N							X
Larus argentatus	Herring Gull	S5B, S5N							X
Hydroprogne caspia	Caspian Tern	S3B	NAR	NAR					X
Columbidae	**Pigeons & Doves**								
Columba livia	Rock Pigeon	SNA					CONF		PR
Zenaida macroura	Mourning Dove	S5					CONF		PR
Cuculiformes	**Cuckoos & Anis**								
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B					POSS		
Strigidae	**Typical Owls**								
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR			POSS		
Apodidae	**Swifts**								
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1		POSS		

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region Species at Risk[5]	OBBA[6] 17NJ92	NHIC Data[7]	NRSI Observed
Trochilidae	**Hummingbirds**								
Archilochus colubris	Ruby-throated Hummingbird	S5B							PO
Alcedinidae	**Kingfishers**								
Megaceryle alcyon	Belted Kingfisher	S4B					POSS		
Picidae	**Woodpeckers**								
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1		CONF		
Picoides pubescens	Downy Woodpecker	S5					POSS		PO
Picoides villosus	Hairy Woodpecker	S5					CONF		X
Colaptes auratus	Northern Flicker	S4B					POSS		PO
Dryocopus pileatus	Pileated Woodpecker	S5					POSS		
Falconidae	**Caracaras & Falcons**								
Falco sparverius	American Kestrel	S4					POSS		
Tyrannidae	**Tyrant Flycathers**								
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		X	POSS		PR
Empidonax alnorum	Alder Flycatcher	S5B					POSS		
Empidonax traillii	Willow Flycatcher	S5B					PROB		PO
Empidonax minimus	Least Flycatcher	S4B					POSS		
Sayornis phoebe	Eastern Phoebe	S5B							PO
Myiarchus crinitus	Great Crested Flycatcher	S4B					PROB		PO
Tyrannus tyrannus	Eastern Kingbird	S4B					CONF		PR
Vireonidae	**Vireos**								
Vireo gilvis	Warbling Vireo	S5B					PROB		PR
Vireo olivaceus	Red-eyed Vireo	S5B					POSS		PO
Corvidae	**Crows & Jays**								
Cyanocitta cristata	Blue Jay	S5					CONF		CO
Corvus brachyrhynchos	American Crow	S5B					CONF		PR
Alaudidae	**Larks**								
Eremophila alpestris	Horned Lark	S5B					POSS		PR

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region Species at Risk[5]	OBBA[6] 17NJ92	NHIC Data[7]	NRSI Observed
Hirundinidae	**Swallows**								
Progne subis	Purple Martin	S4B					PROB		
Tachycineta bicolor	Tree Swallow	S4B					CONF		PO
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					CONF		X
Petrochelidon pyrrhonota	Cliff Swallow	S4B					CONF		
Hirundo rustica	Barn Swallow	S4B	THR	T		X	PROB		PR
Paridae	**Chickadees & Titmice**								
Poecile atricapillus	Black-capped Chickadee	S5					CONF		PR
Sittidae	**Nuthatches**								
Sitta carolinensis	White-breasted Nuthatch	S5					POSS		PO
Troglodytidae	**Wrens**								
Thryothorus ludovicianus	Carolina Wren	S4							X
Troglodytes aedon	House Wren	S5B					CONF		PR
Cistothorus palustris	Marsh Wren	S4B					POSS		
Regulidae	**Kinglets**								
Regulus calendula	Ruby-crowned Kinglet	S4B							X
Turdidae	**Thrushes**								
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR			PROB		CO
Catharus guttatus	Hermit Thrush	S5B							X
Hylocichla mustelina	Wood Thrush	S4B	SC	T			PROB		
Turdus migratorius	American Robin	S5B					CONF		CO
Mimidae	**Mockingbirds, Thrashers & Allies**								
Dumetella carolinensis	Gray Catbird	S4B					PROB		PO
Toxostoma rufum	Brown Thrasher	S4B					PROB		PO
Mimus polyglottos	Northern Mockingbird	S4					CONF		
Sturnidae	**Starlings**								
Sturnus vulgaris	European Starling	SNA					CONF		CO
Bombycillidae	**Waxwings**								
Bombycilla cedrorum	Cedar Waxwing	S5B					CONF		PR

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region Species at Risk[5]	OBBA[6] 17NJ92	NHIC Data[7]	NRSI Observed
Parulidae	**Wood Warblers**								
Parkesia noveboracensis	Northern Waterthrush	S5B					POSS		
Mniotilta varia	Black-and-white Warbler	S5B							X
Geothylpis philadelphia	Mourning Warbler	S4B					CONF		
Geothylpis trichas	Common Yellowthroat	S5B					PROB		PO
Setophaga petechia	Yellow Warbler	S5B					CONF		PO
Setophaga palmarum	Palm Warbler	SNRB							X
Setophaga coronata	Yellow-rumped Warbler	S5B							X
Emberizidae	**New World Sparrows & Allies**								
Pipilo erythrophthalmus	Eastern Towhee	S4B					POSS		
Spizella passerina	Chipping Sparrow	S5B					PROB		PO
Spizella pusilla	Field Sparrow	S4B					POSS		
Pooecetes gramineus	Vesper Sparrow	S4B							X
Passerculus sandwichensis	Savannah Sparrow	S4B					CONF		PR
Melospiza melodia	Song Sparrow	S5B					CONF		CO
Melospiza georgiana	Swamp Sparrow	S5B					PROB		
Cardinalidae	**Cardinals, Grosbeaks & Allies**								
Piranga olivacea	Scarlet Tanager	S4B					CONF		
Cardinalis cardinalis	Northern Cardinal	S5					PROB		PR
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					PROB		PO
Passerina cyanea	Indigo Bunting	S4B					CONF		PR
Icteridae	**Blackbirds**								
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	X	CONF	X	PO
Agelaius phoeniceus	Red-winged Blackbird	S4					CONF		CO
Sturnella magna	Eastern Meadowlark	S4B	THR	T		X	PROB		X
Quiscalus quiscula	Common Grackle	S5B					CONF		CO
Molothrus ater	Brown-headed Cowbird	S4B					CONF		PR
Icterus spurius	Orchard Oriole	S4B					PROB		
Icterus galbula	Baltimore Oriole	S4B					CONF		PO

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Region Species at Risk[5]	OBBA[6] 17NJ92	NHIC Data[7]	NRSI Observed
Fringillidae	**Finches & Allies**								
Carpodacus mexicanus	House Finch	SNA					CONF		
Spinus tristis	American Goldfinch	S5B					PROB		PR
Passeridae	**Old World Sparrows**								
Passer domesticus	House Sparrow	SNA					CONF		X
					Total	**4**	**75**	**1**	**61**

[1]OMNR 2013c; [2]OMNR 2013b; [3]COSEWIC 2012; [4]Government of Canada 2015; [5]OMNRF 2015; [6]BSC 2006; [7]OMNR 2013b

LEGEND
SRANK
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked
COSSARO
THR Threatened
SC Special Concern
NAR Not at Risk
COSEWIC
T Threatened
SC Special Concern
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA

Breeding Evidence Codes
Observed
X Species observed in its breeding season with no evidence of breeding
Possible
H Species observed in its breeding season in suitable nesting habitat
S Singing male present of breeding calls heard in breeding season in suitable nesting habitat
Probable
P Pair observed in their breeding season in suitable nesting habitat
T Permanent territory presumed through registration of territorial song on at least 2 days, one week or place
D Courtship or display between a male and female or 2 males including courtship feeding and copulat
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult
B Brood patch on adult female or cloacal protuberance on adult male
N Nest building or excavation of nest site
Confirmed
DD Distraction display or injury feigning
NU Used nest or egg shell found (occupied/laid this season)
FY Recently fledged young or downy young
AE Adults leaving or entering nest site in circumstances indicating occupied nest
FS Adult carrying faecal sac
CF Adult carrying food for young
NE Nest containing eggs
NY Nest with young seen or heard

Reptile and Amphibian Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Region of Halton Species at Risk (OMNRF)	Ontario Reptile and Amphibian Atlas[5] (17NJ92)	NHIC Data[6]	NRSI Observed
Turtles									
Chelydra serpentina serpentina	Snapping Turtle	S3	SC	SC	Schedule 1	X	HISTORIC		
Chrysemys picta marginata	Midland Painted Turtle	S5					HISTORIC		X
Snakes									
Lampropeltis taylori triangulum	Eastern Milksnake	S3	SC	SC	Schedule 1	X	HISTORIC		
Opheodrys vernalis	Smooth Greensnake	S4					HISTORIC		
Storeria dekayi dekayi	Northern Brownsnake	S5	NAR	NAR			HISTORIC		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					X		
Salamanders									
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	Schedule 1	X	HISTORIC		
Ambystoma maculatum	Spotted Salamander	S4					HISTORIC		
Necturus maculosus	Mudpuppy	S4	NAR	NAR			HISTORIC		
Plethodon cinereus	Eastern Red-backed Salamander	S5					HISTORIC		
Toads and Frogs									
Anaxyrus americanus	American Toad	S5					X		X
Hyla versicolor	Tetraploid Gray Treefrog	S5					HISTORIC		X
Pseudacris triseriata pop. 2	Western Chorus Frog *(Great Lakes/St. Lawrence - Canadian Shield Population)*	S3	NAR	T	Schedule 1		X		
Pseudacris crucifer	Spring Peeper	S5					X		X
Lithobates clamitans melanota	Northern Green Frog	S5					HISTORIC		X
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR			X		
Lithobates sylvatica	Wood Frog	S5					X		
					Total	**3**	**17**	**0**	**5**

[1]OMNR 2013a; [2]OMNR 2013b; [3]COSEWIC 2012; [4]Government of Canada 2012; [5]Ontario Nature 2013; [6]OMNR 2013c

Legend
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
COSSARO
END Endangered
SC Special Concern
NAR Not at Risk
COSEWIC
E Endangered
T Threatened
SC Special Concern
NAR Not at Risk
SARA Schedule
Schedule 1 Officially Protected under SARA

Mammal Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Region of Halton Status[5]	Region of Halton Species at Risk	Ontario Mammal Atlas[6]	NHIC Data[7]	NRSI Observed
Didelphimorphia	**Opossums**									
Didelphis virginiana	Virginia Opossum	S4				C		X		
Insectivora	**Shrews and Moles**									
Condylura cristata	Star-nosed Mole	S5				C		HISTORIC		
Sorex fumeus	Smoky Shrew	S5				C		HISTORIC		
Chiroptera	**Bats**									
Eptesicus fuscus	Big Brown Bat	S5				C		X		X
Myotis lucifugus	Little Brown Myotis	S4	END	E	Schedule 1	C		HISTORIC		
Perimyotis subflavus	Tri-colored Bat	S3?		E	Schedule 1			HISTORIC		
Lagomorpha	**Rabbits and Hares**									
Lepus europaeus	European Hare	SNA				C		X		
Rodentia	**Rodents**									
Castor canadensis	Beaver	S5				C		X		
Erethizon dorsatum	Porcupine	S5				C		X		
Marmota monax	Woodchuck	S5				C		X		
Microtus pennsylvanicus	Meadow Vole	S5				C		X		
Ondatra zibethicus	Muskrat	S5				C		X		
Peromyscus leucopus	White-footed Mouse	S5				C		X		
Peromyscus maniculatus	Deer Mouse	S5				C		X		
Sciurus carolinensis	Eastern Gray Squirrel	S5				C		X		X
Synaptomys cooperi	Southern Bog Lemming	S4						HISTORIC		
Zapus hudsonius	Meadow Jumping Mouse	S5				C		HISTORIC		
Carnivora	**Carnivores**									
Canis latrans	Coyote	S5				C		X		X
Mephitis mephitis	Striped Skunk	S5				C		X		
Mustela vison	American Mink	S4				C		X		
Procyon lotor	Northern Raccoon	S5				C		X		X
Vulpes vulpes	Red Fox	S5				C		X		
Artiodactyla	**Deer and Bison**									
Odocoileus virginianus	White-tailed Deer	S5				C		X		X
					Total	**21**	**0**	**23**	**0**	**5**

[1]OMNR 2013a; [2]OMNR 2013b; [3]COSEWIC 2012; [4]Government of Canada 2012; [5]Conservation Halton 2007; [6]Dobbyn 1994, [7]OMNR 2013c

Legend
SRANK
S4 Apparently Secure
S5 Secure
COSSARO
END Endangered
COSEWIC
E Endangered
SARA Schedule
Schedule 1 Officially Protected under SARA
Halton Status (Halton Natural Areas Inventory)
C Common

Butterfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Status[5]	TEA Atlas[6] (17NJ92)	NHIC Data[7]	NRSI Observed
Hesperiidae	**Skippers**								
Ancyloxypha numitor	Least Skipper	S5				C	X		
Carterocephalus palaemon	Arctic Skipper	S5				C	X		
Erynnis icelus	Dreamy Duskywing	S5				C	X		
Erynnis juvenalis	Juvenal's Duskywing	S5				C	X		
Polites mystic	Long Dash Skipper	S5				C	X		
Polites themistocles	Tawny-edged Skipper	S5				C	X		
Papilionidae	**Swallowtails**								
Papilio canadensis	Canadian Tiger Swallowtail	S5					X		
Papilio glaucus	Eastern Tiger Swallowtail	S5				C	X		
Papilio polyxenes	Black Swallowtail	S5				C	X		
Pieridae	**Whites and Sulphurs**								
Colias philodice	Clouded Sulphur	S5				C	X		
Pieris rapae	Cabbage White	SNA				C	X		X
Pieris virginiensis	West Virginia White	S3		SC		C	X		
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**								
Celastrina ladon	Spring Azure	S5				C	X		
Lycaena hyllus	Bronze Copper	S5				UC	X		
Satyrium calanus	Banded Hairstreak	S4				C	X		
Satyrium caryaevorus	Hickory Hairstreak	S4				C	X		
Satyrium titus	Coral Hairstreak	S5				UC	X		
Nymphalidae	**Brush-footed Butterflies**								
Coenonympha tullia	Common Ringlet	S5				C	X		
Danaus plexippus	Monarch	S2N, S4B	SC	SC	Schedule 1	C	X		X
Limenitis archippus	Viceroy	S5				C	X		
Limentis arthemis astyanax	Red-spotted Purple	S5				C	X		
Megisto cymela	Little Wood-Satyr	S5				C	X		
Nymphalis antiopa	Mourning Cloak	S5				C	X		
Phyciodes cocyta	Northern Crescent	S5					X		
Polygonia comma	Eastern Comma	S5				C	X		
Speyeria cybele	Great Spangled Fritillary	S5				C	X		
Vanessa atalanta	Red Admiral	S5				C			X
					Total	**25**	**26**	**0**	**3**

[1]OMNR 2013c; [2]OMNR 2013b; [3]COSEWIC 2012; [4]Government of Canada 2012; [5]Wormington 2006; [6]Jones et al. 2013, [7]OMNR 2013b

LEGEND
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked
COSSARO
SC Special Concern
COSEWIC
SC Special Concern
SARA Schedule
Schedule 1 Officially Protected under SARA
Halton Region Status
C Common
UC Uncommon

Dragonfly and Damselfly Species Reported From the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Halton Status[5]	NRSI Observed
Coenagrionidae	**Narrow-winged Damselflies**						
Ischnura verticalis	Eastern Forktail	S5				C	X
Aeshnidae	**Darners**						
Anax junius	Common Green Darner	S5				C	X
Corduliidae	**Emeralds**						
Epitheca canis	Beaverpond Baskettail	S5				U	X
Libellulidae	**Skimmers**						
Libellula luctuosa	Widow Skimmer	S5				C	X
Pachydiplax longipennis	Blue Dasher	S5				C	X
Tramea lacerata	Black Saddlebags	S4				C	X
					Total		**6**

[1]OMNR 2010; [2]OMNR 2012; [3]COSEWIC 2012; [4]Government of Canada 2012; [5]Conservation Halton 2007

LEGEND
SRANK
S4 Apparently Secure
S5 Secure
Halton Status (Halton Natural Areas Inventory)
C Common
Un Uncommon

Fish Species Reported from the Study Area

Scientific Name	Common Name	SRANK[1]	OMNR[2]	COSEWIC[3]	SARA Schedule[4]	Region Species at Risk	NHIC Data[#] (17NJ9425)	NRSI Observed
Petromyzontidae	**Lampreys**							
Lampetra appendix	American Brook Lamprey	S3						X
Cyprinidae	**Carps and Minnows**							
Chrosomus eos	Northern Redbelly Dace	S5						X
Clinostomus elongatus	Redside Dace	S2	END	E (April 2007)	Schedule 3	X	X	
Luxilus cornutus	Common Shiner	S5						X
Notropis hudsonius	Spottail Shiner	S5						X
Pimephales notatus	Bluntnose Minnow	S5	NAR	NAR (April 1998)				X
Pimephales promelas	Fathead Minnow	S5						X
Rhinichthys obtusus	Western Blacknose Dace	SNR						X
Semotilus atromaculatus	Creek Chub	S5						X
Catostomidae	**Suckers**							
Catostomus commersonii	White Sucker	S5						X
Ictaluridae	**North American Catfishes**							
Ameiurus natalis	Yellow Bullhead	S4						X
Salmonidae	**Trouts and Salmons**							
Salvelinus fontinalis	Brook (Speckled) Trout	S5						X
Gasterosteidae	**Sticklebacks**							
Culaea inconstans	Brook Stickleback	S5						X
Centrarchidae	**Sunfishes and Basses**							
Micropterus dolomieu	Smallmouth Bass	S5						X
Percidae	**Perches and Darters**							
Etheostoma caeruleum	Rainbow Darter	S4						X
Etheostoma exile	Iowa Darter	S5						X
Etheostoma flabellare	Fantail Darter	S4						X
Etheostoma nigrum	Johnny Darter	S5						X
						Total	**1**	**16**

[1]OMNR 2013a; [2]OMNR 2013b; [3]COSEWIC 2012; [4]Government of Canada 2012; [#]OMNRF 2015

Legend
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SNA Unranked
SU Unrankable
COSSARO
NAR Not at Risk
END Endangered
COSEWIC
NAR Not at Risk
E Endangered
SARA Schedule
Schedule 3 Special concern; may be reassessed for consideration for inclusion to Schedule 1

ORDER	FAMILY	Genus	BTH-001 Riffle 1	BTH-001 Pool	BTH-001 Riffle 2	BTH-002 Riffle 1	BTH-002 Pool	BTH-002 Riffle 2	BTH-003 Pool	BTH-003 Riffle 2	BTH-003 Riffle 1	BTH-004 Pool	BTH-004 Riffle 1	BTH-004 Riffle 2	BTH-005 Riffle 1	BTH-005 Riffle 2	BTH-005 Pool
ISOPODA	Asellidae	Caecidotea	6	11	9	5	10	11	4	12	23		3	8	19	10	
EPHEMEROPTERA	Baetidae	Baetis	7		16	7		7					2	11		19	
	Caenidae	Caenis			1	2	14	2	3		5	7			1	2	3
	Heptageniidae	Maccaffertium					1							1			
PLECOPTERA	Nemouridae	Nemoura	3		5					3			3			1	
	Chloroperlidae	Suwallia												1			
	Perlidae	Neoperla				7		7		6							
DIPTERA	Empididae	Hemerodromia	2			5				8				3			2
	Tabanidae	Chrysops	2	11	17	6				1			2	1		2	
	Tipulidae	Tipula	1					1		2							
	Ptychopteridae	Ptychoptera		2													
	Ceratopogonidae	Type A		1			2		2								
	Simulidae	Simulium			2	20		1		4						4	
	Chironomidae	Hydrobaenus			5	10	17	22	5	10			10	4	2		
		Clinotanypus	11	10	7		11	12	14	21	25	13	4		20		
		Thienemanniella				3	4	6	5	5	3						
		Lopescladius		3	3		17			3	2	10					4
		Tanypus	33	14	17	5	27	22	45	25	32	30	12	14	22	10	23
		Lauterborniella	15	20	31	17	10	37	20	14	11	5	13	4	17	5	14
		Stictochironomus					4		15	18	25	10	4	9	9		7
		Paramerina				12	24	17	5		7	1	17	21		4	2
		Cladopelma	11	6	7		14			3			2	4			
		Parakiefferiella	5				10		6	5	3		4	10			
		Cryptochironomus					25		7	15	5	7	15			5	
		Pseudorthocladius	10	6	15	4		9	12	7	16	10			20		10
		Natarsia	13		3	8	5	10	10		1		4				
		Diplocladius			2		4				4	5		6			
COLEOPTERA	Elmidae	Ordobrevia	3	1	5	20		9	3	16	2	4	5	1	20	9	11
		Optioservus		1				2			2		1	8			
		Dubiraphia					42	3	28		24	30			49	6	32
	Dytiscidae	Agabetes				1	5	1			2					1	
	Psephenidae	Psephenus					1										
TRICOPTERA	Hydropsychidae	Hydropsyche	4		3	5		5	2	5			3		2	4	
		Cheumatopsyche	3		2					4	7		2	2			
	Glossosomatidae	Glossosoma		1												3	
	Hydroptilidae	Hydroptila			7	18		4		2			3	1		1	1
	Leptoceridae	Oecetis				1											
	Polycentropodidae	Polycentropus								1							
VENEROIDA	Sphaeriidae	Musculium		10		2											
		Sphaerium		14	1	7	1		6	5	6	2	1	2	1		1
		Pisidium				3			5		3						
RHYNCHOBDELLIDA	Glossiphoniidae	Glossiphonia		1		1											
TROMBIDIFORMES	Mideopsidae	Mideopsis			1			1								1	
	Lebertiidae	Lebertia												1			
DECAPODA	Cambaridae	Orconectes				3					3						
ODONATA	Calopterygidae	Calopteryx									2						
AMPHIPODA	Gammaridae	Gammarus										2			50	26	
Total			129	112	159	172	248	189	197	195	213	136	110	112	232	113	110
Proportion Sub-sampled			6.7%	12.9%	7.7%	5.6%	4.8%	10.0%	22.2%	8.3%	9.1%	11.8%	5.3%	7.1%	14.8%	21.1%	31.6%

Benthic Metric Calculation Tables by Monitoring Station

BTH-001

Metric		BTH-001					
		Riffle 1		Pool		Riffle	
Taxa Richness		16		16		21	
EPT Richness		4		1		6	
% EPT		13.18		0.89		21.38	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	79.84		65.18		65.55	
	% Chironomidae	75.97		52.68		56.60	
	% Gastropoda	0		0		0	
	% Insecta	95.35		67.86		93.08	
	% Isopoda	5		10		6	
Shannon Wiener Index		2.412		2.407		2.638	
Simpson's Diversity Index		0.8806		0.8945		0.906	
Family Biotic Index		7.233	Poor	7.661	Very Poor	6.723	Poor
Hilsenhoff Biotic Index		7.19	Fairly Poor	6.91	Fairly Poor	6.31	Fair

BTH-002

Metric		BTH-002					
		Riffle 1		Pool		Riffle	
Taxa Richness		24		21		21	
EPT Richness		6		2		5	
% EPT		23.26		6.05		13.23	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	52.33		70.16		72.49	
	% Chironomidae	34.30		69.35		71.43	
	% Gastropoda	0		0		0	
	% Insecta	87.79		95.56		93.65	
	% Isopoda	3		4		6	
Shannon Wiener Index		2.87		2.68		2.63	
Simpson's Diversity Index		0.93		0.92		0.91	
Family Biotic Index		6.14	Fairly Poor	7.16	Poor	7.03	Poor
Hilsenhoff Biotic Index		5.99	Fair	7.06	Fairly Poor	6.91	Fairly Poor

BTH-003

Metric		BTH-003					
		Riffle 1		Pool		Riffle	
Taxa Richness		23		19		24	
EPT Richness		2		2		6	
% EPT		5.63		2.57		10.77	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	62.91		74.11		72.31	
	% Chironomidae	62.91		73.10		64.62	
	% Gastropoda	0		0		0	
	% Insecta	83.57		92.39		91.28	
	% Isopoda	11		2		6	
Shannon Wiener Index		2.68		2.56		2.87	
Simpson's Diversity Index		0.91		0.89		0.93	
Family Biotic Index		7.26	Very Poor	7.29	Very Poor	6.94	Poor
Hilsenhoff Biotic Index		7.03	Fairly Poor	7.29	Fairly Poor	6.93	Fairly Poor

BTH-004

Metric		BTH-004					
		Riffle 1		Pool		Riffle	
Taxa Richness		20		21		20	
EPT Richness		5		2		5	
% EPT		11.82		6.05		14.29	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	79.09		70.16		67.86	
	% Chironomidae	77.27		69.35		64.29	
	% Gastropoda	0		0		0	
	% Insecta	96.36		95.56		97.06	
	% Isopoda	3		0		7	
Shannon Wiener Index		2.66		2.68		2.60	
Simpson's Diversity Index		0.91		0.92		0.91	
Family Biotic Index		7.22	Poor	7.16	Poor	7.01	Poor
Hilsenhoff Biotic Index		7.13	Fairly Poor	7.06	Fairly Poor	6.80	Fairly Poor

BTH-005

Metric		BTH-005					
		Riffle 1		Pool		Riffle	
Taxa Richness		13		21		18	
EPT Richness		2		2		6	
% EPT		1.29		3.64		26.55	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	38.79		56.36		26.55	
	% Chironomidae	38.79		54.55		21.24	
	% Gastropoda	0		0		0	
	% Insecta	69.83		99.09		67.26	
	% Isopoda	8		0		9	
Shannon Wiener Index		2.17		2.02		2.46	
Simpson's Diversity Index		0.86		0.83		0.88	
Family Biotic Index		5.91	Fairly Poor	6.34	Fairly Poor	5.27	Fair
Hilsenhoff Biotic Index		6.38	Fair	6.56	Fairly Poor	6.29	Fair

Summary

Index	BTH-001 Pooled	BTH-002 Pooled	BTH-003 Pooled	BTH-004 Pooled	BTH-005 Pooled
EPT Richness	Potentially Impaired	Potentially Impaired	Potentially Impaired	Potentially Impaired	Potentially Impaired
Taxa Richness	Unimpaired	Unimpaired	Unimpaired	Unimpaired	Unimpaired
% Oligochaeta	Unimpaired	Unimpaired	Unimpaired	Unimpaired	Unimpaired
% Chironomidae	Impaired	Impaired	Impaired	Impaired	Impaired
% Isopoda	Impaired	Potentially Impaired	Impaired	Potentially Impaired	Potentially Impaired
% Diptera	Impaired	Impaired	Impaired	Impaired	Unimpaired
% Insecta	Potentially Impaired	Impaired	Potentially Impaired	Impaired	Impaired
HFI	Impaired	Potentially impaired	Impaired	Impaired	Unimpaired
SDI	Impaired	Impaired	Impaired	Impaired	Impaired

ORDER	FAMILY	Genus	BTH-001 Riffle 1	BTH-001 Pool	BTH-001 Riffle 2	BTH-002 Riffle 1	BTH-002 Pool	BTH-002 Riffle 2	BTH-003 Pool	BTH-003 Riffle 2	BTH-003 Riffle 1	BTH-004 Pool	BTH-004 Riffle 1	BTH-004 Riffle 2	BTH-005 Riffle 1	BTH-005 Riffle 2	BTH-005 Pool
ISOPODA	Asellidae	Caecidotea	6	11	9	5	10	11	4	12	23		3	8	19	10	
EPHEMEROPTERA	Baetidae	Baetis	7		16	7		7					2	11		19	
	Caenidae	Caenis			1	2	14	2	3		5	7			1	2	3
	Heptageniidae	Maccaffertium					1							1			
PLECOPTERA	Nemouridae	Nemoura	3		5					3			3			1	
	Chloroperlidae	Suwallia												1			
	Perlidae	Neoperla				7		7		6							
DIPTERA	Empididae	Hemerodromia	2			5				8				3			2
	Tabanidae	Chrysops	2	11	17	6				1			2	1		2	
	Tipulidae	Tipula	1					1		2							
	Ptychopteridae	Ptychoptera		2													
	Ceratopogonidae	Type A		1			2		2								
	Simulidae	Simulium			2	20		1		4						4	
	Chironomidae	Hydrobaenus			5	10	17	22	5	10			10	4	2		
		Clinotanypus	11	10	7		11	12	14	21	25	13	4		20		
		Thienemanniella				3	4	6	5	5	3						
		Lopescladius		3	3		17			3	2	10					4
		Tanypus	33	14	17	5	27	22	45	25	32	30	12	14	22	10	23
		Lauterborniella	15	20	31	17	10	37	20	14	11	5	13	4	17	5	14
		Stictochironomus					4		15	18	25	10	4	9	9		7
		Paramerina				12	24	17	5		7	1	17	21		4	2
		Cladopelma	11	6	7		14			3			2	4			
		Parakiefferiella	5				10		6	5	3		4	10			
		Cryptochironomus					25		7	15	5	7	15			5	
		Pseudorthocladius	10	6	15	4		9	12	7	16	10			20		10
		Natarsia	13		3	8	5	10	10		1		4				
		Diplocladius			2		4				4	5		6			
COLEOPTERA	Elmidae	Ordobrevia	3	1	5	20		9	3	16	2	4	5	1	20	9	11
		Optioservus		1				2			2		1	8			
		Dubiraphia					42	3	28		24	30			49	6	32
	Dytiscidae	Agabetes				1	5	1			2					1	
	Psephenidae	Psephenus					1										
TRICOPTERA	Hydropsychidae	Hydropsyche	4		3	5		5	2	5			3		2	4	
		Cheumatopsyche	3		2					4	7		2	2			
	Glossosomatidae	Glossosoma		1												3	
	Hydroptilidae	Hydroptila			7	18		4		2			3	1		1	1
	Leptoceridae	Oecetis				1											
	Polycentropodidae	Polycentropus								1							
VENEROIDA	Sphaeriidae	Musculium		10		2											
		Sphaerium		14	1	7	1		6	5	6	2	1	2	1		1
		Pisidium				3			5		3						
RHYNCHOBDELLIDA	Glossiphoniidae	Glossiphonia		1		1											
TROMBIDIFORMES	Mideopsidae	Mideopsis			1			1								1	
	Lebertiidae	Lebertia												1			
DECAPODA	Cambaridae	Orconectes				3					3						
ODONATA	Calopterygidae	Calopteryx									2						
AMPHIPODA	Gammaridae	Gammarus										2			50	26	
Total			129	112	159	172	248	189	197	195	213	136	110	112	232	113	110
Proportion Sub-sampled			6.7%	12.9%	7.7%	5.6%	4.8%	10.0%	22.2%	8.3%	9.1%	11.8%	5.3%	7.1%	14.8%	21.1%	31.6%

Benthic Metric Calculation Tables by Monitoring Station

BTH-001

Metric		BTH-001					
		Riffle 1		Pool		Riffle	
Taxa Richness		16		16		21	
EPT Richness		4		1		6	
% EPT		13.18		0.89		21.38	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	79.84		65.18		65.55	
	% Chironomidae	75.97		52.68		56.60	
	% Gastropoda	0		0		0	
	% Insecta	95.35		67.86		93.08	
	% Isopoda	5		10		6	
Shannon Wiener Index		2.412		2.407		2.638	
Simpson's Diversity Index		0.8806		0.8945		0.906	
Family Biotic Index		7.233	Poor	7.661	Very Poor	6.723	Poor
Hilsenhoff Biotic Index		7.19	Fairly Poor	6.91	Fairly Poor	6.31	Fair

BTH-002

Metric		BTH-002					
		Riffle 1		Pool		Riffle	
Taxa Richness		24		21		21	
EPT Richness		6		2		5	
% EPT		23.26		6.05		13.23	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	52.33		70.16		72.49	
	% Chironomidae	34.30		69.35		71.43	
	% Gastropoda	0		0		0	
	% Insecta	87.79		95.56		93.65	
	% Isopoda	3		4		6	
Shannon Wiener Index		2.87		2.68		2.63	
Simpson's Diversity Index		0.93		0.92		0.91	
Family Biotic Index		6.14	Fairly Poor	7.16	Poor	7.03	Poor
Hilsenhoff Biotic Index		5.99	Fair	7.06	Fairly Poor	6.91	Fairly Poor

BTH-003

Metric		BTH-003					
		Riffle 1		Pool		Riffle	
Taxa Richness		23		19		24	
EPT Richness		2		2		6	
% EPT		5.63		2.57		10.77	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	62.91		74.11		72.31	
	% Chironomidae	62.91		73.10		64.62	
	% Gastropoda	0		0		0	
	% Insecta	83.57		92.39		91.28	
	% Isopoda	11		2		6	
Shannon Wiener Index		2.68		2.56		2.87	
Simpson's Diversity Index		0.91		0.89		0.93	
Family Biotic Index		7.26	Very Poor	7.29	Very Poor	6.94	Poor
Hilsenhoff Biotic Index		7.03	Fairly Poor	7.29	Fairly Poor	6.93	Fairly Poor

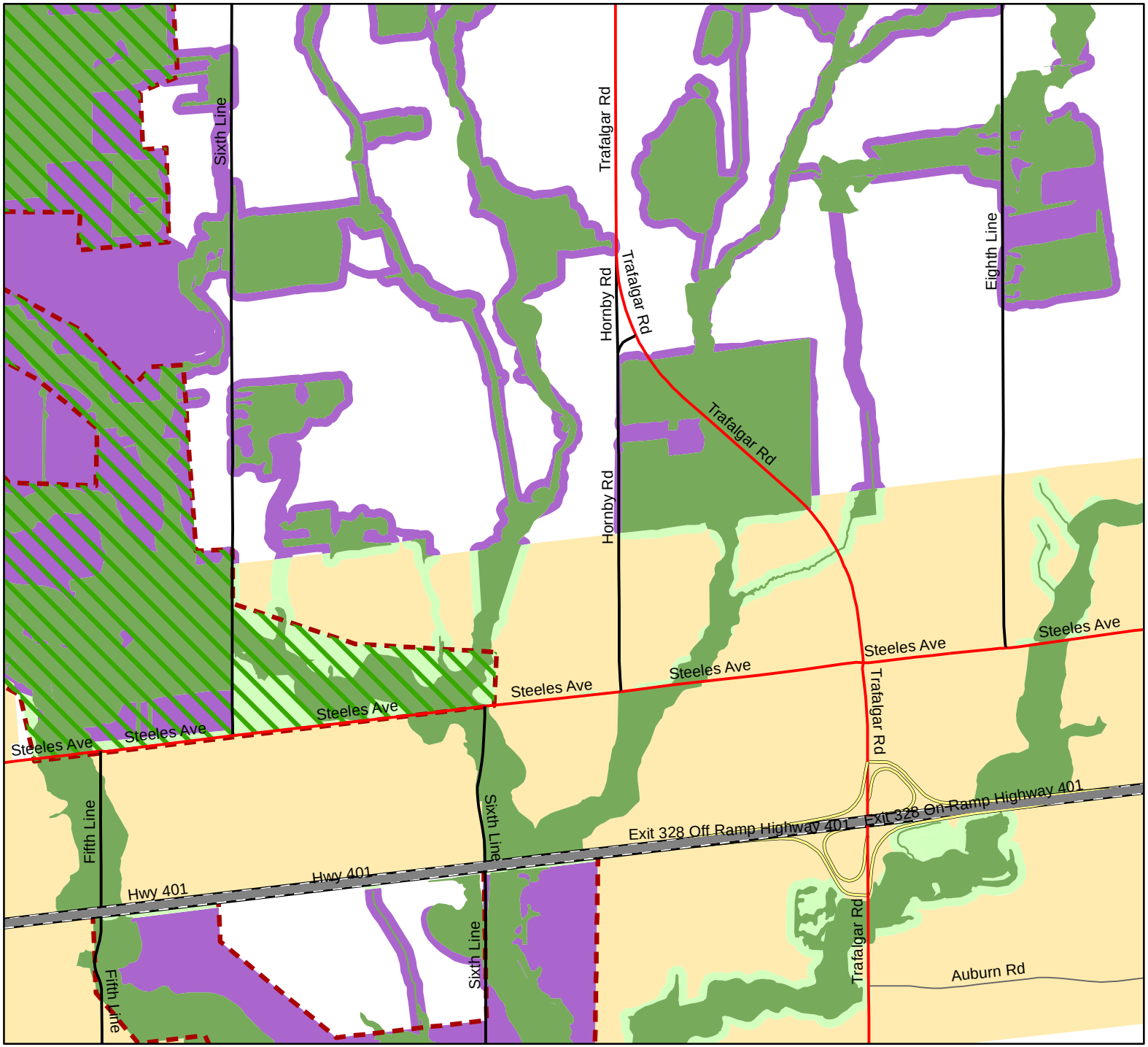
BTH-004

Metric		BTH-004					
		Riffle 1		Pool		Riffle	
Taxa Richness		20		21		20	
EPT Richness		5		2		5	
% EPT		11.82		6.05		14.29	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	79.09		70.16		67.86	
	% Chironomidae	77.27		69.35		64.29	
	% Gastropoda	0		0		0	
	% Insecta	96.36		95.56		97.06	
	% Isopoda	3		0		7	
Shannon Wiener Index		2.66		2.68		2.60	
Simpson's Diversity Index		0.91		0.92		0.91	
Family Biotic Index		7.22	Poor	7.16	Poor	7.01	Poor
Hilsenhoff Biotic Index		7.13	Fairly Poor	7.06	Fairly Poor	6.80	Fairly Poor

BTH-005

Metric		BTH-005					
		Riffle 1		Pool		Riffle	
Taxa Richness		13		21		18	
EPT Richness		2		2		6	
% EPT		1.29		3.64		26.55	
Tolerant Taxa Richness	% Oligochaetes	0		0		0	
	% Diptera	38.79		56.36		26.55	
	% Chironomidae	38.79		54.55		21.24	
	% Gastropoda	0		0		0	
	% Insecta	69.83		99.09		67.26	
	% Isopoda	8		0		9	
Shannon Wiener Index		2.17		2.02		2.46	
Simpson's Diversity Index		0.86		0.83		0.88	
Family Biotic Index		5.91	Fairly Poor	6.34	Fairly Poor	5.27	Fair
Hilsenhoff Biotic Index		6.38	Fair	6.56	Fairly Poor	6.29	Fair

Halton OP 2009, Map 1G



Legend

- Municipal Boundary
- Local Roads
- Regional Roads
- Other Major Roads
- On/Off Ramps
- Highways
- Greenbelt Natural Heritage System
- Greenbelt Plan Protected Countryside Boundary
- Map 1G NHS Key (Lines)
- Map1G NHS Key Features
- Enhancement Areas
- Prime Agricultural Lands in NHS Enhancements/Buffers

Map 1G Designations

Land Use

- Urban Area

0 0.1 0.2 0.4 0.6 0.8 KM

Appendix C

Hydrogeology

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
2809870	06/19/03	594740	4825631	201.70		Unknown									
2810036	07/16/04	594086	4825397	206.98		Unknown									
7039369	09/12/06	593446	4824185	195.19		Unknown									
7051753	10/27/07	593461	4823887	194.28		Unknown									
7051511	10/15/07	593467	4823759	195.00		Unknown									
7108794	07/15/08	593296	4824094	194.95	3.1	Unknown	0.90								
7120006	11/24/07	593626	4824722	198.15	7.6	Unknown		4.50	7.60						
7109237	07/17/08	593314	4824091	194.42	3.9	Unknown	3.00	0.90	3.90						
7151563	08/31/10	592523	4822909	195.43	3.3	Unknown	0.46	1.80	3.30						
7170234	08/10/11	594039	4825038	204.76		Unknown									
7170235	07/29/11	594140	4825375	205.98		Unknown									
7164664	04/14/11	594270	4825427	205.69		Unknown									
7166356	07/06/11	594650	4825916	207.83		Unknown									
7188928	05/31/12	594086	4825235	208.41		Unknown									
7179272	10/24/11	594205	4825357	205.89		Unknown									
7200756	03/18/13	594134	4825232	208.39		Unknown									
7199559	10/31/12	594091	4825236	208.62		Unknown									
7223176	06/11/12	594205	4825357	205.89		Unknown									
2800988	08/07/58	592554.5	4823383	200.01	5.8	Overburden	1.22			0.00	1.22	Topsoil			Brown
										1.22	1.52	Gravel			
										1.52	5.18	Clay	Stones		Grey
										5.18	5.79	Gravel			
2800989	06/09/60	592394.5	4823163	198.33	12.5	Overburden	9.75			0.00	4.57	Clay			Brown
										4.57	12.50	Clay	Medium Sand	Boulders	Red
2800998	04/13/66	591464.5	4824643	211.62	13.7	Overburden	6.71			0.00	6.10	Topsoil			Brown
										6.10	13.11	Clay	Medium Sand		Red
										13.11	13.72	Medium Sand			
2800999	07/13/65	591514.5	4824583	210.59	25.9	Bedrock	6.40			0.00	6.40	Clay			Yellow
										6.40	11.58	Clay			Grey
										11.58	13.41	Fine Sand	Clay		Red
										13.41	15.85	Medium Sand	Clay		Grey
										15.85	21.34	Clay	Medium Sand	Gravel	Grey
										21.34	22.25	Fine Sand			Grey
										22.25	24.08	Clay	Gravel		Red
										24.08	25.91	Shale			Red
2801087	08/30/54	592668.5	4823531	199.94	19.2	Overburden	3.05			0.00	1.52	Medium Sand			
										1.52	13.72	Clay			Blue
										13.72	19.20	Gravel	Clay		
2801088	12/05/67	592728.5	4823627	199.96	14	Overburden	3.66			0.00	3.66	Topsoil	Clay		Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										3.66	13.41	Clay			Grey
										13.41	14.02	Medium Sand			Grey
2801089	06/11/60	592215.5	4824425	210.17	8.5	Overburden	6.40			0.00	2.44	Clay	Medium Sand		Brown
										2.44	8.53	Clay	Boulders		Brown
2801090	11/03/62	592975.5	4825061	201.57	16.5	Overburden	6.10			0.00	3.66	Topsoil	Clay		Brown
										3.66	15.85	Clay	Stones		Grey
										15.85	16.46	Coarse Sand			
2801091	06/06/63	591944.5	4824241	209.82	12.8	Overburden	3.35			0.00	12.19	Topsoil	Clay		Brown
										12.19	12.80	Coarse Sand			
2801092	06/12/65	591932.5	4824256	210.36	18.3	Overburden	9.14			0.00	5.49	Topsoil	Clay		Brown
										5.49	17.98	Clay			Grey
										17.98	18.29	Medium Sand			
2801093	08/18/58	591541.5	4824640	211.87	38.1	Bedrock	7.01			0.00	0.30	Topsoil			Black
										0.30	3.66	Clay			Brown
										3.66	6.71	Clay			Grey
										6.71	8.53	Medium Sand	Clay	Stones	
										8.53	10.67	Clay			Grey
										10.67	12.80	Clay	Medium Sand		
										12.80	15.24	Clay	Stones		Grey
										15.24	20.42	Clay	Medium Sand	Stones	
										20.42	22.25	Gravel	Clay		
										22.25	23.16	Clay	Stones		
										23.16	24.38	Gravel	Clay		
										24.38	25.91	Clay			
										25.91	26.52	Gravel	Medium Sand	Clay	
										26.52	27.43	Medium Sand	Clay		Red
										27.43	28.65	Clay			Red
										28.65	38.10	Shale			Red
2801094	12/02/60	592672.5	4825371	205.02	26.5	Bedrock	2.74			0.00	12.19	Clay	Gravel	Stones	
										12.19	18.29	Gravel	Clay		
										18.29	18.90	Medium Sand			Red
										18.90	26.52	Shale			Red
2801095	11/14/60	592313.5	4825512	208.86	12.8	Bedrock	7.92			0.00	4.57	Clay	Medium Sand	Boulders	Brown
										4.57	12.50	Clay	Medium Sand	Boulders	Blue
										12.50	12.80	Shale			
2801096	09/24/64	592662.5	4825398	204.65	16.2	Overburden	6.10			0.00	3.66	Topsoil	Clay		Brown
										3.66	15.54	Clay			Grey
										15.54	16.15	Gravel			
2801184	12/17/52	594123.6	4825352	207.89	21	Overburden	3.66			0.00	21.03	Clay	Medium Sand		
2801185	09/30/58	593586.5	4824667	199.05	21.3	Overburden	0.61			0.00	0.30	Topsoil			

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										0.30	6.10	Clay			Yellow
										6.10	7.32	Stones			
										7.32	13.41	Clay			Blue
										13.41	20.73	Silt			
										20.73	21.34	Coarse Sand	Gravel		
2801186	09/03/58	593641.5	4824735	197.87	18.3	Overburden				0.00	0.30	Topsoil			
										0.30	6.10	Clay			Yellow
										6.10	13.41	Clay			Blue
										13.41	18.29	Coarse Sand	Gravel		
2801187	11/01/58	593616.5	4824700	198.24	19.8	Overburden	4.57			0.00	9.14	Previously Dug			
										9.14	14.94	Clay			Blue
										14.94	19.20	Silt			
										19.20	19.81	Coarse Sand	Gravel		
2801188	12/28/58	593541.5	4824617	199.33	18.3	Overburden	4.57			0.00	0.30	Topsoil			
										0.30	6.10	Clay			Yellow
										6.10	7.32	Stones			
										7.32	13.41	Clay			Blue
										13.41	16.46	Silt			
										16.46	18.29	Gravel			
2801189	07/28/59	593277.5	4824881	201.56	19.8	Overburden	1.52			0.00	6.10	Previously Dug			
										6.10	14.63	Clay	Stones		Grey
										14.63	17.07	Clay	Stones		Red
										17.07	17.37	Gravel	Silt	Clay	
										17.37	19.20	Clay			
										19.20	19.81	Gravel			
2801190	04/02/62	593681.5	4824780	195.62	9.1	Overburden	3.05			0.00	3.05	Topsoil	Clay		Brown
										3.05	8.53	Clay			Red
										8.53	9.14	Coarse Sand			
2801191	08/12/63	593244.5	4824979	202.39	18.3	Overburden	3.05			0.00	4.57	Topsoil	Clay		Brown
										4.57	17.68	Clay			Grey
										17.68	18.29	Coarse Sand			
2801192	03/22/67	593332.5	4824827	201.08	20.1	Overburden	0.61			0.00	0.91	Clay			Brown
										0.91	3.66	Clay			Yellow
										3.66	12.80	Clay			Grey
										12.80	15.85	Clay	Gravel		Grey
										15.85	19.20	Fine Sand			Red
										19.20	20.12	Clay	Gravel		Grey
2801193	09/08/67	593304.5	4824859	201.38	23.2	Bedrock	1.22			0.00	11.28	Prev. Drilled			

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										11.28	21.64	Clay			Grey
										21.64	22.25	Gravel			
										22.25	22.86	Clay	Gravel		Grey
										22.86	23.16	Shale			Red
2801194	02/02/63	593823.5	4826116	210.72	12.2	Overburden	7.62			0.00	0.61	Topsoil			
										0.61	12.19	Clay			
2801195	05/17/66	593014.5	4825483	203.55	57.9	Bedrock	0.91	23.16	27.74	0.00	3.05	Clay	Sand	Stones	Brown
										3.05	7.92	Clay	Sand	Stones	Grey
										7.92	12.19	Medium Sand			Brown
										12.19	15.24	Clay	Sand	Stones	Grey
										15.24	18.90	Gravel			
										18.90	20.73	Fine Sand			Brown
										20.73	57.91	Shale			Red
2801196	06/30/67	592717.5	4826021	205.13	21.6	Overburden	0.61			0.00	4.57	Clay			Yellow
										4.57	20.12	Clay			Grey
										20.12	21.03	Gravel			
										21.03	21.64	Clay	Gravel		Red
2801197	05/25/59	592776.5	4825682	205.34	15.2	Overburden	7.62			0.00	4.57	Topsoil	Clay		Brown
										4.57	14.63	Clay	Stones		Grey
										14.63	15.24	Medium Sand			Grey
2801198	10/26/59	592723.5	4825865	204.75	13.4	Overburden	3.05			0.00	4.57	Clay			Brown
										4.57	13.41	Clay			Blue
2801199	07/30/57	592835.5	4827063	215.08	21.6	Overburden	0.30			0.00	4.57	Clay	Stones		
										4.57	13.72	Clay			
										13.72	21.34	Medium Sand			
										21.34	21.64	Gravel			
2801201	09/05/58	592266.5	4825891	214.47	24.4	Bedrock	10.67			0.00	10.06	Clay			
										10.06	24.38	Shale			Red
2801325	06/20/58	594320.5	4826086	206.65	19.8	Bedrock	5.49					Previously			
										0.00	7.92	Dug			
										7.92	14.63	Clay	Gravel		
										14.63	19.81	Shale			Red
2801326	12/16/60	594057.5	4826122	208.97	15.5	Bedrock	3.05			0.00	1.83	Clay			
										1.83	4.57	Fine Sand			
										4.57	9.14	Fine Sand	Gravel		
2801327	12/17/60	594082.5	4826077	209.97	18.9	Bedrock	3.35			9.14	15.54	Shale			Red
										0.00	1.83	Clay			
										1.83	4.88	Fine Sand			
										4.88	10.97	Medium Sand	Gravel		
										10.97	18.90	Shale			Red

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
2801328	07/22/61	594082.5	4826064	210.06	11	Bedrock	7.62			0.00 3.66 9.14 10.67	3.66 9.14 10.67 10.97	Topsoil Clay Gravel Shale	Clay Medium Sand Medium Sand		Brown Red Red
2801329	08/24/65	594150.5	4826005	210.53	10.1	Overburden	4.57			0.00 9.45	9.45 10.06	Topsoil Medium Sand	Clay Gravel		Brown
2801331	04/26/66	594089.5	4826059	210.10	7.6	Overburden	3.05			0.00 3.66 6.71	3.66 6.71 7.62	Topsoil Clay Gravel	Clay		Grey Red
2801332	09/13/67	594009.5	4826142	209.10	7.6	Overburden	1.83			0.00 3.05 7.32	3.05 7.32 7.62	Topsoil Clay Medium Sand	Clay		Brown Grey
2801333	05/11/63	593583.5	4826582	214.59	6.7	Bedrock	4.88			0.00 6.10	6.10 6.71	Clay Shale			
2801335	11/01/60	593235.5	4826901	214.47	14.9	Bedrock	1.83			0.00 0.91 12.80 14.63	0.91 12.80 14.63 14.94	Clay Hardpan Shale Gravel			Brown Red Red
2801336	11/02/60	593265.5	4826874	214.82	11.3	Overburden	1.52			0.00 1.52 10.67	1.52 10.67 11.28	Clay Hardpan Gravel			Brown Red
2801337	11/03/60	593288.5	4826849	214.90	12.2	Overburden	1.22			0.00 1.52 10.97 11.89	1.52 10.97 11.89 12.19	Clay Hardpan Fine Sand Gravel			Brown Red
2801338	11/05/60	593313.5	4826824	214.97	9.8	Overburden	1.52			0.00 2.13 7.62 9.14	2.13 7.62 9.14 9.75	Clay Hardpan Medium Sand Gravel			 Red
2801339	01/31/61	593290.5	4826846	214.90	25.9	Bedrock	6.10			0.00 2.13 9.14 20.73	2.13 9.14 20.73 25.91	Clay Clay Clay Shale	 Medium Sand		Brown Blue Red Red
2801340	05/08/61	593240.5	4826906	214.43	28.3	Bedrock	0.91			0.00 14.02 16.15 19.81	14.02 16.15 19.81 28.35	Prev. Drilled Quicksand Gravel Shale	 Medium Sand	 Clay	 Grey Red
2801342	01/04/67	593540.5	4826632	214.83	8.8	Bedrock	2.44			0.00 0.61	0.61 2.44	Topsoil Clay			 Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										2.44	7.01	Clay	Medium Sand		
										7.01	8.84	Shale			Red
2802611	05/11/57	593638.5	4823759	195.86	27.4	Bedrock				0.00	3.66	Clay			
										3.66	11.58	Clay	Gravel		
										11.58	19.81	Quicksand	Silt		
										19.81	21.34	Gravel	Clay		
										21.34	27.43	Shale			Red
2802612	06/11/58	593890.5	4823471	195.25	12.8	Overburden	5.49			0.00	3.66	Clay			Brown
										3.66	9.14	Clay	Stones		Grey
										9.14	12.19	Clay	Stones		Red
										12.19	12.80	Medium Sand			Red
2802639	06/01/61	593339.5	4824340	195.14	15.2	Overburden	1.52			0.00	3.66	Topsoil	Clay		Brown
										3.66	14.63	Clay			Red
										14.63	15.24	Medium Sand			
2802663	09/16/61	594552.6	4825838	203.06	30.5	Bedrock	7.32			0.00	0.61	Topsoil			
										0.61	23.77	Clay			Blue
										23.77	30.48	Shale			Red
2802664	03/11/67	594143.6	4825294	208.41	18.6	Overburden	9.14			0.00	5.49	Topsoil	Clay		Brown
										5.49	18.29	Clay			Grey
										18.29	18.59	Medium Sand	Gravel		Red
2802699	07/10/65	595256.6	4826090	209.45	10.4	Overburden	4.57			0.00	3.66	Topsoil	Clay		Brown
										3.66	10.06	Clay			Grey
										10.06	10.36	Gravel			
2802924	07/20/68	591964.5	4824173	206.49	12.2	Overburden	9.14			0.00	1.83	Topsoil			
										1.83	12.19	Clay			White
2802956	08/17/68	594004.5	4826053	209.93	17.7	Bedrock	1.22			0.00	15.24	Gravel			
										15.24	17.68	Shale			Red
2803075	04/23/69	593914.5	4825223	205.40	9.8	Overburden	0.91			0.00	0.61	Topsoil			
										0.61	5.79	Clay			Brown
										5.79	9.75	Clay			Grey
2803188	09/04/69	594074.6	4825143	207.34	11	Overburden	3.66			0.00	3.05	Clay	Medium Sand		Brown
										3.05	10.36	Clay			Grey
										10.36	10.97	Medium Sand			Grey
2803204	03/21/69	593954.5	4826123	209.95	19.2	Bedrock	2.44			0.00	10.97	Clay	Stones		
										10.97	16.46	Medium Sand	Clay		
										16.46	19.20	Shale			Red
2803217	09/20/69	593494.5	4826673	214.98	7.3	Bedrock	2.13			0.00	0.30	Topsoil			Black
										0.30	3.35	Clay	Medium Sand		Brown
										3.35	3.96	Clay	Stones		Grey

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										3.96	5.79	Gravel	Medium Sand		Brown
										5.79	7.32	Shale			Red
2803527	12/12/70	592964.5	4823883	194.99	17.4	Overburden				0.00	0.61	Topsoil			Black
										0.61	1.22	Clay			Brown
										1.22	4.88	Clay	Boulders		Blue
										4.88	9.75	Clay	Stones		Grey
										9.75	12.50	Clay			Blue
										12.50	14.02	Clay			Brown
										14.02	17.07	Clay			Blue
										17.07	17.37	Fine Sand			Brown
2803864	07/14/72	593274.5	4824863	201.41	20.1	Overburden	17.07			0.00	0.61	Topsoil			
										0.61	5.49	Clay			Brown
										5.49	8.53	Clay			Blue
										8.53	17.37	Clay	Stones		Brown
										17.37	18.90	Silt			Red
										18.90	20.12	Gravel			
2804036	10/10/72	593994.5	4826003	210.36	18.6	Bedrock	3.35			0.00	0.91	Topsoil			
										0.91	7.62	Clay			Brown
										7.62	14.02	Clay			Blue
										14.02	18.59	Shale			Red
2804064	10/08/72	592714.5	4823663	199.05	13.1	Overburden	2.13			0.00	0.30	Topsoil			Black
										0.30	3.35	Clay			Brown
										3.35	5.18	Clay			Blue
										5.18	5.49	Sand	Silt		Grey
										5.49	12.19	Clay	Sand		Grey
										12.19	12.80	Clay			Grey
										12.80	13.11	Sand			Black
2804072	03/24/72	591464.5	4824623	211.21	12.2	Overburden	2.44			0.00	0.30	Topsoil			Brown
										0.30	5.49	Clay	Stones		Brown
										5.49	8.53	Clay			Grey
										8.53	12.19	Fine Sand	Silt		Brown
2804076	01/06/73	593509.5	4824563	198.20	24.4	Overburden	2.44			0.00	5.49	Clay			Brown
										5.49	6.71	Boulders			
										6.71	8.84	Clay			Blue
										8.84	11.28	Clay			Brown
										11.28	11.58	Boulders			
										11.58	15.24	Clay	Clay		Brown
										15.24	21.34	Silt			
										21.34	24.38	Gravel			
2804120	12/30/72	593485.5	4824345	196.89	11.3	Overburden				0.00	0.30	Topsoil			Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										0.30	2.74	Clay			Brown
										2.74	7.32	Clay			Grey
										7.32	8.84	Sand			Grey
										8.84	10.36	Sand	Muck		Brown
										10.36	10.97	Sand	Gravel	Stones	Brown
										10.97	11.28	Clay			Brown
2804130	07/14/72	592014.5	4824273	210.51	14.6	Overburden	3.66			0.00	0.30	Topsoil			Brown
										0.30	5.49	Clay			Brown
										5.49	14.63	Clay			Grey
2804159	01/17/73	593077.5	4825393	203.42	10.7	Overburden	1.22			0.00	3.66	Sand			Brown
										3.66	10.06	Clay			Grey
										10.06	10.67	Coarse Sand			
2804372	10/04/73	591254.5	4824853	216.15	12.2	Bedrock	4.57			0.00	0.30	Topsoil			Brown
										0.30	4.27	Clay			Brown
										4.27	7.92	Clay	Stones	Sand	Grey
										7.92	9.14	Sand	Clay		Red
										9.14	12.19	Shale			Red
2804395	04/27/73	593724.5	4824763	196.61	18.3	Overburden				0.00	17.98	Sand	Gravel		
										17.98	18.29	Gravel			
2804456	08/11/73	591234.5	4824647	218.81	12.8	Bedrock	5.49			0.00	0.30	Topsoil			Brown
										0.30	3.96	Clay	Stones		Brown
										3.96	8.53	Stones	Sand		Grey
										8.53	10.36	Sand			Brown
										10.36	12.80	Shale			Red
2804498	04/06/74	593710.5	4825742	205.12	24.4	Bedrock	1.52			0.00	0.30	Topsoil			Brown
										0.30	5.49	Clay	Boulders		Brown
										5.49	11.89	Clay			Grey
										11.89	24.38	Shale	Rock		Red
2804499	04/06/74	593688.5	4825765	204.63	25.9	Bedrock	1.52			0.00	0.30	Topsoil			Brown
										0.30	5.49	Clay	Boulders		Brown
										5.49	11.28	Clay			Grey
										11.28	25.91	Shale	Rock		Red
2804500	04/06/74	593670.5	4825752	204.67	22.9	Bedrock	1.52			0.00	0.30	Topsoil			Brown
										0.30	5.49	Clay	Boulders		Brown
										5.49	11.58	Clay			Grey
										11.58	22.86	Shale	Rock		Red
2804510	07/08/74	593097.5	4826953	212.38	8.8	Overburden	1.22			0.00	0.30	Topsoil			
										0.30	8.84	Boulders	Clay	Sand	
2804609	09/20/74	593675.5	4824707	196.06	29.6	Overburden	0.91			0.00	4.88	Clay			Brown
										4.88	16.46	Clay			Grey

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										16.46	17.68	Sand	Silt		Brown
										17.68	22.56	Sand	Gravel	Silt	Brown
										22.56	26.82	Sand			Grey
										26.82	29.57	Clay	Gravel		Grey
2804688	09/12/74	593801.5	4824870	200.97	16.2	Bedrock	1.83			0.00	0.30	Topsoil			Brown
										0.30	0.91	Clay			Brown
										0.91	4.27	Clay			Grey
										4.27	14.02	Rock			Grey
										14.02	14.63	Clay			Red
										14.63	14.94	Clay	Stones		Grey
										14.94	15.85	Coarse Sand	Gravel		Black
										15.85	16.15	Clay			Grey
2804939	10/04/76	593764.5	4825023	200.76	22.3	Bedrock				0.00	9.75	Prev. Drilled			
										9.75	11.58	Clay			Grey
										11.58	15.54	Clay	Hardpan		Grey
										15.54	18.59	Quicksand			Grey
										18.59	21.34	Clay			Blue
										21.34	21.64	Clay	Gravel		Blue
										21.64	22.25	Clay	Gravel		Red
										22.25	22.25	Shale			Red
2804955	09/26/73	592446.5	4823313	199.81	21.9	Bedrock	3.96			0.00	0.30	Topsoil			Black
										0.30	13.11	Sand	Clay		Brown
										13.11	20.42	Sand			Brown
										20.42	21.95	Shale			Red
										0.00	3.05	Topsoil	Sandy		Brown
2805027	03/03/77	593364.5	4824723	200.10	18.9	Overburden	4.57			3.05	18.29	Clay			Grey
										18.29	18.90	Coarse Sand	Water-bearing		
2805198	03/15/77	593614.5	4826563	214.34	24.4	Bedrock	2.13			0.00	6.71	Previously Dug			
										6.71	24.38	Shale			Red
2805202	09/22/77	592334.5	4823963	198.74	31.4	Overburden				0.00	0.61	Topsoil			Black
										0.61	22.56	Clay	Muck		Grey
										22.56	29.87	Fine Sand			Grey
										29.87	31.39	Coarse Sand	Gravel		Grey
2805380	07/20/79	592814.5	4823183	198.17	36.6	Bedrock	2.44			0.00	5.49	Clay			Brown
										5.49	9.75	Clay	Gravel	Stones	Grey
										9.75	11.58	Clay	Gravel	Stones	Brown
										11.58	14.02	Gravel	Stones		Grey
										14.02	18.29	Clay	Stones		Red
										18.29	36.58	Shale	Hard		Red

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
2805394	08/24/79	593374.5	4824863	201.42	21.9	Bedrock	1.22			0.00	3.35	Clay			Brown
										3.35	7.01	Clay			Grey
										7.01	14.02	Clay	Gravel	Sand	Red
										14.02	15.54	Sand			Grey
										15.54	19.51	Clay			Brown
										19.51	21.95	Clay	Gravel		Red
										21.95	21.95	Shale			Red
2805396	07/01/79	592774.5	4823363	197.72	15.2	Bedrock				0.00	0.30	Topsoil			
										0.30	3.05	Clay	Gravel	Stones	Brown
										3.05	5.49	Clay	Gravel	Stones	Grey
										5.49	6.10	Clay	Stones	Shale	Brown
										6.10	7.62	Shale	Medium-grained	Hard	Grey
										7.62	13.41	Clay	Gravel	Shale	Grey
										13.41	15.24	Shale	Layered		Grey
2805440	10/21/78	593094.5	4825003	202.27	12.2	Overburden	3.05			0.00	0.30	Topsoil			Brown
										0.30	4.27	Clay			Brown
										4.27	8.53	Clay	Stones	Packed	Grey
										8.53	11.58	Sand	Clay	Layered	Brown
										11.58	12.19	Fine Sand	Medium Sand	Silt	Brown
2805536	01/10/80	593974.5	4825183	205.88	14.3	Overburden	2.13			0.00	0.30	Topsoil			Brown
										0.30	14.33	Clay	Stones	Boulders	Brown
										14.33	14.33	Clay	Sand	Stones	Grey
2805559	02/12/79	592814.5	4825073	200.14	33.5	Overburden	8.84			0.00	6.10	Clay	Sand	Stones	Brown
										6.10	13.11	Clay	Sand	Gravel	Brown
										13.11	15.24	Stones	Dark-coloured		Brown
										15.24	25.91	Stones			Grey
										25.91	33.53	Stones	Light-coloured		Grey
2805630	03/19/80	593174.5	4826863	214.08	13.7	Bedrock	3.05			0.00	0.30	Topsoil			Brown
										0.30	4.57	Clay	Stones		Brown
										4.57	11.89	Clay	Stones	Sand	Grey
										11.89	13.72	Shale	Hard		Red
2805675	09/22/80	592914.5	4825323	204.76	12.8	Overburden	2.44			0.00	8.53	Clay	Stones		Brown
										8.53	10.06	Silt	Layered		Grey
										10.06	10.97	Silt	Clay		Red
										10.97	12.19	Fine Sand	Silt		Brown
										12.19	12.80	Clay	Hard		Brown
2805678	09/23/80	592954.5	4825303	204.31	14	Overburden	2.44			0.00	7.92	Clay	Stones		Brown
										7.92	9.45	Clay	Packed	Layered	Grey
										9.45	10.97	Silt	Sand		Red

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										10.97	13.41	Muck	Sand		Grey
										13.41	14.02	Sand	Loose		Black
2805773	05/16/81	592714.5	4825423	206.48	16.2	Overburden	3.05			0.00	0.30	Topsoil			Brown
										0.30	4.57	Clay			Brown
										4.57	6.71	Clay			Blue
										6.71	10.67	Clay	Stones	Hard	Brown
										10.67	16.15	Sand	Clay	Loose	Brown
2805829	12/16/81	592854.5	4825943	206.01	36.6	Bedrock	2.74			0.00	24.99	Clay	Stones	Packed	Brown
										24.99	36.58	Shale	Limestone	Soft	Red
2806240	01/03/85	593211.9	4823315	195.89	12.2	Overburden	3.05			0.00	0.30	Topsoil	Hard		Brown
										0.30	6.10	Clay			Brown
										6.10	12.19	Clay	Stones		Grey
2806302	05/26/85	593520.9	4824682	200.22	7.6	Overburden	4.57			0.00	0.30	Topsoil			Brown
										0.30	4.88	Sand	Clay		Brown
										4.88	7.62	Clay	Silt	Layered	Blue
2806357	06/05/85	593105.9	4825463	201.84	10.4	Overburden	1.22			0.00	0.30	Topsoil			Brown
										0.30	3.35	Clay	Packed		Brown
										3.35	5.49	Clay	Silt	Stones	Grey
										5.49	7.32	Clay	Silt	Layered	Brown
										7.32	7.92	Silt	Clay		Red
										7.92	10.36	Coarse Sand	Medium Sand	Stones	Black
2806758	05/05/87	593211.9	4824984	202.39	13.1	Overburden	2.44			0.00	0.30	Topsoil			Brown
										0.30	10.97	Clay	Stones	Hard	Grey
										10.97	13.11	Clay	Silty	Soft	Grey
										13.11	13.11	Silt	Fine Sand		Grey
2806792	03/04/86	594225	4825352	207.81	13.4	Overburden	3.05			0.00	0.30	Topsoil			Black
										0.30	1.22	Clay	Stones		Brown
										1.22	4.27	Clay	Sand	Stones	Red
										4.27	5.18	Clay	Packed		Brown
										5.18	12.19	Sand	Clay	Stones	Grey
										12.19	13.41	Medium Sand			Grey
2806793	07/26/85	594209	4825233	208.45	21	Overburden	6.10			0.00	0.30	Topsoil			Brown
										0.30	1.52	Clay	Packed		Brown
										1.52	2.74	Stones	Clay	Packed	Brown
										2.74	3.05	Sand	Muck		Brown
										3.05	6.10	Clay	Stones		Brown
										6.10	12.19	Clay	Stones		Blue
										12.19	14.94	Muck	Sand	Silt	Grey
										14.94	18.29	Clay	Stones		Grey
										18.29	21.03	Clay	Sand	Silt	Blue

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
2806830	01/04/88	593610	4825584	206.30	13.7	Bedrock	-0.30	10.97	11.89	0.00	1.22	Clay			Brown
										1.22	5.49	Clay	Sandy	Gravel	Brown
										5.49	7.92	Clay	Sandy	Gravel	Grey
										7.92	11.58	Clay	Gravel	Stones	Red
										11.58	13.72	Shale			Red
2806870	04/15/88	593262.9	4824824	201.13	11.6	Overburden	2.74			0.00	0.30	Topsoil	Soft		Brown
										0.30	5.49	Clay	Stones	Fine Sand	Brown
										5.49	9.45	Clay	Stones	Boulders	Grey
										9.45	10.97	Clay	Sand	Stones	Red
										10.97	11.58	Clay	Stones	Hard	Brown
2806871	04/19/88	593291.9	4824790	200.76	17.4	Overburden	3.35			0.00	0.30	Topsoil	Soft		Brown
										0.30	4.27	Clay	Stones	Fine Sand	Brown
										4.27	7.32	Clay	Stones	Fine Sand	Grey
										7.32	10.67	Clay	Sand	Soft	Red
										10.67	14.33	Clay	Silt	Sandstone	Grey
										14.33	15.24	Clay	Silt	Soft	Grey
										15.24	16.15	Sand	Soft		Grey
										16.15	17.37	Clay	Silt	Fine Sand	Red
2806872	04/21/88	593319.9	4824755	200.33	17.4	Overburden	1.83			0.00	0.30	Topsoil	Soft		Brown
										0.30	10.67	Clay	Stones	Fine Sand	Brown
										10.67	14.33	Clay	Stones	Fine Sand	Grey
										14.33	15.54	Clay	Stones	Fine Sand	Red
										15.54	17.37	Sand	Soft		Grey
2806873	04/22/88	593352.9	4824724	200.06	17.1	Overburden	2.13			0.00	0.30	Topsoil	Soft		Brown
										0.30	3.05	Clay	Stones	Fine Sand	Brown
										3.05	7.92	Clay	Stones	Hard	Grey
										7.92	11.28	Clay	Stones	Hard	Red
										11.28	13.11	Clay	Sand	Stones	Grey
										13.11	15.54	Clay	Sand		Grey
										15.54	17.07	Sand	Soft		Grey
2806904	05/09/88	591568.9	4824557	209.61	4.6	Overburden	1.52			0.00	0.30	Topsoil	Loose		Brown
										0.30	3.96	Clay	Fine Sand		Brown
										3.96	4.57	Sand	Silt	Soft	Red
2807006	07/22/88	594100	4825199	207.69	57	Bedrock				0.00	5.49	Clay	Gravelly		Brown
										5.49	29.26	Clay	Sandy		Grey
										29.26	57.00	Shale			Red
2807055	08/17/88	594180	4825157	208.86	12.5	Overburden	4.27			0.00	0.30	Topsoil			Brown
										0.30	1.52	Clay			Brown
										1.52	4.88	Sand	Clay	Stones	Brown
										4.88	5.79	Medium Sand	Fine Sand	Coarse Sand	Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										5.79	12.50	Clay	Silt	Sand	Brown
2807106	10/20/88	592901.5	4824249	197.05	10.7	Overburden	0.61			0.00	0.61	Topsoil	Soft		Brown
										0.61	2.44	Clay	Fine Sand		Brown
										2.44	3.66	Clay	Fine Sand		Red
										3.66	5.18	Clay	Fine Sand		Grey
										5.18	5.49	Sand	Gravel	Loose	Brown
										5.49	10.06	Clay	Fine Sand		Grey
										10.06	10.67	Sand	Loose		Grey
2807176	12/02/88	594062	4825438	206.40	18.3	Bedrock	0.61	6.10	12.19	0.00	5.18	Clay	Stones	Medium-grained	Brown
										5.18	6.10	Sand	Medium Gravel		Brown
										6.10	7.92	Gravel	Coarse Hard		Brown
										7.92	15.54	Clay	Gravel	Hard	Grey
										15.54	18.29	Shale	Rock	Hard	Red
2807267	05/09/89	594186.5	4826909	214.78	24.1	Bedrock	12.19			0.00	1.52	Topsoil			Black
										1.52	3.05	Sand	Gravel		Yellow
										3.05	6.10	Unknown Type			
										6.10	7.62	Unknown Type			
										7.62	9.14	Unknown Type			
										9.14	12.19	Unknown Type			
										12.19	13.11	Unknown Type			
										13.11	13.72	Unknown Type			
										13.72	14.63	Unknown Type			
										14.63	17.07	Unknown Type			
										17.07	18.29	Shale			Red
										18.29	24.08	Shale			Red
2807314	07/19/89	594156	4826002	210.53	8.2	Overburden	5.18			0.00	0.30	Topsoil	Loose		Brown
										0.30	3.96	Clay	Stones		Brown
										3.96	5.79	Clay	Stones		Grey
										5.79	7.62	Fine Sand	Loose		Grey
										7.62	8.23	Clay	Stones	Boulders	Grey
2807315	07/10/89	593960	4826197	209.63	7.6	Overburden	1.52			0.00	0.30	Topsoil	Loose		Brown
										0.30	2.44	Clay	Stones	Fine Sand	Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										2.44	6.10	Sand	Clay	Stones	Brown
										6.10	7.62	Sand	Gravel	Loose	Brown
2807341	07/14/89	591621.5	4825552	219.09	22.9	Overburden	0.30	21.95	22.86	0.00	3.96	Clay	Sandy	Loose	Brown
										3.96	5.18	Clay	Gravel	Loose	Brown
										5.18	7.32	Clay	Sandy	Loose	Grey
										7.32	8.23	Clay	Sandy	Loose	Brown
										8.23	10.67	Clay	Sandy	Loose	Grey
										10.67	15.24	Clay	Sandy	Loose	Brown
										15.24	17.98	Sand	Loose		Brown
										17.98	18.59	Sand	Gravel	Loose	Brown
										18.59	21.95	Clay	Gravel	Loose	Grey
										21.95	22.56	Fine Sand	Coarse Gravel	Loose	Grey
										22.56	22.86	Clay	Gravel	Loose	Grey
2807342	07/22/89	593350.9	4824838	201.20	17.7	Overburden	3.66			0.00	2.74	Clay	Loose		Brown
										2.74	5.49	Clay	Sandy	Loose	Brown
										5.49	7.01	Clay	Silty	Loose	Grey
										7.01	9.14	Clay	Sandy	Loose	Grey
										9.14	11.28	Sand	Gravel	Loose	Brown
										11.28	12.80	Clay	Gravel	Loose	Grey
										12.80	16.76	Clay	Silty	Loose	Grey
										16.76	17.68	Clay	Silty	Loose	Brown
2807363	07/21/89	594159	4825304	208.34	10.7	Overburden	3.05			0.00	0.30	Topsoil	Loose		Brown
										0.30	1.83	Clay	Fine Sand		Brown
										1.83	8.84	Clay	Stones	Fine Sand	Brown
										8.84	9.14	Stones	Hard		
										9.14	10.06	Sand	Silty	Loose	Brown
										10.06	10.67	Medium Sand	Fine Sand	Loose	Grey
2807385	08/27/89	592093.9	4824165	204.84	10.1	Overburden	0.91			0.00	0.30	Topsoil	Soft		Brown
										0.30	4.27	Clay	Stones	Fine Sand	Brown
										4.27	9.14	Clay	Stones	Fine Sand	Grey
										9.14	10.06	Sand	Loose		Grey
2807386	08/28/89	592145.9	4824112	202.79	11.6	Overburden	-0.30			0.00	0.30	Topsoil	Loose		Brown
										0.30	4.27	Clay	Stones	Fine Sand	Brown
										4.27	10.67	Clay	Stones	Fine Sand	Grey
										10.67	11.58	Sand	Loose		Grey
2807406	12/29/86	594111	4825203	207.83	15.8	Overburden	3.96			0.00	0.30	Topsoil			Brown
										0.30	1.52	Clay			Brown
										1.52	5.49	Sand	Clay	Packed	Brown
										5.49	6.71	Medium Sand	Fine Sand	Coarse Sand	Brown
										6.71	13.11	Clay	Silt	Layered	Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										13.11	15.85	Medium Sand	Stones	Clay	Brown
2807444	04/11/89	593548.5	4826495	213.58	14	Overburden	5.18			0.00	0.30	Topsoil			Black
										0.30	3.66	Clay			Brown
										3.66	10.67	Sand	Gravel		Red
										10.67	13.72	Gravel	Coarse Gravel	Dry	Brown
										13.72	14.02	Gravel	Medium Gravel		Brown
2807481	11/01/89	593350.9	4824838	201.20	27.4	Bedrock	3.66	20.42	21.34	0.00	17.68	Prev. Drilled			
										17.68	19.81	Clay	Silty	Loose	Grey
										19.81	22.56	Gravel	Sand	Loose	Grey
										22.56	24.08	Clay	Silty	Loose	Red
										24.08	27.43	Shale	Hard		Red
2807503	11/10/89	594429	4825474	207.46	21.9	Bedrock	6.10	19.20	20.12	0.00	4.57	Clay	Sand		Brown
										4.57	10.97	Clay	Sand	Gravel	Brown
										10.97	15.24	Clay	Sand		Brown
										15.24	18.90	Clay	Sand	Gravel	Brown
										18.90	20.42	Coarse Sand			Brown
										20.42	21.64	Sand	Clay	Gravel	Brown
										21.64	21.95	Shale			Red
2807504	11/10/89	594260	4825370	207.50	29	Bedrock				0.00	3.96	Clay	Sand		Brown
										3.96	5.18	Clay	Sand	Fine Gravel	Brown
										5.18	6.71	Clay	Sand	Coarse Gravel	Brown
										6.71	7.62	Clay	Gravel		Grey
										7.62	8.84	Sand	Fine Gravel		Brown
										8.84	9.75	Fine Sand			Grey
										9.75	10.67	Clay	Fine Gravel		Grey
										10.67	14.33	Clay	Sand		Grey
										14.33	15.24	Sand			Grey
										15.24	24.69	Sand	Gravel		Grey
										24.69	26.21	Clay	Sand		Red
										26.21	28.96	Shale			Red
2807529	11/22/89	593461.9	4823760	194.99	15.5	Overburden	5.18			0.00	0.30	Topsoil	Fine Sand		Brown
										0.30	3.66	Clay	Stones	Fine Sand	Brown
										3.66	7.32	Clay	Stones	Fine Sand	Grey
										7.32	8.84	Clay	Fine Sand		Grey
										8.84	9.45	Clay	Stones	Hard	Red
										9.45	12.19	Clay	Fine Sand		Grey
										12.19	13.11	Sand	Loose		Grey
										13.11	15.54	Clay	Stones	Hard	Red
2807598	06/12/90	593984	4825434	205.58	14.6	Bedrock	1.52			0.00	0.61	Topsoil	Loose		Brown

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										0.61	1.22	Clay	Stones	Fine Sand	Brown
										1.22	3.66	Clay	Stones	Fine Sand	Red
										3.66	5.79	Clay	Boulders	Hard	Grey
										5.79	6.40	Clay	Shale	Hard	Red
										6.40	14.63	Shale	Limestone	Hard	Red
2807648	08/18/90	593564	4825393	202.69	14.6	Bedrock	4.57			0.00	0.30	Topsoil	Fine Sand		Brown
										0.30	4.27	Clay	Stones	Fine Sand	Brown
										4.27	9.45	Clay	Stones	Fine Sand	Grey
										9.45	14.63	Shale	Limestone	Hard	Red
2807779	03/25/91	591997.9	4824124	204.97	8.5	Overburden	1.83			0.00	0.30	Topsoil	Fine Sand		Brown
										0.30	2.74	Clay	Hard		Brown
										2.74	5.18	Fine Sand	Clay	Stones	Brown
										5.18	5.79	Clay	Hard		Grey
										5.79	7.01	Fine Sand	Loose		Red
										7.01	7.92	Clay	Fine Sand		Grey
										7.92	8.53	Coarse Sand	Gravel		Brown
2807799	06/07/90	594045	4825284	207.55	21.6	Overburden	5.49			0.00	4.27	Clay	Stones		Brown
										4.27	6.71	Sand			Grey
										6.71	10.97	Sand	Clay		Grey
										10.97	14.33	Silt			Grey
										14.33	20.73	Clay			Grey
										20.73	21.64	Sand	Gravel		Grey
2807963	02/20/92	593613.9	4824741	198.79	15.2	Overburden	1.83			0.00	7.01	Clay	Stones	Hard	Brown
										7.01	8.53	Clay	Stones	Hard	Grey
										8.53	10.67	Clay	Boulders	Hard	Brown
										10.67	15.24	Sand	Stones	Silt	Grey
2807994	01/31/92	593272.9	4824906	201.81	24.1	Bedrock	2.74			0.00	0.30	Topsoil			Black
										0.30	7.92	Clay			Brown
										7.92	16.46	Clay			Red
										16.46	22.25	Sand	Gravel	Stones	Red
										22.25	24.08	Shale			Red
2808012	08/10/92	592291.9	4824030	200.15	12.5	Overburden	1.22			0.00	0.30	Topsoil	Soft		Brown
										0.30	1.22	Fill	Fine Sand	Wood Fragments	Brown
										1.22	9.75	Clay	Stones	Hard	Brown
										9.75	10.36	Sand	Clay	Silt	Brown
										10.36	12.50	Silt	Soft		Brown
2808054	09/14/92	591307.9	4824772	216.20	14.6	Bedrock	3.35			0.00	0.30	Topsoil	Soft		Brown
										0.30	6.10	Clay	Stones	Fine Sand	Brown
										6.10	13.72	Clay	Silt	Hard	Grey

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										13.72	14.63	Shale	Limestone	Hard	Red
2808199	11/03/93	594535	4825202	205.39	12.2	Overburden	8.84	9.14	12.19	0.00	3.96	Silt	Clay	Dense	Brown
										3.96	10.67	Sand	Silt	Dense	Grey
										10.67	12.19	Silt	Sand	Dense	Grey
2808208	11/13/93	594475	4825380	206.12	18.3	Overburden		15.24	18.29	0.00	1.83	Till	Clay	Dense	Brown
										1.83	9.75	Till	Silt	Dense	Brown
										9.75	11.58	Sand	Silt	Dense	Grey
										11.58	18.29	Sand	Dense		Grey
2808209	11/03/93	594492	4825191	205.70	12.2	Overburden		9.14	12.19	0.00	1.83	Till	Clay	Hard	Brown
										1.83	5.18	Till	Silt	Dense	Brown
										5.18	7.92	Silt	Clay	Dense	Grey
										7.92	12.19	Till	Silt	Dense	Grey
2808210	11/12/93	594473	4825378	206.11	12.2	Overburden		9.14	12.19	0.00	1.83	Till	Clay	Hard	Brown
										1.83	9.75	Till	Silt	Dense	Brown
										9.75	12.19	Sand	Silt	Dense	Grey
2808211	11/10/93	594475	4825664	208.05	12.2	Overburden		9.14	12.19	0.00	2.13	Till	Clay	Hard	Brown
										2.13	4.57	Till	Sandy	Dense	Brown
										4.57	7.92	Till	Silt	Dense	Grey
										7.92	12.19	Till	Sand	Dense	Grey
2808212	11/10/93	594281	4825410	207.26	12.2	Overburden		9.14	12.19	0.00	2.13	Till	Silty	Hard	Brown
										2.13	5.18	Till	Silt	Dense	Grey
										5.18	11.58	Till	Silt	Dense	Grey
										11.58	12.19	Till	Clay	Dense	Grey
2808238	04/26/94	591923.9	4824042	201.04	15.5	Overburden	-0.30			0.00	0.91	Topsoil	Soft		Black
										0.91	4.27	Clay	Hard		Brown
										4.27	6.40	Clay	Boulders	Hard	Grey
										6.40	7.32	Sand	Dry		Grey
										7.32	12.80	Clay	Boulders	Hard	Grey
										12.80	15.54	Fine Sand	Stones	Soft	Brown
2808253	08/20/93	594624	4825868	205.41	29	Bedrock	4.57			0.00	0.30	Topsoil			Black
										0.30	3.96	Clay	Stones		Brown
										3.96	14.94	Clay	Stones	Layered	Grey
										14.94	18.29	Clay			Red
										18.29	28.96	Shale			Red
2808306	10/03/94	593116.5	4826987	213.02	25.9	Bedrock	3.35			0.00	0.61	Topsoil			Brown
										0.61	11.89	Clay	Fine Gravel		Grey
										11.89	17.07	Sand			Grey
										17.07	18.29	Clay	Stones		Blue
										18.29	20.73	Sand	Coarse Gravel		Grey
										20.73	21.95	Shale	Soft		Red

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										21.95	25.91	Shale	Hard		Red
2808334	10/27/94	594141	4825302	208.40	33.5	Bedrock	4.88			0.00	0.61	Topsoil			Black
										0.61	12.80	Clay			Brown
										12.80	17.07	Sand	Gravel		Brown
										17.07	18.29	Clay	Stones		Blue
										18.29	25.91	Sand	Coarse Gravel		
										25.91	28.04	Shale	Soft		Red
										28.04	33.53	Shale	Hard		Red
2808335	11/25/94	594163	4825314	208.28	31.4	Bedrock	4.88			0.00	0.61	Topsoil			Black
										0.61	7.62	Clay	Stones		Brown
										7.62	13.72	Sand			Brown
										13.72	20.73	Clay	Stones		Grey
										20.73	28.04	Sand			Brown
										28.04	31.39	Shale	Hard		Red
2808521	02/25/97	593588	4825590	206.93	24.4	Overburden				0.00	24.38	Unknown Type			
2808522	02/25/97	593610	4825622	206.21	24.4	Overburden				0.00	24.38	Unknown Type			
2808523	02/25/97	593617	4825619	206.08	24.4	Overburden				0.00	24.38	Unknown Type			
2808539	03/23/96	593214.9	4826920	214.15	24.4	Bedrock	0.30			0.00	0.61	Topsoil			Black
										0.61	5.49	Clay			Brown
										5.49	7.32	Clay			Grey
										7.32	10.06	Clay	Gravel		Grey
										10.06	11.58	Clay	Sand	Gravel	Grey
										11.58	17.68	Sand	Silty	Gravel	Grey
										17.68	24.38	Shale			Red
2809064	08/09/99	592053.5	4825113	208.91	49.7	Bedrock	37.19			0.00	0.30	Topsoil			
										0.30	9.14	Clay	Stones		Brown
										9.14	21.34	Clay	Sand		Brown
										21.34	25.91	Sand	Clay		Brown
										25.91	26.52	Sand	Clay	Gravel	Brown
										26.52	27.74	Shale			Grey
										27.74	49.68	Shale			Red
2809074	10/14/99	592901.5	4824249	197.05	17.1	Overburden	2.13			0.00	0.30	Topsoil			Brown
										0.30	3.66	Clay	Sandy		Brown
										3.66	10.67	Clay	Stones		Blue
										10.67	15.24	Clay	Stones		Blue
										15.24	17.07	Sand	Clay	Layered	Grey
2809204	12/13/99	593790.5	4825361	204.88	26.5	Bedrock	1.83			0.00	0.30	Topsoil			Black

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										0.30	4.57	Clay			Grey
										4.57	7.62	Sand			Brown
										7.62	9.14	Sand	Clay		Brown
										9.14	10.97	Sand	Clay		Red
										10.97	14.63	Sand	Clay		Grey
										14.63	22.25	Sand			Red
										22.25	23.47	Gravel			
										23.47	26.52	Shale			Red
2809618	07/18/02	592916.9	4826209	208.12	9.1	Overburden	2.44			0.00	0.30	Topsoil			Brown
										0.30	3.66	Clay	Sandy		Brown
										3.66	8.23	Clay	Silt	Stones	Grey
										8.23	8.84	Sand			Grey
										8.84	9.14	Gravel			Grey
2809946	02/11/04	594020	4824444	197.74	9.44	Overburden		7.62	9.14	0.00	0.25	Topsoil			Black
										0.25	2.90	Clay	Silt	Till	Brown
										2.90	5.49	Clay	Silt	Till	Grey
										5.49	9.14	Clay	Gravel	Silt	Brown
										9.14	9.44	Sand	Gravel	Silt	Grey
2810077	04/22/04	594088	4825352	207.63	4.5	Overburden		0.50	4.50	0.00	0.90	Sand	Silt		Brown
										0.90	4.50	Silt	Sand	Gravel	Brown
2810584	06/02/06	592962	4823718	197.23	6.1	Overburden		3.00	6.10	0.00	0.20	Topsoil			Brown
										0.20	1.50	Clay	Silt	Dry	Brown
										1.50	3.00	Clay	Dry		Brown
										3.00	3.60	Clay			Grey
										3.60	6.10	Sand	Water-bearing		Brown
7040681	01/12/07	592742	4824698	201.32	36.576	Bedrock				0.00	4.57	Clay	Stones		Brown
										4.57	11.28	Clay	Stones		Grey
										11.28	36.58	Shale			Red
7040682	01/11/07	592823	4824888	200.24	30.48	Bedrock				0.00	5.49	Clay	Stones		Brown
										5.49	15.24	Clay	Stones		Grey
										15.24	16.46	Clay	Fine Sand		Grey
										16.46	30.48	Shale			Red
7043049	04/17/07	593077	4823938	195.62	29.9	Overburden		28.04	29.87	0.00	6.10	Clay			Brown
										6.10	28.04	Clay			Grey
										28.04	29.87	Sand			Grey
7043050	04/17/07	593124	4823973	195.25	41.8	Overburden		38.40	41.76	0.00	6.10	Clay			Brown
										6.10	28.04	Clay			Grey
										28.04	41.76	Sand			Grey
7043051	04/17/07	593092	4823928	195.71	17.4	Overburden		15.85	17.37	0.00	6.10	Clay			Brown
										6.10	15.85	Clay			Grey

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										15.85	17.37	Gravel			Grey
7044751	04/04/07	593321	4823513	193.35	4.5	Overburden		3.00	4.50	0.00	0.60	Topsoil			
										0.60	4.50	Clay	Till	Water-bearing	
7045829	06/15/06	593085	4823921	195.76	35.1	Overburden		29.26	35.05	0.00	28.04	Clay			Grey
										28.04	35.05	Sand			Grey
7045830	06/15/06	593075	4823960	195.43	42.1	Overburden		39.32	42.06	0.00	27.43	Clay			Grey
										27.43	42.06	Sand			Grey
7047017	06/07/07	593135	4823943	195.57	6.09	Overburden				0.00	17.60	Clay			Brown
										17.60	18.59	Gravel			
										18.59	28.04	Clay	Stones		Brown
										28.04	35.05	Sand	Coarse Sand		Brown
										35.05	40.53	Sand	Fine Sand		Brown
7053103	11/20/07	593124	4823973	195.25	42.7	Overburden									
7053104	11/20/07	593092	4823928	195.71	18.3	Overburden									
7053105	11/20/07	593077	4823938	195.62	30.8	Overburden									
7053111	11/01/07	593075	4823960	195.43	10	Overburden									
7053136	11/20/07	593135	4823943	195.57	25	Overburden									
7053137	11/20/07	593085	4823921	195.76	35.7	Overburden									
7053192	11/24/07	593356	4823990	195.64	9.2	Overburden				0.00	0.50				
										0.50	2.70	Sand			
7053442	10/01/07	593160	4823360	194.78	6.096	Overburden				0.00	3.05	Clay			Brown
										3.05	6.10	Clay		Dry	Grey
7053661	11/19/07	593626	4824722	198.15	7.75	Overburden									
7100096	10/31/07	593075	4823960	195.43	43	Overburden									
7103513	01/21/08	594587	4825623	205.36	15	Overburden				0.00	3.30	Clay		Loose	Brown
										3.30	6.60	Sand	Silt	Hard	Brown
										6.60	13.30	Silt	Clay	Hard	Grey
										13.30	15.00	Sand	Silt	Soft	Brown
7105644	03/14/07	593282	4824042	195.50	7.6	Overburden		4.60	7.60	0.00	3.00	Silt	Clay	Stones	Brown
										3.00	6.10	Clay	Silt		Grey
										6.10	7.60	Clay	Sand	Gravel	Grey
7116237	11/08/08	593291	4824924	201.98	7.6	Overburden				0.00	7.62				
7116560	11/24/08	593492.9	4824631	199.37	8.738616	Overburden									
7118823	04/01/08	593570	4823806	195.07	3.6	Overburden		3.00	3.60	0.00	1.00	Silt	Sand		Brown
										0.00	3.60	Sand	Silt	Till	
7121256	01/15/09	593484	4824748	200.55	17.37	Overburden	2.28			0.00	8.53	Previously Dug			
										8.53	10.66	Silt	Clay	Layered	Grey
										10.66	13.71	Silt			Grey

WWR Data							Water Level/Screen Data			Lithologic Data					
MOECC Well ID	Completion Date	Easting	Northing	Ground Surface Elevation (m asl)	Total Depth (m)	Completion Depth	Static Water Level (m asl)	Screen Top (m bgs)	Screen Bottom (m bgs)	Strata Top (m bgs)	Strata Bottom (m bgs)	Mat1	Mat2	Mat3	Colour
										13.71	16.76	Sand			Grey
										16.76	17.37	Sand	Gravel	Coarse-grained	Grey
7123720	05/22/09	593331	4823976	195.97	6.2	Overburden		3.10	6.20	0.00	0.00				
7125991	02/06/09	593252	4824878	201.55	10	Overburden				0.00	0.00				
7127651	01/13/09	593250	4824877	201.55	24.4	Bedrock				0.00	0.40	Topsoil			Brown
										0.40	4.00	Clay			
										4.00	7.60	Clay			Grey
										7.60	15.70	Clay	Stones		
										15.70	17.60	Sand	Stones	Silt	
										17.60	19.20	Gravel	Sand	Silt	
										19.20	24.40	Sand	Clay	Silt	
										24.40	28.20	Shale			Grey
7127652	01/29/09	593254	4824880	201.57	24.1	Bedrock				0.00	0.40	Topsoil			Brown
										0.40	3.80	Clay			
										3.80	15.70	Clay	Stones		Grey
										15.70	20.40	Clay	Till		
										20.40	24.10	Clay	Gravel		
										24.10	25.60	Shale			Grey
7134271	11/05/09	592880	4823576	199.02	5	Overburden				0.00	0.00				
7134673	08/20/09	592350	4823958	198.49	10	Overburden				0.00	0.00				
7134674	08/20/09	592350	4823958	198.49	10	Overburden				0.00	0.00				
7135633	01/26/09	593246	4824874	201.53	18.6	Overburden	3.39	18.60	19.50	0.00	0.40	Topsoil			Brown
										0.40	2.40	Clay	Topsoil	Silt	Brown
										2.40	8.80	Clay	Gravel		Grey
										8.80	16.60	Clay	Gravel	Stones	
										16.60	17.50	Till	Silt	Sand	
										17.50	18.60	Sand	Gravel	Silt	
										18.60	19.40	Gravel	Sand		
										19.40	22.30	Clay	Gravel	Silt	
7136538	09/16/09	594074	4825207	207.33	10	Overburden				0.00	0.00				
7138700	01/01/09	593674	4825549	204.53	9.7536	Bedrock				0.00	0.30	Topsoil			Brown
										0.30	3.66	Clay			Brown
										3.66	7.62	Silt			Grey
										7.62	9.75	Sand	Silt		Grey
										9.75	10.97	Shale			Red
7139556	06/16/09	593361	4824275	195.46	10	Overburden				0.00	0.00				
7144732	02/02/09	593604	4824692	198.64	6.096	Overburden		3.05	6.10	0.00	3.05	Clay	Silt	Other	Brown
										3.05	6.10	Clay	Soft	Other	Grey
7145956	05/17/10	592523	4822909	195.43	1.00584	Overburden				0.00	0.09	Topsoil			Black

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										0.09	1.01	Silt	Clay		Brown
										1.01	0.00				
7145957	05/17/10	592553	4822946	194.75	0.94488	Overburden				0.00	0.09	Topsoil			Black
										0.09	0.94	Silt	Clay		Brown
7148044	06/18/10	593322	4824019	195.99	10	Overburden				0.00	0.00				
7154433	11/04/10	592972	4823698	197.73	1.40208	Overburden		0.46	1.40	0.00	0.00				
7154434	11/04/10	593148	4823358	195.07	4.6	Overburden		1.50	4.60	0.00	0.00				
7162437	11/02/10	592100	4824329	210.55	19.812	Bedrock	9.14	16.76	19.81	0.00	3.96	Clay			Brown
										3.96	8.53	Clay		Silty	Grey
										8.53	19.81	Fine Sand			Grey
										19.81	20.42	Shale			Blue
7162489	03/24/11	593581	4824657	199.19	4.572	Overburden		1.52	4.57	0.00	1.52	Gravel	Sand	Till	Brown
										1.52	4.57	Sand	Silt	Gravel	Grey
7168501	07/05/11	594041	4825394	206.16	6.096	Overburden		3.05	6.10	0.00	0.61	Fill		Loose	Brown
										0.61	3.05	Silt	Clay	Soft	Brown
										3.05	6.10	Silt		Hard	Grey
7178193	02/14/12	594271	4825295	206.22	10	Overburden				0.00	0.00				
7178233	01/27/12	594242	4825260	207.25	13.1064	Overburden				0.00	1.52	Fill			Brown
										1.52	13.11				Grey
7178234	01/27/12	594203	4825232	207.75	3.9624	Overburden	0.91			0.00	1.22	Fill			Brown
										1.22	3.96				Grey
7178235	01/27/12	594145	4825240	208.30	3.9624	Overburden	0.91			0.00	1.22	Fill			Brown
										1.22	3.96				Grey
7178236	01/27/12	594200	4825244	207.82	17.0688	Overburden	0.91			0.00	1.52	Fill			Brown
										1.52	17.07				Grey
7178428	02/13/12	594614	4825199	203.41	9.5	Overburden		8.00	9.50	0.00	5.00	Silt	Sand	Packed	Brown
										5.00	9.50	Sand	Silt	Packed	Brown
7178429	02/13/12	594615	4825196	203.45	18	Overburden		16.50	18.00	0.00	5.00	Silt	Sand	Packed	Brown
										5.00	10.50	Sand	Silt	Packed	Brown
										10.50	13.00	Clay	Silt	Dense	Grey
										13.00	18.00	Sand	Gravel	Dense	Grey
7185907	06/11/12	594495	4825445	206.23	32	Overburden				0.00	0.00				
7185908	05/26/12	594199	4825359	205.82	12.2	Overburden				0.00	0.00				
7186054	07/30/12	594100	4825239	208.50	4.6	Overburden		4.57	1.52	0.00	3.96	Fill			Brown
										3.96	4.27	Other			Grey
										4.27	4.57	Sand			Brown
7187632	09/11/12	594144	4825375	205.98	4.54	Overburden		0.00	4.54	0.00	0.00				
7202375	06/11/12	594730	4825491	203.23	3	Overburden				0.00	0.00				
7207847	07/22/13	592702	4823506	199.32	25	Overburden		15.00	25.00	0.00	5.00	Clay			Brown

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										5.00	15.00	Clay	Till		Brown
										15.00	25.00	Sand			Brown
7209074	09/05/13	591176	4825133	224.52	12.192	Bedrock	7.32			0.00	0.30	Topsoil			Brown
										0.30	3.96	Clay	Stones		Brown
										3.96	7.62	Clay	Sand	Stones	Brown
										7.62	9.75	Sand			Grey
										9.75	12.19	Shale			Red
7232813	10/01/14	592052	4823072	200.35	43.3	Bedrock				0.00	6.71	Clay			Brown
										6.71	12.19	Shale			White
										12.19	15.24	Shale			Grey
										15.24	43.28	Shale			Blue
7239874	01/20/15	592465	4823229	200.51	4.6	Overburden		2.50	4.60	0.00	1.50	Sand		Loose	Brown
										1.50	4.60	Clay	Silt	Packed	Brown
7239875	01/20/15	592211	4822867	201.93	5.5	Overburden		2.50	5.50	0.00	1.50	Sand		Loose	Brown
										1.50	4.60	Clay		Packed	Brown
										4.60	5.50	Clay	Silt	Packed	Grey
7239876	01/20/15	592464	4823848	197.31	3.8	Overburden		2.50	3.80	0.00	1.50	Sand		Loose	Brown
										1.50	3.80	Clay	Silt	Packed	Brown
7239877	01/20/15	593360	4824363	197.76	6.1	Overburden		3.10	6.10	0.00	1.50	Sand		Loose	Brown
										1.50	4.60	Clay		Packed	Brown
										4.60	6.10	Clay	Silt	Packed	Grey
7239878	01/20/15	592976	4823851	196.06	7.6	Overburden		4.60	7.60	0.00	1.50	Sand		Loose	Brown
										1.50	4.60	Clay		Packed	Brown
										4.60	7.60	Clay	Silt	Packed	Grey