

ELC
Community Description and Classification

Map #: 227GSH1605 Polygon:
Surveyor(s): Jess Paeth + Tom Stowley Date: April 16, 2013 Time start: 11:58am finish: 3:10pm
UTMZ: UTMZ: UTMN:

Polygon Description

System	Substrate	Topographic Feature	Plant Form	Community
<input checked="" type="checkbox"/> Terrestrial <input type="checkbox"/> Wetland <input type="checkbox"/> Aquatic	<input type="checkbox"/> Organic <input checked="" type="checkbox"/> Mineral Soil <input type="checkbox"/> Parent Min. <input type="checkbox"/> Acidic Bedrk <input type="checkbox"/> Basic Bedrk <input type="checkbox"/> Carb. Bedrk	<input type="checkbox"/> Lacustrine <input type="checkbox"/> Riverine <input type="checkbox"/> Bottomland <input type="checkbox"/> Terrace <input checked="" type="checkbox"/> Valley Slope <input type="checkbox"/> Tableland <input type="checkbox"/> Roll. Upland <input type="checkbox"/> Cliff <input type="checkbox"/> Talus <input type="checkbox"/> Crevice/Cave <input type="checkbox"/> Alvar <input type="checkbox"/> Rockland <input type="checkbox"/> Beach / Bar <input type="checkbox"/> Sand Dune <input type="checkbox"/> Bluff	<input type="checkbox"/> Plankton <input type="checkbox"/> Submerged <input type="checkbox"/> Floating-LVD. <input type="checkbox"/> Graminoid <input type="checkbox"/> Forb <input type="checkbox"/> Lichen <input type="checkbox"/> Bryophyte <input type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed	<input type="checkbox"/> Lake <input type="checkbox"/> Pond <input type="checkbox"/> River <input type="checkbox"/> Stream <input type="checkbox"/> Marsh <input type="checkbox"/> Swamp <input type="checkbox"/> Fen <input type="checkbox"/> Bog <input type="checkbox"/> Barren <input type="checkbox"/> Meadow <input type="checkbox"/> Prairie <input type="checkbox"/> Thicket <input type="checkbox"/> Savannah <input type="checkbox"/> Woodland <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Plantation

Stand Description

Layer	HT	CVR	Species In Order of Decreasing Dominance (up to 4 sp) (>> Much Greater Than; > Greater Than; = About Equal To)
1	4	2	Tilamer - Alesack - OSTVing - Framer
2	3	3	Tilamer > WILCHMER > Elyptus
3	4	2	Tilamer > RibOC > Pruvig
4	6	4	grass sp. = Solidag. ov. - Symplyctochlor. sp. > tilamer

HT Codes: 7 < 0.2m 6 > 0.2-0.5m 5 > 0.5-1m 4 > 1-2m 3 > 2-6m 2 > 6-25m 1 > 25m
CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition:	Size Class Analysis:
	A < 10 4 10-24 O 25-50 R > 50
	Standing Snags: N < 10 R 10-24 R 25-50 N > 50
BA:	Deadfall / Logs: O < 10 O 10-24 R 25-50 N > 50

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

Com. Age:	<input type="checkbox"/> Pioneer	<input checked="" type="checkbox"/> Young	<input checked="" type="checkbox"/> Mid-Age	<input type="checkbox"/> Mature	<input type="checkbox"/> Old Growth
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Ecosite:	Fresh-Moist Sugar maple Deciduous Ecote	Code:	F0D6
Vegetation Type:	Fresh-Moist Sugar Maple-Hardwood Deciduous Forest type	Code:	F0D6-5
Inclusion:	Mineral Cultural Woodland	Code:	CW1
Complex:		Code:	

Community Profile Diagram/Comments

* Area is currently being used as a memorial Park with trails throughout cultural meadow and forest area. Several newly planted trees line the area and new trails are being constructed.

* Mineral cultural woodland has aleasack, Prupens, OSTVing, Tilamer

Notes: ➔ microtopography is undulating creating a large number of pools

Tree Tally by Species

Species	Tally 1	Tally 2	Tally 3	Tally 4	Total	Rel. Avg.
Total						100
Basal Area (BA)						
Dead						

Prism Factor 2

Soils Ontario and ELC Soils Description

Site Metrics	Pit/Auger #	Summary				
		Moisture Regime		Drainage		
UTM	Zone					
	Easting					
Slope	Northing					
	Position					
	Aspect					
	Percent					
	Slope Length					
Depth to...	Mottles					
	Gley					
	Water Table					
	Carbonates					
	Bedrock					
Soil Horizon Description	1	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	2	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	3	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	4	Depth from zero	% CF	% CF	% CF	% CF
		Texture				
	% Surface Stone/Rock					
Moisture Regime						
Drainage						

* Community on North side of ravine is a lot less mature (young) than community on the south side of ravine though it has the same vegetation composition.

ELC Community Description and Classification	Map #: <i>227 GSH 1605</i>	Polygon:		
	Surveyor(s): <i>Jess Piette + Tom ^{Stake}</i>	Date: <i>7 April 16, 2013</i>	Time start: <i>11:58 am</i>	finish: <i>3:10 P.M.</i>
	UTMZ:	UTMZ:	UTMN:	

Polygon Description

System	Substrate	Topographic Feature	Plant Form	Community
<input checked="" type="checkbox"/> Terrestrial <input type="checkbox"/> Wetland <input type="checkbox"/> Aquatic	<input type="checkbox"/> Organic <input checked="" type="checkbox"/> Mineral Soil <input type="checkbox"/> Parent Min. <input type="checkbox"/> Acidic Bedrk <input type="checkbox"/> Basic Bedrk <input type="checkbox"/> Carb. Bedrk	<input type="checkbox"/> Lacustrine <input type="checkbox"/> Riverine <input type="checkbox"/> Bottomland <input type="checkbox"/> Terrace <input type="checkbox"/> Valley Slope <input checked="" type="checkbox"/> Tableland <input type="checkbox"/> Roll. Upland <input type="checkbox"/> Cliff <input type="checkbox"/> Talus <input type="checkbox"/> Crevice/Cave <input type="checkbox"/> Alvar <input type="checkbox"/> Rockland <input type="checkbox"/> Beach / Bar <input type="checkbox"/> Sand Dune <input type="checkbox"/> Bluff	<input type="checkbox"/> Plankton <input type="checkbox"/> Submerged <input type="checkbox"/> Floating-LVD. <input type="checkbox"/> Graminoid <input checked="" type="checkbox"/> Forb <input type="checkbox"/> Lichen <input type="checkbox"/> Bryophyte <input type="checkbox"/> Deciduous <input type="checkbox"/> Coniferous <input type="checkbox"/> Mixed	<input type="checkbox"/> Lake <input type="checkbox"/> Pond <input type="checkbox"/> River <input type="checkbox"/> Stream <input type="checkbox"/> Marsh <input type="checkbox"/> Swamp <input type="checkbox"/> Fen <input type="checkbox"/> Bog <input type="checkbox"/> Barren <input checked="" type="checkbox"/> Meadow <input type="checkbox"/> Prairie <input type="checkbox"/> Thicket <input type="checkbox"/> Savannah <input type="checkbox"/> Woodland <input type="checkbox"/> Forest <input type="checkbox"/> Plantation
Site	<input type="checkbox"/> Open Water <input type="checkbox"/> Shallow Water <input checked="" type="checkbox"/> Surficial Dep. <input type="checkbox"/> Bedrock			
History	<input type="checkbox"/> Natural <input checked="" type="checkbox"/> Cultural			
Cover	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Shrub <input type="checkbox"/> Treed			

Stand Description

Layer	HT	CVR	Species In Order of Decreasing Dominance (up to 4 sp) (>> Much Greater Than; > Greater Than; = About Equal To)
1	2	1	Ulm Amer
2			
3			
4	5	4	PharTun > Dacglan = Sol sp

HT Codes: 7 <0.2m 8 >0.2-0.5m 5 >0.5-1m 4 >1-2m 3 >2-6m 2 >6-25m 1 >25m
 CVR Codes: 0 = none 1 0% - 10% 2 10 - 25% 3 25 - 60% 4 > 60%

Stand Composition:	Size Class Analysis:	<input type="checkbox"/> <10	<input type="checkbox"/> 10-24	<input type="checkbox"/> 25-50	<input type="checkbox"/> >50
	Standing Snags:	<input type="checkbox"/> <10	<input type="checkbox"/> 10-24	<input type="checkbox"/> 25-50	<input type="checkbox"/> >50
BA:	Deadfall / Logs:	<input type="checkbox"/> <10	<input type="checkbox"/> 10-24	<input type="checkbox"/> 25-50	<input type="checkbox"/> >50

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

Com. Age: Pioneer Young Mid-Age Mature Old Growth

Ecosite:	<i>mineral cultural meadow</i>	Code:	<i>CUM</i>
Vegetation Type:	<i>Dry-moist old field cultural meadow</i>	Code:	<i>CUM 1-1</i>
Inclusion:		Code:	
Complex:		Code:	

Community Profile Diagram/Comments

Notes:

Tree Tally by Species

Prism Factor	<i>2</i>
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Species	Tally 1	Tally 2	Tally 3	Tally 4	Total	Rel. Avg.
Total						100
Basal Area (BA)						
Dead						

Soils Ontario and ELC Soils Description

Site Metrics		Pit/Auger #					Summary
UTM	Zone					Moisture Regime	
	Easting						
	Northing						
Slope	Position					Drainage	
	Aspect						
	Percent						
		Slope Length					
Depth to...	Mottles					Effective Texture (indicate below)	
	Gley						
	Water Table						
	Carbonates						
	Bedrock						
Soil Horizon Description	1	Depth from zero		% CF	% CF	% CF	% CF
		Texture					
	2	Depth from zero		% CF	% CF	% CF	% CF
		Texture					
	3	Depth from zero		% CF	% CF	% CF	% CF
		Texture					
	4	Depth from zero		% CF	% CF	% CF	% CF
		Texture					
			% Surface Stone/Rock				
			Moisture Regime				
			Drainage				

Plant Species List

2012

Trees & Shrubs						Tree & Shrubs						Graminoids					
1	2	3	4	5		1	2	3	4	5		1	2	3	4	5	
Conifers						Deciduous						Grasses					
Balsam Fir (<i>Abies balsamea</i>)						White Oak (<i>Quercus alba</i>)						Giant Redtop (<i>Agrostis gigantea</i>)					
Common Juniper (<i>Juniperus communis</i>)						Bur Oak (<i>Quercus macrocarpa</i>)					R	Redtop (<i>Agrostis stolonifera</i>)					
Eastern Red Cedar (<i>Juniperus virginiana</i>)						Red Oak (<i>Quercus rubra</i>)						Awnless Brome (<i>Bromus inermis</i>)					
Tamarack (<i>Larix laricina</i>)						Alder Buckthorn (<i>Rhamnus alnifolia</i>)						Bromus					
Norway Spruce (<i>Picea abies</i>)						Common Buckthorn (<i>Rhamnus cathartica</i>)				R		Blue-joint Grass (<i>Calamagrostis canadensis</i>)					
White Spruce (<i>Picea glauca</i>)						Smooth Sumac (<i>Rhus glabra</i>)						Orchard Grass (<i>Decllylis glomerata</i>)				U	U
Black Spruce (<i>Picea mariana</i>)						Staghorn Sumac (<i>Rhus hirta</i>)					R	Poverty Oat Grass (<i>Danthonia spicata</i>)					
Jack Pine (<i>Pinus banksiana</i>)						Wild Black Currant (<i>Ribes americanum</i>)						Quick Grass (<i>Elymus repens</i>)					
Red Pine (<i>Pinus resinosa</i>)						Prickly Gooseberry (<i>Ribes cynosbati</i>)						Virginia Wild Rye (<i>Elymus virginicus</i>)					
Eastern White Pine (<i>Pinus strobus</i>)						Swamp Black Currant (<i>Ribes lacustre</i>)						Elymus					
Scotch Pine (<i>Pinus sylvestris</i>)						Red Currant (<i>Ribes rubrum</i>)						Fowl Manna Grass (<i>Glyceria striata</i>)					
Canada Yew (<i>Taxus canadensis</i>)						Ribes						Glyceria					
Eastern White Cedar (<i>Thuja occidentalis</i>)						Black Locust (<i>Robinia pseudo-acacia</i>)						Rice Cut Grass (<i>Leersia oryzoides</i>)					
Eastern Hemlock (<i>Tsuga canadensis</i>)	R					Prickly Rose (<i>Rosa acicularis</i>)						Tall Fescue (<i>Lolium arundinaceum</i>)					
						Smooth Rose (<i>Rosa blanda</i>)						Muhlenbergia					
						Multiflora Rose (<i>Rosa multiflora</i>)						Witch-grass (<i>Panicum capillare</i>)					
						Rose <i>sp.</i>					R	Panicum					
Deciduous						Com. Blackberry (<i>Rubus alleghaniensis</i>)						Reed Canary Grass (<i>Phalaris arundinacea</i>)	R	F	F		
Manitoba Maple (<i>Acer negundo</i>)						Wild Red Raspberry (<i>Rubus idaeus</i>)					U	Timothy (<i>Phleum pratense</i>)					
Black Maple (<i>Acer nigrum</i>)						Black Raspberry (<i>Rubus occidentalis</i>)						Common Reed (<i>Phragmites australis</i>)					
Norway Maple (<i>Acer platanoides</i>)						Purple-fl. Raspberry (<i>Rubus odoratus</i>)						Canada Blue Grass (<i>Poa compressa</i>)					
Red Maple (<i>Acer rubrum</i>)						Dwarf Raspberry (<i>Rubus pubescens</i>)						Fowl Meadow Grass (<i>Poa palustris</i>)					
Silver Maple (<i>Acer saccharinum</i>)						Rubus						Kentucky Bluegrass (<i>Poa pratensis</i>)					
Freeman's Maple (<i>Acer X freemanii</i>)						Peach-leaved Willow (<i>Salix amygdaloides</i>)						Yellow Foxtail (<i>Setaria pumila</i>)					
Sugar Maple (<i>Acer saccharum</i>)	F	U				Bebb's Willow (<i>Salix bebbiana</i>)						Green Foxtail (<i>Setaria viridis</i>)					
Mountain Maple (<i>Acer spicatum</i>)						Pussy Willow (<i>Salix discolor</i>)											
Speckled Alder (<i>Alnus incana</i>)						Missouri Willow (<i>Salix eriocephala</i>)											
Downy Serviceberry (<i>Amenanchier arborea</i>)						Sandbar Willow (<i>Salix exigua</i>)											
Serviceberry (<i>Amenanchier sanguinea</i>)						Shining Willow (<i>Salix lucida</i>)											
Yellow Birch (<i>Betula alleghaniensis</i>)						Black Willow (<i>Salix nigra</i>)											
White Birch (<i>Betula papyrifera</i>)						Slender Willow (<i>Salix petiolata</i>)											
European Birch (<i>Betula pendula</i>)						Salix											
Blue Beech (<i>Carpinus caroliniana</i>)						Hybrid Crack Willow (<i>Salix X rubens</i>)											
Bitternut Hickory (<i>Carya cordiformis</i>)						Black-barked Elder (<i>Sambucus nigra</i>)											
Shagbark Hickory (<i>Carya ovata</i>)						Red-barked Elder (<i>Sambucus racemosa</i>)											
Climbing Bittersweet (<i>Celastrus scandens</i>)						Buffaloberry (<i>Shepherdia canadensis</i>)											
Common Hackberry (<i>Celtis occidentalis</i>)						Eur. Mountain Ash (<i>Sorbus aucuparia</i>)											
Buttonbush (<i>Cophalanthus occidentalis</i>)						Narrow Meadow-sweet (<i>Spiraea alba</i>)											
Alt.-leaved Dogwood (<i>Cornus alternifolia</i>)						Common Lilac (<i>Syringa vulgaris</i>)											
Silky Dogwood (<i>Cornus amomum</i>)						Poison-ivy (<i>Toxicodendron rydbergii</i>)											
Bunchberry (<i>Cornus canadensis</i>)						Climbing Poison-ivy (<i>Toxicodendron radicans</i>)	R										
Gray dogwood (<i>Cornus racemosa</i>)	R					White Elm (<i>Ulmus americana</i>)		U	R	R							
Round-leaved Dogwood (<i>Cornus rugosa</i>)						Siberian Elm (<i>Ulmus pumila</i>)											
Red-osier Dogwood (<i>Cornus sericea</i>)						Slippery Elm (<i>Ulmus rubra</i>)											
American Hazel (<i>Corylus americana</i>)						Low Blueberry (<i>Vaccinium angustifolium</i>)											
Beaked Hazel (<i>Corylus cornuta</i>)						Maple-leaf Viburnum (<i>Viburnum acerifolium</i>)											
Cockspur Thorn (<i>Crataegus crus-galli</i>)						Hobblebush (<i>Viburnum lentago</i>)											
English Hawthorn (<i>Crataegus monogyna</i>)						Nannyberry (<i>Viburnum lentago</i>)											
Large-fruited Thorn (<i>Crataegus punctata</i>)						Guelder-Rose (<i>Viburnum opulus</i>)											
Crataegus						Downy Arrow-wood (<i>Vib. rafinesquianum</i>)											
Bush Honeysuckle (<i>Lonicera ligoceras</i>)						Riverbank Grape (<i>Vitis riparia</i>)					R						
Russian Olive (<i>Elaeagnus angustifolia</i>)						Am. Prickly-ash (<i>Zanthoxylum americanum</i>)											
Autumn Olive (<i>Elaeagnus umbellata</i>)																	
Run. Strawberry-bush (<i>Eucnymus obovate</i>)						Tilapia					F						
American Beech (<i>Fagus grandifolia</i>)	F																
Glossy Buckthorn (<i>Frangula alnus</i>)																	
White Ash (<i>Fraxinus americana</i>)	F																
Black Ash (<i>Fraxinus nigra</i>)																	
Green Ash (<i>Fraxinus pennsylvanica</i>)																	
Witch-hazel (<i>Hamamelis virginiana</i>)		U				Ferns & Allies											
Winterberry (<i>Ilex verticillata</i>)						Lady Fern (<i>Athyrium filix-femina</i>)											
Butternut (<i>Juglans cinerea</i>)						Rattlesnake Fern (<i>Botrychium virginicum</i>)											
Black Walnut (<i>Juglans nigra</i>)						Bulbet Bladder Fern (<i>Cystopteris bulbifera</i>)											
Common Privet (<i>Ligustrum vulgare</i>)						Spin. Wood Fern (<i>Dryopteris carthusiana</i>)											
Spicebush (<i>Lindera benzoin</i>)						Crested Wood Fern (<i>Dryopteris cristata</i>)											
Fly Honeysuckle (<i>Lonicera canadensis</i>)						Marginal Wood Fern (<i>Dryopteris marginalis</i>)											
Glaucous Honeysuckle (<i>Lonicera dioica</i>)						Dryopteris											
Morrow's Honeysuckle (<i>Lonicera morrowii</i>)						Ostrich Fern (<i>Mattuceola struthiopteris</i>)											
Tartarian Honeysuckle (<i>Lonicera tatarica</i>)						Sensitive Fern (<i>Onoclea sensibilis</i>)											
Common Apple (<i>Malus pumila</i>)						Cinnamon Fern (<i>Osmunda cinnamomea</i>)											
White Mulberry (<i>Morus alba</i>)						Interrupted Fern (<i>Osmunda cistiflora</i>)											
Sweet Gale (<i>Myrica gale</i>)						Royal Fern (<i>Osmunda regalis</i>)											
Ironwood (<i>Ostrya virginiana</i>)		U				Christmas Fern (<i>Polystichum acrostichoides</i>)											
Thicket-creeper (<i>Parthenocissus inserta</i>)						Eastern Bracken-fern (<i>Pteridium aquilinum</i>)											
Ninebark (<i>Physocarpus opulifolius</i>)						Marsh Fern (<i>Thelypteris palustris</i>)											
Balsam Poplar (<i>Populus balsamifera</i>)																	
Eastern Cottonwood (<i>Populus deltoides</i>)						Field Horsetail (<i>Equisetum arvense</i>)											
Large-tooth Aspen (<i>Populus grandidentata</i>)						Scouring-rush (<i>Equisetum hyemale</i>)											
Trembling Aspen (<i>Populus tremuloides</i>)						Variegated Horsetail (<i>Equisetum variegatum</i>)											
Sweet Cherry (<i>Prunus avium</i>)						Equisetum											
Pin Cherry (<i>Prunus pensylvanica</i>)						Ground-cedar (<i>Lycopodium digitatum</i>)											
Black Cherry (<i>Prunus serotina</i>)	R					Shining Clubmoss (<i>Lycopodium lucidulum</i>)											
Choke Cherry (<i>Prunus virginiana</i>)	U					Ground-pine (<i>Lycopodium obscurum</i>)											
Prunus																	

D - Dominant: represented by large numbers; generally forming >10% ground cover or >25% vegetation cover in any one stratum

F - Fairly common (Abundant in ELQ): generally widespread represented by fairly large numbers of individual clumps; usually forming >10% ground cover

U - Uncommon (Occasional in ELQ): present as widespread scattered individuals or represented by one or more clumps of many individuals (most species will fall into this category)

R - Rare: represented in the polygon by less than about five individuals or small clumps

Map Number:	7276SH1605	1	2	3	4	5
Date:	April 16, 2013					
Surveyors:	JPLS					

F006-5	4
CAW 1	3
CUM 1-1	

Plant Species List
2012

Dicot Herba - Asteraceae						Dicot Herba						Dicot Herba					
1	2	3	4	5		1	2	3	4	5		1	2	3	4	5	
Common Yarrow (<i>Achillea millefolium</i>)						Shepherd's Purse (<i>Capsella bursa-pastoris</i>)						Kidney-leaf Buttercup (<i>Ranunculus abortivus</i>)					
White Snakeroot (<i>Ageratina altissima</i>)						Cutleaf Toothwort (<i>Cardamine concatenata</i>)						Tall Buttercup (<i>Ranunculus acris</i>)					
Com. Ragweed (<i>Ambrosia artemisiifolia</i>)						Toothwort (<i>Cardamine diphyle</i>)						Hooked Buttercup (<i>Ranunculus recurvatus</i>)					
Giant Ragweed (<i>Ambrosia trifida</i>)						Penn. Bitter-cress (<i>Cardamine pennsylvanica</i>)						<i>Ranunculus</i>					
Field Pusytoes (<i>Antennaria neglecta</i>)						<i>Cardamine</i>						Sheep Sorrel (<i>Rumex acetosella</i>)					
<i>Artemisia</i>						Blue Cohosh (<i>Caulophyllum thalictroides</i>)						Curly-leaf Dock (<i>Rumex crispus</i>)					
Common Burdock (<i>Arctium minus</i>)						Mouse-ear Chickweed (<i>Cerastium fontanum</i>)						Bitter Dock (<i>Rumex obtusifolius</i>)					
Nodding Beggar-ticks (<i>Bidens cernua</i>)						Turtlehead (<i>Chelone glabra</i>)						Bloodroot (<i>Sanguinaria canadense</i>)					
Devil's Beggar-ticks (<i>Bidens frondosa</i>)						Spotted Water-hemlock (<i>Cicuta maculata</i>)						Black Snakeroot (<i>Sanicula marilandica</i>)					
Spotted Knapweed (<i>Centaurea biebersteinii</i>)						Water-hemlock (<i>Cicuta virosa</i>)						Bouncing Bet (<i>Saponaria officinalis</i>)					
Brown Knapweed (<i>Centaurea jacea</i>)						Enchanter's Nightshade (<i>Circaea lutetiana</i>)				U		Marsh Skullicap (<i>Scutellaria galericulata</i>)					
Chicory (<i>Cichorium intybus</i>)						Caroline Spring Beauty (<i>Claytonia caroliniana</i>)						Mad Dog Skullicap (<i>Scutellaria lateriflora</i>)					
Canada Thistle (<i>Cirsium arvense</i>)						Virginia Spring Beauty (<i>Claytonia virginica</i>)						White Campion (<i>Silene latifolia</i>)					
Bull Thistle (<i>Cirsium vulgare</i>)						Virgin's-bower (<i>Clematis virginiana</i>)						Bladder Campion (<i>Silene vulgaris</i>)					
Horseweed (<i>Coryza canadensis</i>)						Field Bindweed (<i>Convolvulus arvensis</i>)						Hemlock Water-parasit (<i>Sium suave</i>)					
Daisy Fleabane (<i>Erigeron annuus</i>)						Dog-strangling Vine (<i>Cynanchum rossicum</i>)						Bitter Nightshade (<i>Solanum dulcamara</i>)					
Philadelphus Fleabane (<i>Erig. philadelphicus</i>)						Wild Carrot (<i>Daucus carota</i>)				U	U	Black Nightshade (<i>Solanum ptychanthum</i>)					
<i>Erigeron</i>						Deptford Pink (<i>Dianthus armeria</i>)						Grassleaf Stitchwort (<i>Stellaria graminea</i>)					
Joe-pye-weed (<i>Eupatorium maculatum</i>)						Squirrel-corn (<i>Dicentra canadensis</i>)						Common Chickweed (<i>Stellaria media</i>)					
Boneset (<i>Eupatorium perfoliatum</i>)						Dutchman's-breeches (<i>Dicentra cucullaria</i>)						Early Meadow-rue (<i>Thalictrum dioicum</i>)					
Large-leaved Aster (<i>Eurybia macrophylla</i>)						Wild Tassel (<i>Dipsacus fulvum</i>)				R	U	Tall Meadow-rue (<i>Thalictrum pubescens</i>)					
Flat-top Goldenrod (<i>Euthamia graminifolia</i>)						Wild Cucumber (<i>Echinocystis lobata</i>)						Field Penny-cress (<i>Thlaspi arvense</i>)					
Orange Hawkweed (<i>Hieracium aurantiacum</i>)						Viper's Bugloss (<i>Echium vulgare</i>)						Foamflower (<i>Tiarella cordifolia</i>)					
Field Hawkweed (<i>Hieracium caespitosum</i>)						Northern Willow-herb (<i>Epiobium alatum</i>)						Star-flower (<i>Trientalis borealis</i>)					
<i>Hieracium</i>						Hairy Willow-herb (<i>Epiobium hirsutum</i>)						Red Clover (<i>Trifolium pratense</i>)					
Elecampane (<i>Inula helenium</i>)						Small-fl. Willow-herb (<i>Epiobium parviflorum</i>)						White Clover (<i>Trifolium repens</i>)					
Prickly Lettuce (<i>Lactuca scariola</i>)						<i>Epiobium</i>						<i>Trifolium</i>					
<i>Lactuca</i>						Worm Mustard (<i>Erysimum cheiranthoides</i>)						Stinging Nettle (<i>Urtica dioica</i>)					
Ox-eye Daisy (<i>Leucanthemum vulgare</i>)						<i>Euphorbia</i>						Greater Bladderwort (<i>Utricularia vulgaris</i>)					
Pineapple-weed (<i>Matricaria discoidea</i>)						Hemp Nettle (<i>Galeopsis tetrahit</i>)						Common Mullein (<i>Verbascum thapsus</i>)					
Tall White Lettuce (<i>Frenanthes altissima</i>)						Wild Madder (<i>Galium mollugo</i>)						Blue Vervain (<i>Verbena hastata</i>)					
Black-eyed Susan (<i>Rudbeckia hirta</i>)						Marsh Bedstraw (<i>Galium palustre</i>)						White Vervain (<i>Verbena urticifolia</i>)					
Tall Goldenrod (<i>Solidago altissima</i>)						Sweet-scented Bedstraw (<i>Galium triflorum</i>)						Water Speedwell (<i>Veron. anagallis-aquatica</i>)					
Blue-stem Goldenrod (<i>Solidago caesia</i>)						<i>Galium</i> $f^{0.4-1.4}$					R	Common Speedwell (<i>Veronica officinalis</i>)					
Canada Goldenrod (<i>Solidago canadensis</i>)						Spotted Geranium (<i>Geranium maculatum</i>)						Veronica					
Zig-zag Goldenrod (<i>Solidago flexilis</i>)						Herb-robert (<i>Geranium robertianum</i>)				U		Cow Vetch (<i>Vicia cracca</i>)					
Giant Goldenrod (<i>Solidago gigantea</i>)						Yellow Avens (<i>Geum aleppicum</i>)						<i>Vicia</i>					
Early Goldenrod (<i>Solidago juncea</i>)						White Avens (<i>Geum canadense</i>)						Periwinkle (<i>Viola minor</i>)					
Gray Goldenrod (<i>Solidago nemoralis</i>)						Urban Avens (<i>Geum urbanum</i>)						Dog Violet (<i>Viola conspersa</i>)					
<i>Solidago</i> $f^{1.1}$			U	U	U	Dame's Rocket (<i>Hesperis matronalis</i>)						Yellow Violet (<i>Viola pubescens</i>)					
Field Sow-thistle (<i>Sonchus olerensis</i>)						Virg. Water-leaf (<i>Hydrophyllum virginianum</i>)						Com. Blue Violet (<i>Viola sororia</i>)					
<i>Sonchus</i>						Com. St. John's-wort (<i>Hypericum perforatum</i>)				R	R	<i>Vicia</i>					
Heart-leaf Aster (<i>Symph. cordifolium</i>)						Spotted Jewelweed (<i>Impatiens capensis</i>)											
Heath Aster (<i>Symphoricarpon angustifolium</i>)						Wood Nettle (<i>Laportea canadensis</i>)											
Tall White Aster (<i>Symph. lanceolatum</i>)						Motherwort (<i>Leonurus cardiaca</i>)											
Calico Aster (<i>Symphoricarpon lateriflorum</i>)						Field Pepperglass (<i>Lepidium campestre</i>)											
New England Aster (<i>Symph. novae-angliae</i>)						Eur. Gromwell (<i>Lithospermum officinale</i>)											
Purple-stem Aster (<i>Symph. purpureus</i>)						Butter & Eggs (<i>Linaria vulgaris</i>)											
Common Tansy (<i>Tanacetum vulgare</i>)						Great Lobelia (<i>Lobelia siphilitica</i>)											
Common Dandelion (<i>Taraxacum officinale</i>)					R U R	<i>Lobelia</i>											
Com. Coltsbeard (<i>Tragopogon pratensis</i>)						Cut-leaf Bugleweed (<i>Lycopus americanus</i>)											
Coltsfoot (<i>Tussilago farfara</i>)						Northern Bugleweed (<i>Lycopus uniflorus</i>)											
<i>Symphoricarpon</i> $f^{1.1}$			U	U		Fringed Loosestrife (<i>Lythrum chittata</i>)											
						Moneywort (<i>Lythrum nummularia</i>)											
						<i>Lythrum</i>											
						Purple Loosestrife (<i>Lythrum salicaria</i>)											
						Black Medick (<i>Medicago lupulina</i>)											
						Alfalfa (<i>Medicago sativa</i>)											
						White Sweet-clover (<i>Melilotus alba</i>)											
						Yellow Sweet-clover (<i>Melilotus officinalis</i>)											
						Wild Mint (<i>Mentha arvensis</i>)											
						Wild Bergamot (<i>Monarda fistulosa</i>)											
						Small Forget-me-not (<i>Myosotis laxa</i>)											
						Forget-me-not (<i>Myosotis scorpioides</i>)											
						Water-cress (<i>Nasturtium officinale</i>)											
						Com. Evening-primrose (<i>Oenothera biennis</i>)											
						Sweet-cicely (<i>Osmorhiza berterii</i>)											
						Yellow Wood-sorrel (<i>Oxalis stricta</i>)											
						Wild Parsnip (<i>Pastinaca sativa</i>)											
						English Plantain (<i>Plantago lanceolata</i>)											
						Common Plantain (<i>Plantago major</i>)											
						Rugel's Plantain (<i>Plantago rugelii</i>)											
						May-apple (<i>Podophyllum peltatum</i>)											
						Pale Smartweed (<i>Polygonum lapathifolium</i>)											
						Lady's-thumb (<i>Polygonum persicaria</i>)											
						Virginia Knotweed (<i>Polygonum virginicum</i>)											
						<i>Polygonum</i>											
						<i>Polygonum</i>											
						Rough Cinquefoil (<i>Potentilla norvegica</i>)											
						Rough-fruited Cinquefoil (<i>Potentilla recta</i>)											
						Common Cinquefoil (<i>Potentilla simplex</i>)											
						<i>Potentilla</i>											
						Heal-all (<i>Prunella vulgaris</i>)					U						
						Shinleaf (<i>Pyrola elliptica</i>)											
						<i>Pyrola</i>											
						<i>Pyrola</i>											

D - Dominant: represented by large numbers, generally forming >10% ground cover or >25% vegetation cover in any one stratum

F - Fairly common (Abundant in ELC) generally widespread represented by fairly large numbers of individual clumps, usually forming >10% ground cover

U - Uncommon (=Occasional in ELC) present as widespread scattered individuals or represented by one or more clumps of many individuals (most species will fall into this category)

R - Rare: represented in the polygon by less than about five individuals or small clumps

Map Number:	92-1 (SH) 605	1	Fib 6-5	a
Date:	Apr 16, 2013	2	CUM 1	b
Surveyors:	JPT/S	3	CUM 1-1	

Significant Wildlife Habitat Form

AECOM

Study Area: BLW (JER) (GSH) Map #: 227-GSH/1605
 Date: 04/16/2013 Time Started: 11:58 am
 Field Staff: Tom Shorney + Jess Pfeiffer Time Finished: 3:10 P.M.
 Weather Conditions: Sunny w/ cloudy periods, 8°C Night breeze

Colonial Nesting Tree/Shrub Birds, Osprey Breeding/Feeding, Bald Eagle Breeding/Nesting Habitat
 (FET1, FOC, FOM, FOD, SWC, SWM, SWD)

Nest bowls present: No Yes (if yes, photograph and complete the following)

UTMs: _____ Number of nests: _____

Description of nests (location, e.g. in tree/on built structure; material; evidence of recent use; birds present): _____

Description of habitat (note riparian areas if present, evidence of disturbance): _____

Waterfowls Stopover/Nesting, Amphibian Breeding, Turtle Nesting/Over-wintering, Marsh Breeding Birds
 (CUM1, CUT1, MAM, MAS, SAS1, SAM1, SAF1, SWD, SWT1, SWT2) (FOC, FOM, FOD, SWC, SWM, SWD, BOO1, FEO1)

Standing water present: No Yes (if yes, photograph and complete the following)

UTMs: 17T 042147, 4791928 Area of standing water delineated on field map

Water depth (m): 40cm % open water: 98% % emergent vegetation: 2%

Potential to hold water until at least July in most years: Yes / No

Description of standing water (permanent pool, evidence of annual spring flooding, etc): Vernal Pool, feature has drainage features leading pond.

Area and soil/substrate of shoreline habitat: loam soils along shoreline,

Type and abundance of cover in open water habitat: 10% cover -> Frax Petrus 98%, Tid Ar 2%

Type and abundance of cover in surrounding habitat: Cultural meadow surrounding pool

Evidence of disturbance (e.g. cattle grazing): Restoration works nearby

Evidence of use by waterfowl, amphibians, turtles (e.g. broken eggs), marsh breeding birds: None

* 3 Pools within our study site

Complete Vernal Pool Habitat Description Form

Snake Hibernacula

Fissured rock/foundation or rock/debris pile present: No Yes (if yes, photograph and complete the following)

UTMs: _____ Likelihood to extend below frost line: _____

% canopy cover: _____ % slope: _____ Distance to open canopy (m): _____

Description of fissure or stone pile (composition/material, dimensions, etc): _____

Description of surrounding habitat (type & abundance of cover, evidence of disturbance, etc): _____

Seeps and Springs (FOC, FOM, FOD, SWC, SWM, SWD)

Evidence of seep or spring: No Yes (if yes, photograph and complete the following)

UTMs: _____ Description (indicator species, etc): _____

NHA Site Investigation - Significant Wildlife Habitat Form

AECOM

Colonial Nesting Bird Breeding Habitat (Bank and Cliff Swallows)
 (CUM1, CUT1, CUS, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1)
 Eroding bank, sandy hill, pits, steep slope or rock face present:
 No Yes (if yes, photograph and complete the following)
 UTM: _____ Location (e.g. aggregate pit, bridge): _____
 Evidence of use by bank or cliff swallows (provide number of nests): _____

Colonial Nesting Ground Breeding Birds, Shorebird Migratory Stopover Areas
 (BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5)
 Shoreline of lake, large river or large wetland present:
 No Yes (if yes, photograph and complete the following)
 UTM: _____ Rocky island or peninsula present: _____
 Mudflat present: _____ Evidence of disturbance (e.g. cattle grazing): _____
 Description of habitat (size of rocky outcrop/mudflat, substrate/soil type, type and abundance of cover): _____

Raptor Winter Feeding and Roosting, Open Country or Shrub/Early Successional Bird Breeding Habitat
 CUT1, CUS1, >30ha, CUM1 >30ha, FOC, FOD, FOM with a CUM, CUT, CUS, CUW > 20ha, or a CUM, CUS, CUT, CUW >15ha
 Large meadow, old field or generally open habitat (e.g. CUM, CUS, CUT, CUS, CUW) present:
 Large open habitat present: No Yes (if yes, photograph and complete the following)
 UTM: _____ Evidence of disturbance (e.g. cattle grazing): _____
 Description of habitat (abundance of food plants for rodents, abundance of perches, height of vegetation): _____

Old-growth or Mature Forests, Interior Forest Breeding Birds
 (FOD, FOC, FOM, SWC, SWM, SWD. Mature forest (>60 years) present)
 Mature forest present: No Yes (if yes, photograph and complete the following)
 UTM: _____ Age of oldest trees: _____
 Evidence of disturbance (e.g. selective cutting): _____
 Description of habitat (structural complexity, abundance of snags and/or downed woody debris, etc): _____

Photo #	Location or Subject	Photo #	Location or Subject

Species of Conservation Concern Habitat and Incidental Wildlife – Goshen



Map No: 227-GSH 1605
 Date (yyyy-mm-dd): 2013-04-16

Field Staff: Tom Skorney
Jess Piette

Time Started: 11:58 am
 Time Finished: 3:10 pm

Observed Species List

Species Code	UTM	EV	Notes	Species Code	UTM	EV	Notes
Am. Robin		Vo					
Red-winged B/l		Vo					
Song Sparrow		Vo					
Flicker		Vo					
White-throated		Ob					
Dark-eyed Junco		Ob					
Black-gaited		Ob					
Killdeer		Ob					
Turkey Vulture		Ob					

Note: Evidence Codes (EV)
Breeding Bird (Possible) SH=Suitable Habitat, SM=Singing Male;
Breeding Bird (Probable) T=Territory, D=Display, P=Pair, N=Nest Building, V= Visiting Nest; A=Anxiety Behavior;
Breeding Bird (Confirmed) DD=Distraction, NU=Used Nest, FY=Fledged Young, NE=Eggs, NY=Young, FS=Foos/Faecal sack, AE=Nest Entry
Other Wildlife Evidence: OB=Observed, VO=Vocalization, CA=Carcass, DP=Distinctive Parts, HO=House/Den, FY=Eggs/young, TK=Tracks, FE=Feeding evidence, SC= Scat, SJ=Other signs (specify)
 N/O → Not observed

ELC	Species	Habitat Description	Habitat Present (Y/N; UTM; description of habitat if present)
PLANTS			
FOD7	American Gromwell (<i>Lithospermum latifolium</i>) - S3 <u>Bloom Time - Spring</u>	Shaded river banks, wooded floodplains. River floodplains, woods and edges of woods.	Y <input checked="" type="radio"/> UTM:
ALO, TPO	Muehlenberg's astomum moss (<i>Astomum muehlenbergianum</i>) - S2 <u>Bloom Time - Spring</u>	Thin soil over level outcrop ledges and on soil under grasses in open prairie	Y <input checked="" type="radio"/> UTM:
FOM1, FOM2, CUP3	Autumn Coral-root (<i>Corallorhiza odontorhiza</i>) - S2 <u>Bloom Time - summer to fall</u>	Oak-pine woods or occasionally in open, red pine or white pine plantations. Dry, sandy woods.	Y <input checked="" type="radio"/> UTM:
FOC, FOM, FOD	Burning Bush (<i>Euonymus atropurpureus</i>) - S3 <u>Bloom Time - April - June</u>	Species occurs in dry to moist deciduous thickets and woods	Y <input checked="" type="radio"/> N UTM: N/O
SWC1, SWC3, SWC4, SWM1, SWM2, SWM4, SWM5, SWM6	Chinese Hemlock Parsley (<i>Conioselinum chinense</i>) - S2 <u>Bloom Time - summer to fall</u>	Swampy places with deciduous trees, white cedars, tamarack; springy river banks, wet borders of streams and rivers. Also found among calcareous seepage slopes.	Y <input checked="" type="radio"/> UTM:
SWC, SWM, SWD, SWT, MAM, MAS	Crowned Beggarticks (<i>Bidens trichosperma</i>) -S2 <u>Bloom Time - late summer</u>	Found in openings in swamps, marshes, along shores & wet fields within the Carolinian zone and southeastern Georgian bay. Bogs, fens, tamarack swamps.	Y <input checked="" type="radio"/> UTM:
ALT1, FOD7	Eastern Green-violet (<i>Hybanthus concolor</i>) - S2 <u>Bloom Time - mid March to August</u>	Occurs in rich, wet-mesic floodplain forests as well as mesic forests over limestone. Includes floodplains and river banks.	Y <input checked="" type="radio"/> UTM:
TPS, TPW, FOM1, FOM2	Fogg's Goosefoot (<i>Chenopodium foggii</i>) -S2	Species occurs in sandy areas on limestone under oak or pine-oak forests	Y <input checked="" type="radio"/> UTM:
TPO2, TPS2, TPW2,	Giant Ironweed (<i>Vermonia gigantean</i>)-S1? <u>Bloom Time-</u>	Found in mesic prairies, thickets, moist woods, roadsides and grassy meadows	Y <input checked="" type="radio"/> UTM:

Species of Conservation Concern Habitat and Incidental Wildlife – Goshen

ELC	Species	Habitat Description	Habitat Present (Y/N; UTM; description of habitat if present)
CUM1, MAM,	June – August		
FOD6, FOD7, FOD8	Green Dragon (Arisaema dracontium) - SC/S3 Bloom Time – May and June	Species found in <u>damp deciduous forest</u> and along river streams. Particularly Maple forest and forest dominated by Red Ash and White Elm.	Y N UTM: N/O
TPO1, TPS1, TPW1, FOM1, FOM2, FOD1, FOD2, FOD3	Hairy Bedstraw (Galium pilosum) -S3 Bloom Time – June-August	Occurs in dry, sandy woods and thickets; occasionally in dry sandy fields	Y N UTM:
FEO1, FES1, FET1, SWC, SWM, SWD, SWT, TPO, TPS, TPW	Hairy Valerian (Vaieriana edulis) -S1 Bloom Time – June to August	Inhabits swampy river flats and meadows, wet prairies, and wooded, rocky riverbanks and fens.	Y N UTM:
FOD6, FOD7, SWM, SWD	Hairy Wood Mint (Blephilia hirsuta) –S1 Bloom Time-Summer	Woodlands, often rocky, especially rivers <u>Rich woods</u> , swamp forests, floodplains.	Y N UTM: N/O
FOD6, FOD7, FOD8, FOD9	Harbinger-of-spring (Erigenia bulbosa) - S3 Bloom Time – early to late April	Occurs in <u>rich, moist deciduous woods</u> , especially on floodplains.	Y N UTM: N/O
SAS1, SAM1, SAF1	Hill's Pond Weed (Potamogeton hillii) - SC/S2 Bloom Time – summer	Aquatic plant found in highly alkaline waters of ditches, ponds, beaver ponds, and slow-moving cold waters.	Y N UTM:
FOM6, FOM7, FOM8	Large Round-leaved Orchid (Platanthera macrophyla) - S2 Bloom Time – June to August	Species inhabits moist mixed woods. Found in fairly mature, upland sugar maple-beech-eastern hemlock woodlands.	Y N UTM:
MAM2, MAM3, MAS2, MAS3, SWD	Lizard's Tail (Saururus cernuus) - S3 Bloom Time – June – September	Species inhabits shores and streambanks along shallow water. As well as swamps, floodplains, shallow water and mudflats at the borders of streams and ponds.	Y N UTM:
FOD8, FOD7, FOD9	Pawpaw (Asimina triloba) –S3 Bloom Time – March-May	Occurs in <u>moist deciduous woods</u> and stream banks.	Y N UTM: N/O
FOM8, FOD8, FOD7, FOD9, CUM1	Pilose Evening Primrose (Oenothera pilosella) –S2 Bloom Time – Late Spring – Early Summer	<u>Moist edges of woods</u> and open, disturbed ground.	Y N UTM: N/O
TPW1, FOM1, FOM2, FOD1, FOD2, FOD3	Prostate Tick-trefoil (Desmodium rotundifolium) –S2 Bloom Time – July-September	Dry, sandy or rocky woods	Y N UTM:
FOD7, SWD	Pumpkin Ash (Fraxinus profunda)-S2? Bloom Time – March - June	Swamps and floodplains	Y N UTM:
CUW1, ALO, FET1, SWC	Ram's-head Lady's-slipper (Cypripedium arietinum) - S3 Bloom Time –mid May to mid June	Found in cedar woodlands, limestone plains and wooded fens, moist coniferous swamps, dry-sandy woods, and limestone barren.	Y N UTM:
FOD1, FOD2, FOD3, FOD4, FOD5, FOC1, FOM1, FOM5	Rattlesnake Hawkweed (Hieracium venosum) - S2 Bloom Time – April – September	Species inhabits open, dry sandy woods. Jack pine, oak, and aspen woodlands.	Y N UTM:
FOD6, FOD7, FOD9	Round-leaved Groundsel (Packera obovata) –S3 Bloom Time-May - June	Found in <u>moist woods</u>	Y N UTM: N/O
CUM1, CUT1, CUS1	Round-leaved hawthorn (Crataegus lumaria) –S3?	Species occurs in old fields, poorly managed pastures, fencelines and roadsides	Y N UTM:
FOD6, FOD7, FOD8, FOD9, SWT2, SWT3	Scarlet Beebalm (Monarda didyma) - S3 Bloom Time – May to October	Found in <u>moist, rich woods</u> , thicket swamps, banks and floodplains.	Y N UTM: N/O
ALO, ALS, ALT, TPO, TPS, TPW	Slender Blazing Star (Liatris cylindracea) –S3	Species occurs in limestone and dolostone pavement, prairies, open woods; alvars and moist sandy meadows.	Y N UTM:
SBO, SBS, SBT, TPO1, TPS1, TPW1, FOD1, FOD2	Slender Knotweed (Polygonum tenue)-S2	Found in dry, sandy, open areas in deciduous (often oak woods), prairie meadows; at edges of sand pits	Y N UTM:
SDT1, FOD5, FOD8	Slim-flowered Muhly (Muhlenbergia tenuiflora) - S2	Found in rich deciduous forest, often on rocky or sandy soils, wooded dunes, hillsides, and riverbanks whether in oak or beech-maple woods	Y N UTM:
BLO1, BLS1, BLT1, TPO2, TPS2, TPW2, MAM2, FOD7	Stiff Gentian (Gentiana quinquefolia) - S2 Bloom Time – late summer to mid fall	Found in moist soils of streambanks, edges of woods, wet prairies, marshy meadows, bluffs and wooded hillsides.	Y N UTM:
TPS1, TPW1, CUW1, RBO, SBO	Sundial Lupine (Lupinus perennis) - S3 Bloom Time – mid-March to mid-June	Inhabits dry, sandy oak savannahs, prairies, open barrens or clearings in woodlands of oak, jack pine, and/or aspen.	Y N UTM:

Species of Conservation Concern Habitat and Incidental Wildlife – Goshen



ELC	Species	Habitat Description	Habitat Present (Y/N; UTM; description of habitat if present)
TPO1, TPS1, TPW1, CUM1	Tall Blazing Star (<i>Liatris aspera</i>)-S3/SC	Occurs in open, sandy woods, dry roadsides and sandy prairies	Y <input checked="" type="radio"/> UTM:
FEO, FES, FET, MAM2, MAM3	Tuberous Indian Plantain (<i>Arnoglossum plantagineum</i>) - S3 Bloom Time –mid-March to mid-June	Occurs mainly in flat, sandy areas of the Bruce Peninsula. Fens, wet meadows, and calcareous river flats.	Y <input checked="" type="radio"/> UTM:
FOC1, FOC2, FOC3, FOC4	Woodland Pinedrops (<i>Pterospira andromedea</i>) - S2 Bloom Time – summer	Found in conifer woods, under pines, but also hemlock, spruce, fir, and white cedar. In dry or rocky soil, often with common juniper and sometimes aspen or birch.	Y <input checked="" type="radio"/> UTM:
CUM1, CUT1, CUW1, RBO1, SBO1	Yellow Ladies'-tresses (<i>Spiranthes ochroleuca</i>) - S2 Bloom Time – August to November	Dry, open sites, usually on acidic sandy soil, dry to mesic open woodland, thickets, meadows, barrens, ledges, outcrops, banks and roadsides, old fields.	Y <input checked="" type="radio"/> UTM:
BIRDS			
-	Bald Eagle (<i>Haliaeetus leucocephalus</i>) - SC	Assessed as SWH. Record species if found.	not required.
CUW, SDO, RBO, TPS	Common Nighthawk (<i>Chordeiles minor</i>) - SC	Hunts insects over a wide variety of habitats, in particular <u>open or semi-open areas</u> . Nests on ground in a wide range of <u>open, sparse or vegetation-free habitats</u> .	Y <input checked="" type="radio"/> UTM:
FOD, FOM	Louisiana Waterthrush (<i>Seiurus motacilla</i>) - SC	Inhabits <u>mature forests</u> along steeply sloped ravines adjacent to running water. Trees, bushes, exposed roots, cliffs, banks and mossy logs are favoured nesting spots. <u>Riparian woodlands</u> are preferred stopover sites during migration	Y <input checked="" type="radio"/> UTM:
FOD, CUW, CUT	Red-headed Woodpecker (<i>Meianerpes erythrocephalus</i>) - SC	Species inhabits open woodland/ edges (oak savannahs and riparian forest), 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; requires cavity trees with at least 40 cm dbh; requires about 4 ha for a territory.	Y <input checked="" type="radio"/> UTM:
-	Short Eared Owl (<i>Asio flammeus</i>) - SC	Assessed as SWH. Record species if found.	not required.
CUT1	Yellow-breasted Chat (<i>Icteria virens</i>) - SC	Inhabits thickets, tall tangles of shrubbery beside streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines	Y <input checked="" type="radio"/> UTM:
REPTILES			
-	Eastern Ribbonsnake (<i>Thamnophis sauritus</i>) - SC	Assessed as SWH. Record species if found.	not required.
-	Milksnake (<i>Lampropeltis triangulum</i>) -SC	Assessed as SWH. Record species if found.	not required.
-	Snapping Turtle (<i>Chelydra serpentina</i>) - SC	Assessed as SWH. Record species if found.	not required.
INSECTS			
OAO, SA, SWM, SWD	Azure Bluet (<i>Enallagma aspersum</i>) –S3	Species inhabits fishless ponds, lakes and boggy swamps	Y <input checked="" type="radio"/> UTM:
TPS, TPW	Sleepy Duskywing (<i>Erynnis brizo</i>) - S1	Occurs in oak/oak-pine scrub, chaparral, barrens, well-drained sandy or shaly soils. Species regularly seen at flowers in oak woods, on the ground, and at mud puddles	Y <input checked="" type="radio"/> UTM:
CUM1, CUT1, CUW1	Monarch Butterfly (<i>Danaus plexippus</i>) - SC	Their larvae only feed on milkweeds (<i>Asclepius</i> spp.). Habitat includes abandoned farmland, along roadsides, open spaces where these plants grow	Y <input checked="" type="radio"/> UTM:
TPS, CUW	Mottled Duskywing (<i>Erynnis martialis</i>) –S2	Usually seen nectaring or on wet sandy roads. Larvae feeds on New Jersey Tea and adults only likely near where this plant is present	Y <input checked="" type="radio"/> UTM:
SWT, SWD, SWM, FOM, FOD4-3, TPW, TPS, CUM1	Tawny Emperor (<i>Asterocampa clyton</i>) – S3	Species inhabits densely wooded riparian areas, dry woods, open woods, fencerows and parks. Usually occurs near Hackberry, the larval foodplant	Y <input checked="" type="radio"/> UTM:
FOD5	West Virginia White (<i>Pieris virginiana</i>) - SC	This species is restricted to rich, moist, deciduous woods, where its foodplant Toothwort occur	Y <input checked="" type="radio"/> UTM:

**Appendix B2. Amphibian Woodland
Breeding Habitat
Evaluation of
Significance Surveys**

ASA



Study Area: GST1-1606
 Pre-determined Station #: VP #4 *Feature #: 255-GST11606
 GPS: 17T 0443256, 479 2587

Date(yyyy-mm-dd): 2012-05-09 Field Staff (full name): RA, SG
 Weather: sunny, 50% cloud cover, light breeze 12°C
 Time Started: 8:15am Time Finished: 10:00am

Water Present (Y/N) (Y) Vernal Pool or Pond? (P)
 Maximum Water Depth (m) 1m Water Quality (visual) good.
 Length(m) 40-50 Width(m) 30
 % open water (emergent) — % floating plant cover of open water —
 Potential to hold water until July (Y/N) (Y) if yes then complete amphibian and salamander sheet
 Human Influences affecting area (dykes, agriculture etc.) road.
 Describe area 100m behind you (field, marsh etc) road x2, open wheat field, forest

Submergent Plants (Species & % cover **)	
1	3
2	4
Emergent Plants (Species & % cover)	
1	3
2	4
Floating Plants (Species and % cover)	
1	3
2	4
Fringing Shrubs (Species & % cover)	
1 <u>Typha latifolia 10%</u>	3
2 <u>Carex sp. 10%</u>	4
Trees (Species & % cover)	
1 <u>Pinus sylvestris 10%</u>	3
2 <u>populus tremula 10%</u>	4
Exposed mud/sand/rock	<u>5%</u>

Logs (size, quantity, location) none

Amphibians/egg masses observed (Type, quantity, location) none - ASA

Comments open water pond - very few fringing shrubs or trees.

* - FEATURE # refers to the vernal pool ID that you will be giving. This # will be used on call sheet

** - Of total percent cover (surface and canopy), select top 4 and estimate percent of their cover.

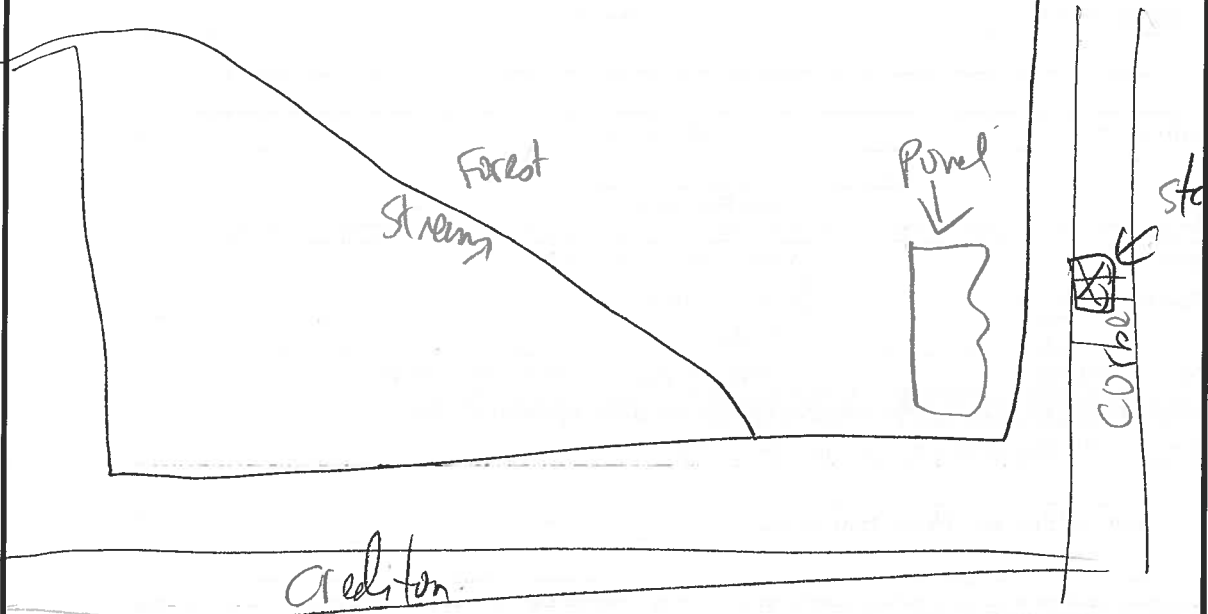
If no water present then no amphibian or salamander sheet completed

Pools created by tractor/ATV etc. ruts that are not naturalized are not considered vernal pool habitat

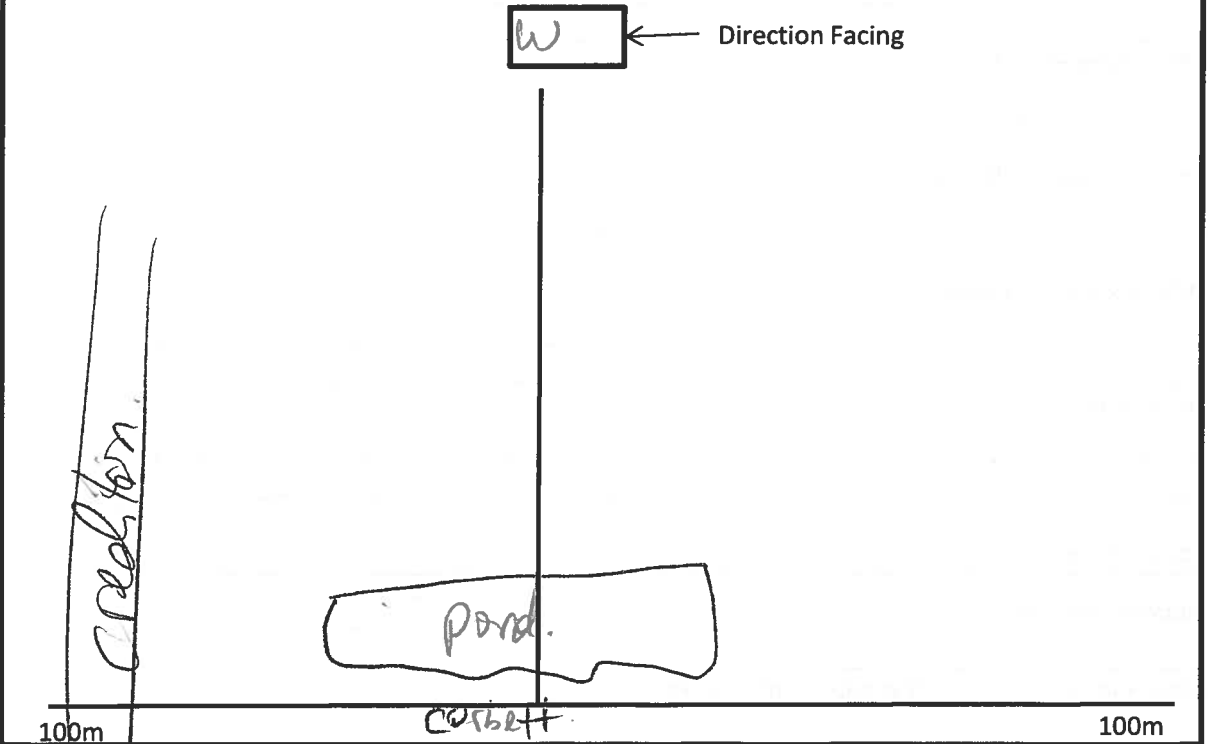
~~Thurs 1:30pm~~



Map of general location - station location, road names, north arrow, entry route, house #, etc.

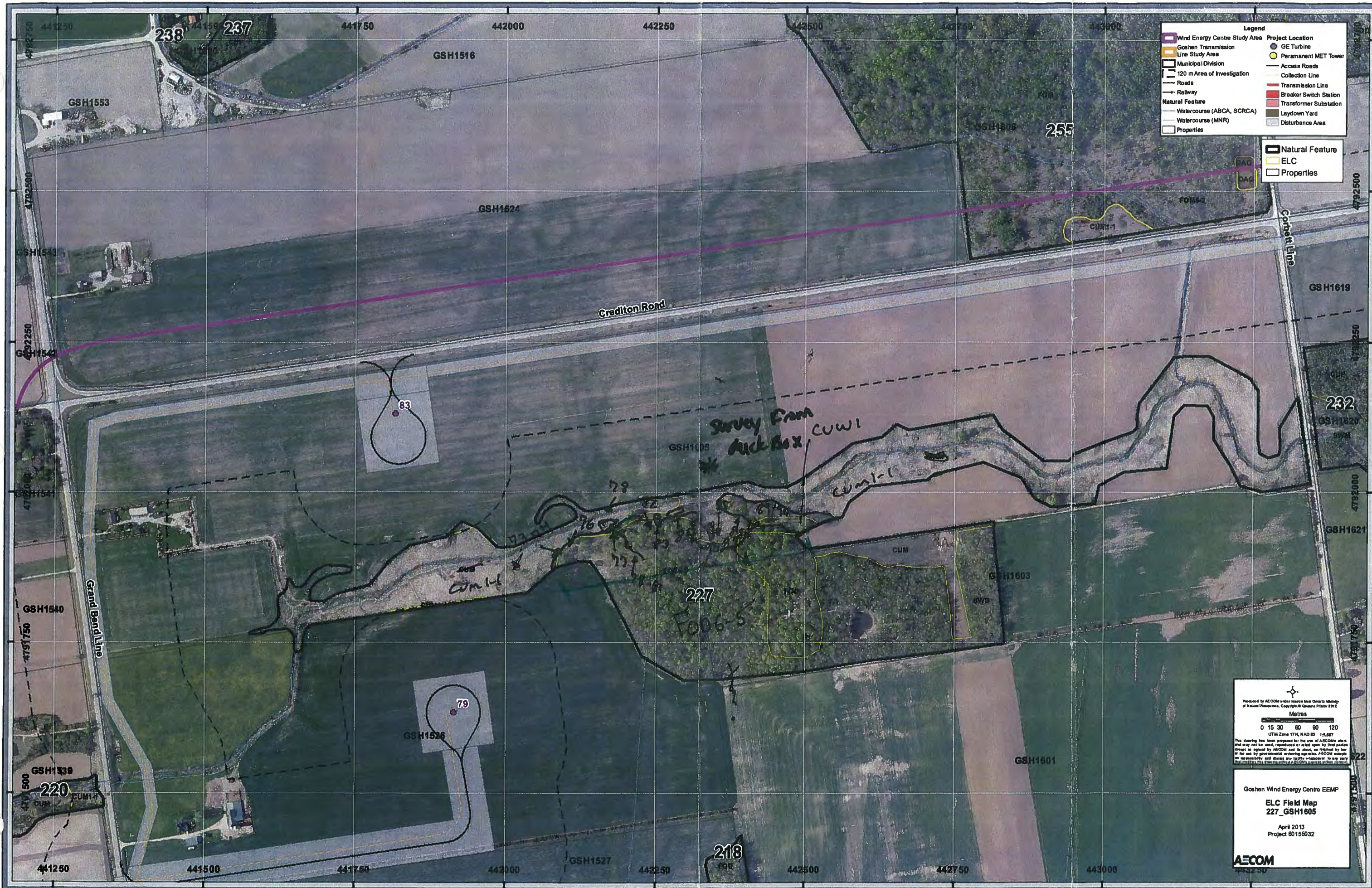


Map of Feature - GPS location, flow (if any), location of species (if any), vegetation, etc.



Photo#(locate on map and GPS if necessary)

743 - pond



Legend

Wind Energy Centre Study Area	GE Turbine
Goshen Transmission Line Study Area	Permanent MET Tower
Municipal Division	Access Roads
120 m Area of Investigation	Collection Line
Roads	Transmission Line
Railway	Breaker Switch Station
Natural Feature	Transformer Substation
Watercourse (ABCA, SCRCA)	Laydown Yard
Watercourse (MNR)	Disturbance Area
Properties	

Natural Feature
ELC
Properties

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Meters

0 15 30 60 90 120

UTM Zone 17N, NAD 83 15,087

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Goshen Wind Energy Centre EEMP

ELC Field Map

227_GSH1605

April 2013

Project 60155032

AECOM

Vernal Pool/Pond Habitat Description and Feature Identification Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: VPI Feature # 1: 227 GSH1605
 UTM's: 442147 4791928

Date (yyyy-mm-dd): 2013-04-16
 Field Staff (full name): Jess Piotti + Tom Shorney
 Weather Conditions: 13°C overcast
 Time Started: 12:27pm Time Finished:

Water Present (Y/N) Yes Vernal Pool or Pond? vernal pool
 Max Water Depth (m) avg. 30cm Water Quality (visual) clear
 Length(m) avg. 5-20m Width(m) avg. 5-10m
 % open water (emergent) 96% % floating plant cover of open water none

Potential to hold water until July? (circle one) YES NO
 Human Influences affecting area (dykes, agriculture etc.): park right next to it + agricultural m. on other side of watercourse
 Describe area 100m behind you (field, marsh etc): field

Submergent Plants (Species & % cover **) 0%	
1	3
2	4
Emergent Plants (Species & % cover) 2%	
1 <u>iris sp.</u>	3
2 <u>phalaris can.</u>	4
Floating Plants (Species and % cover) 0%	
1	3
2	4
Fringing Shrubs (Species & % cover) 0%	
1	3
2	4
Trees (Species & % cover) 2%	
1 <u>Pileate</u>	3 <u>Ulmamar</u>
2 <u>Frupear</u>	4
Exposed mud/sand/rock	

Logs (size, quantity, location) no logs but there are trees within pools

Amphibians/egg masses observed (Type, quantity, location) none

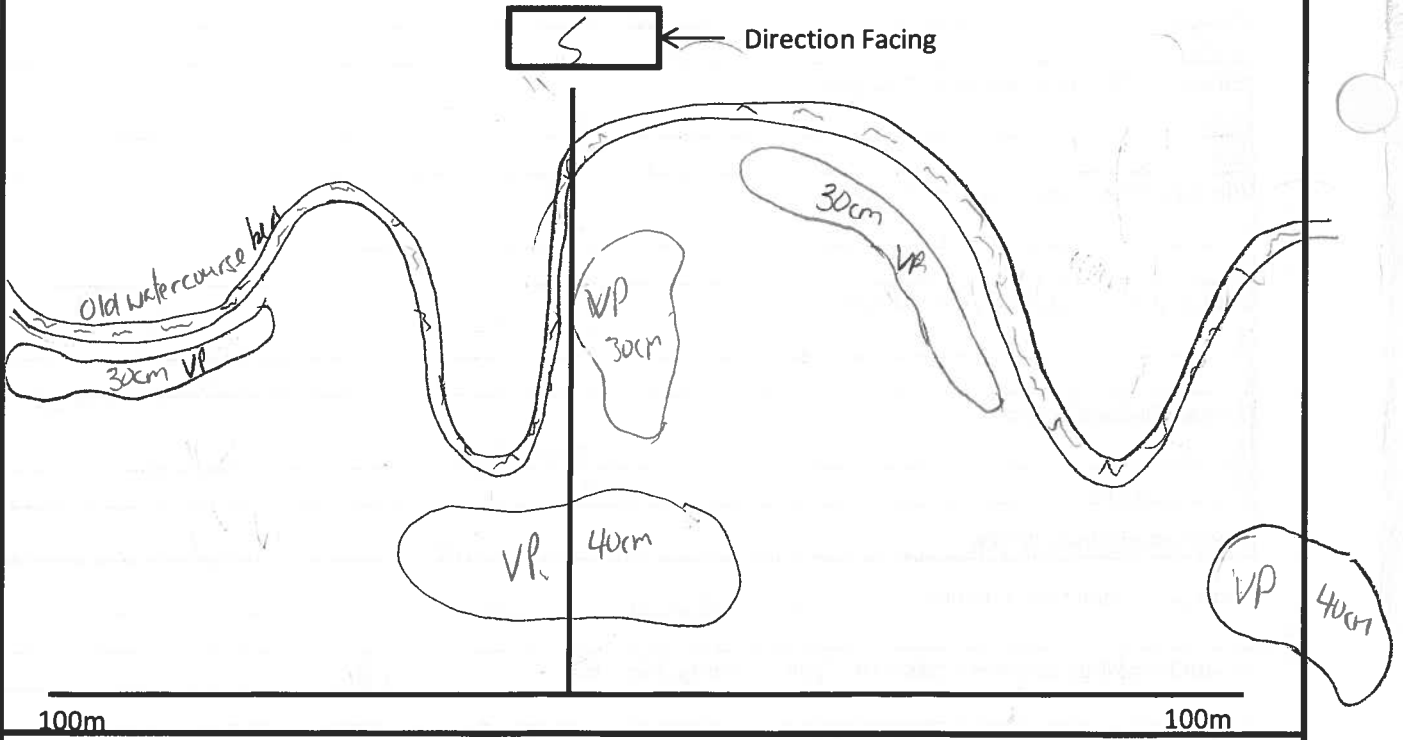
Comments area had several ponds

* Feature # refers to assigned AWO/ AWE EOS ID. This # will be used on call sheet & salamander forms
 ** Of total percent cover (surface and canopy), select top 4 and estimate percent of their cover.
 If no water present then no amphibian or salamander sheet completed
 Pools created by tractor/ATV etc. ruts that are not naturalized are not considered vernal pool habitat

Map of general location - station location, road names, north arrow, entry route, house #, etc.



Map of Feature - GPS location, flow (if any), location of species (if any), vegetation, etc.



Photo#(locate on map and GPS if necessary)

→ 5 pools within same area all can be surveyed from same location

Salamander Area Search Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: 227 VPI Feature #¹: 227
 UTM's: 17T442147, 4791928

Date(yyyy-mm-dd): 2013-04-16
 Field Staff (full name): Tom Shuman, Jess Piette
 Weather Conditions: Sunny w/ cloudy periods, 8°C, light breeze
 Time Started: 11:58 am Time Finished: 3:10 p.m.

Water Present Y/N) Yes Vernal pool depth (m) 30cm Ave
 Vernal Pool width (m) 5-10m Avg Vernal Pool length (m) 5-20m Ave

Vegetation Comments:
 (Dominant, % cover etc) Fragaria, Tilia, Ulm, etc → 10-20% overall canopy cover.

NO Amphibians Observed

Amphibian Species	Life Stage ²	Number ³	Search Type ⁴	Size ⁵	Comments/GPS

Photo #	Location/or Subject	Photo #	Location/or Subject

Comments (ex: egg masses to have GPS)
Pools an average of all 5 Pools observed

¹ Feature # refers to the vernal pool ID given on the habitat description form
² Adult or larvae or egg masses
³ Number of individuals (adults or larvae) or egg masses
⁴ Overturned logs, D-ring dipnet, observation
⁵ Size of individual (adult or larvae) or egg masses (cm)

Amphibian Night Time Call Survey Form

AECOM

Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: VPI *Feature #: GSH 227-1605
 UTMs: 442647 479 2114
 Water Present (Y/N) yes

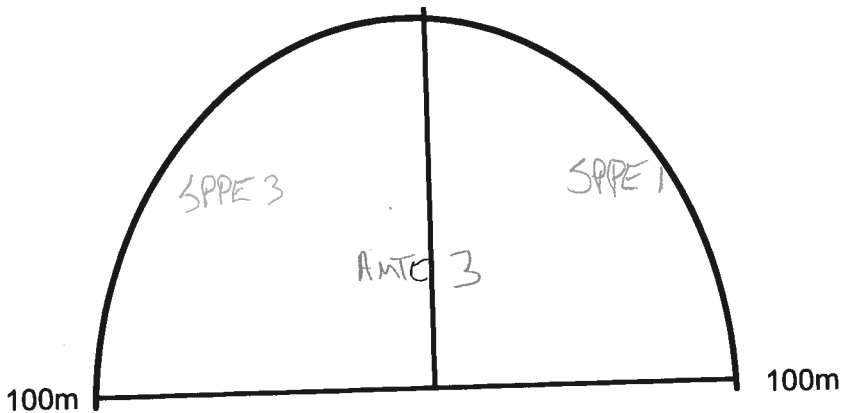
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd): 2013-04-30 Visit #(1-3): 1
 Field Staff (full names): Tom Stoney + Justin Murfroe
 Time Started: 11:25 P.m Time Finished: 11:28 P.m

Beaufort Wind Scale (0-6): 2 Cloud Cover (%): 20%
 Background Noise Scale (0-4): 1 Temperature Celcius 16°C
 Precipitation (None, fog, drizzle, or rain) None

S ← Direction Facing

Species	IN	OUT
NONE		
AMTO	X	
BULL		
CHFR		
MIFR		
GRTR		
GRFR		
NLFR		
PIFR		
SPPE	X	
WOFR		



Code 1 - not simultaneous, number of individuals can be accurately counted
Code 2 - some call simultaneous, but number of individuals can be reliably estimated
Code 3 - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort	0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale	1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
	2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
	3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background	0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale	1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
	2 - moderate - distant traffic (2-5 cars)	

Species	AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes	BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
	CHFR - Chorus Frog	NLFR - N. Leopard Frog	
	MIFR - Mink Frog	PIFR - Pickerel Frog	

General Comments: Abundance of Amphibian Calling



Legend

Wind Energy Centre Study Area	Project Location
Goshen Transmission Line Study Area	GE Turbine
Municipal Division	Permanent MET Tower
120 m Area of Investigation	Access Roads
Roads	Collection Line
Railway	Transmission Line
Natural Feature	Breaker Switch Station
Watercourse (ABCA, SCRCA)	Transformer Substation
Watercourse (MNR)	Laydown Yard
Properties	Disturbance Area

Natural Feature
ELC
Properties

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Meters

0 15 30 60 90 120

UTM Zone 17N, NAD 83, 12S, 87

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Goshen Wind Energy Centre EEMP

ELC Field Map

227_GSH1605

April 2013

Project 60166032

AECOM

Salamander Area Search Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: 227 GSH/605 Feature #: 227 GSH/605
 UTM: +5m → 442143 4791933

Date (yyyy-mm-dd): 2013-05-13
 Field Staff (full name): Jess Pello + Tom Shoney
 Weather Conditions: _____
 Time Started: 5:15 PM Time Finished: _____

Water Present Y/N: YES (VPI) Vernal pool depth (m): 20cm
 Vernal Pool width (m): 2m Vernal Pool length (m): 5m

Vegetation Comments: see round 1 notes
 (Dominant, % cover etc) _____

NO Amphibians Observed

Amphibian Species	Life Stage ²	Number ³	Search Type ⁴	Size ⁵	Comments/GPS

Photo #	Location/or Subject	Photo #	Location/or Subject
<u>29</u>	<u>VPI with water</u>		
<u>30-34</u>	<u>dry ponds</u>		

Comments (ex: egg masses to have GPS)
→ Only first one had water remaining all others were dry
closest to memorial park area

¹ Feature # refers to the vernal pool ID given on the habitat description form
² Adult or larvae or egg masses
³ Number of individuals (adults or larvae) or egg masses
⁴ Overturned logs, D-ring dipnet, observation
⁵ Size of individual (adult or larvae) or egg masses (cm)

Amphibian Night Time Call Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: 229-GSH1605 *Feature #: _____
 UTMs: See Round #1 notes
 Water Present (Y/N) yes

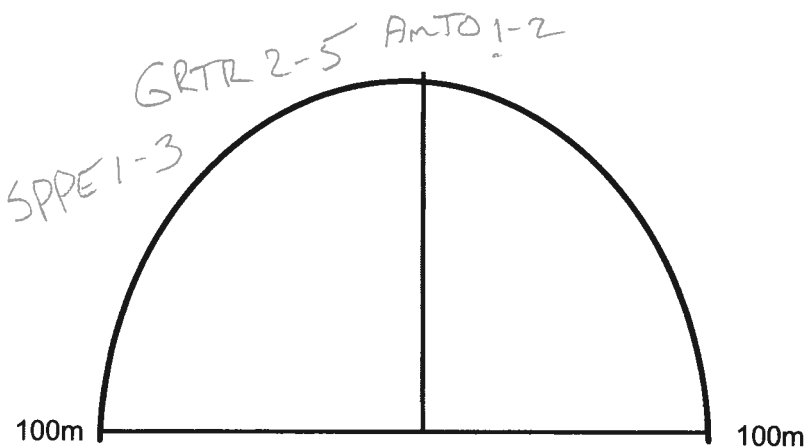
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd): 2013-05-30 Visit #(1-3): 2
 Field Staff (full names): Tom Sharkey Angus Keir
 Time Started: 10:22 P.M. Time Finished: 10:25 P.M.

Beaufort Wind Scale (0-6): 2 Cloud Cover (%): 80%
 Background Noise Scale (0-4): 2 Temperature Celcius: 23°C
 Precipitation (None, fog, drizzle, or rain) None

Species	IN	OUT
NONE		
AMTO		X
BULL		
CHFR		
MIFR		
GRTR		X
GRFR		
NLFR		
PIFR		
SPPE		X
WOFR		

S ← Direction Facing



- Code 1 - not simultaneous, number of individuals can be accurately counted
- Code 2 - some call simultaneous, but number of individuals can be reliably estimated
- Code 3 - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort 0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale 1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background 0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale 1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
2 - moderate - distant traffic (2-5 cars)	

Species AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
CHFR - Chorus Frog	NLFR - N. Leopard Frog	
MIFR - Mink Frog	PIFR - Pickerel Frog	

General Comments: _____

Amphibian Night Time Call Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: 7 *Feature #: 227
 UTMs: _____
 Water Present (Y/N) Y

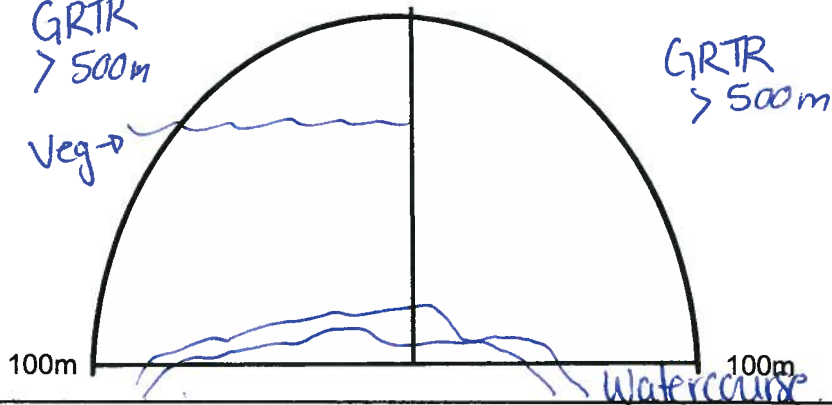
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd): 2013-06-19 Visit #(1-3): 3
 Field Staff (full names): Jill deMan + Rayna Carmichael
 Time Started: 11:07 Time Finished: 11:10

Beaufort Wind Scale (0-6): 0 Cloud Cover (%): 0%
 Background Noise Scale (0-4): 1 Temperature Celcius: 11 deg.
 Precipitation (None, fog, drizzle, or rain) None

Species	IN	OUT
NONE	X	X
AMTO		
BULL		
CHFR		
MIFR		
GRTR		X
GRFR		
NLFR		
PIFR		
SPPE		
WOFR		

S ← Direction Facing



Code 1 - not simultaneous, number of individuals can be accurately counted
 Code 2 - some call simultaneous, but number of individuals can be reliably estimated
 Code 3 - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort	0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale	1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
	2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
	3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background	0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale	1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
	2 - moderate - distant traffic (2-5 cars)	

Species	AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes	BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
	CHFR - Chorus Frog	NLFR - N. Leopard Frog	
	MIFR - Mink Frog	PIFR - Pickeral Frog	

General Comments: Moon was very bright / Very still



Legend

Wind Energy Centre Study Area	Project Location
Goshen Transmission Line Study Area	GE Turbine
Municipal Division	Permanent MET Tower
120 m Area of Investigation	Access Roads
Roads	Collection Line
Railway	Transmission Line
Natural Feature	Breaker Switch Station
Watercourse (ABCA, SCRCA)	Transformer Substation
Watercourse (MNR)	Laydown Yard
Properties	Disturbance Area

Natural Feature
ELC
Properties

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Metres

0 5 10 20 30 40

UTM Zone 17N, NAD 83 1:2,882

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Goshen Wind Energy Centre EEMP

ELC Field Map

258_GSH1618

April 2013

Project 60156032



Vernal Pool/Pond Habitat Description and Feature Identification Form



Study Area (circle one): Bluewater (Goshen) Jericho
 Pre-determined Station #: _____ Feature #¹: 258 GSH1618
 UTM: 443935, 4792873

Date (yyyy-mm-dd): 2013-04-24
 Field Staff (full name): Tom Storrey + Rob Aitken
 Weather Conditions: Snow, 3°C, 20km/h wind
 Time Started: 2:30 P.m. Time Finished: 3:00 P.m.

Water Present (Y/N) yes Vernal Pool or Pond? Vernal Pool
 Max Water Depth (m) 20cm Water Quality (visual) clear
 Length(m) 30m Width(m) 15m
 % open water (emergent) 90% % floating plant cover of open water 0%

Potential to hold water until July? (circle one) YES NO
 Human Influences affecting area (dykes, agriculture etc.): Agricultural land surrounding woodlot
 Describe area 100m behind you (field, marsh etc): Agricultural field

Submergent Plants (Species & % cover **)	
1	3
2	4
Emergent Plants (Species & % cover)	
1 <u>Carex sp 5%</u>	3
2	4
Floating Plants (Species and % cover)	
1	3
2	4
Fringing Shrubs (Species & % cover)	
1 <u>Cornus sp 15%</u>	3
2 <u>Fra Penn 30%</u>	4
Trees (Species & % cover)	
1 <u>Fra Penn 80%</u>	3 <u>Acer xFree 10%</u>
2 <u>Ulm Amer 10%</u>	4
Exposed mud/sand/rock	

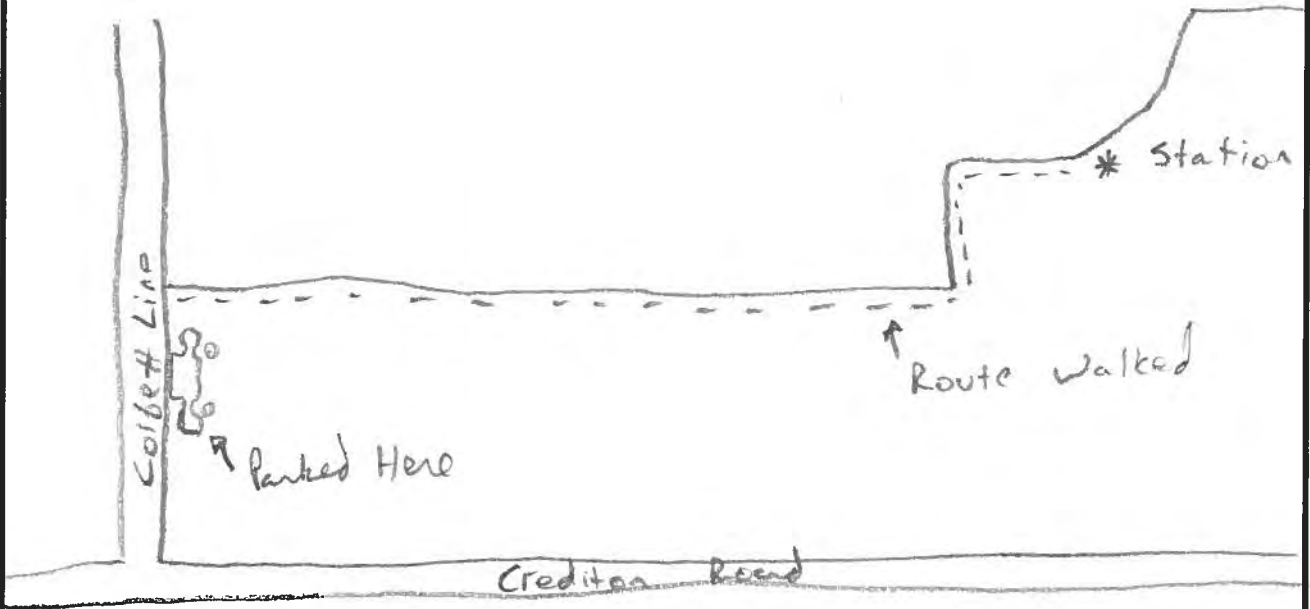
Logs (size, quantity, location) Some downed woody debris - Generally small in size.

Amphibians/egg masses observed (Type, quantity, location) No egg masses or Adults observed

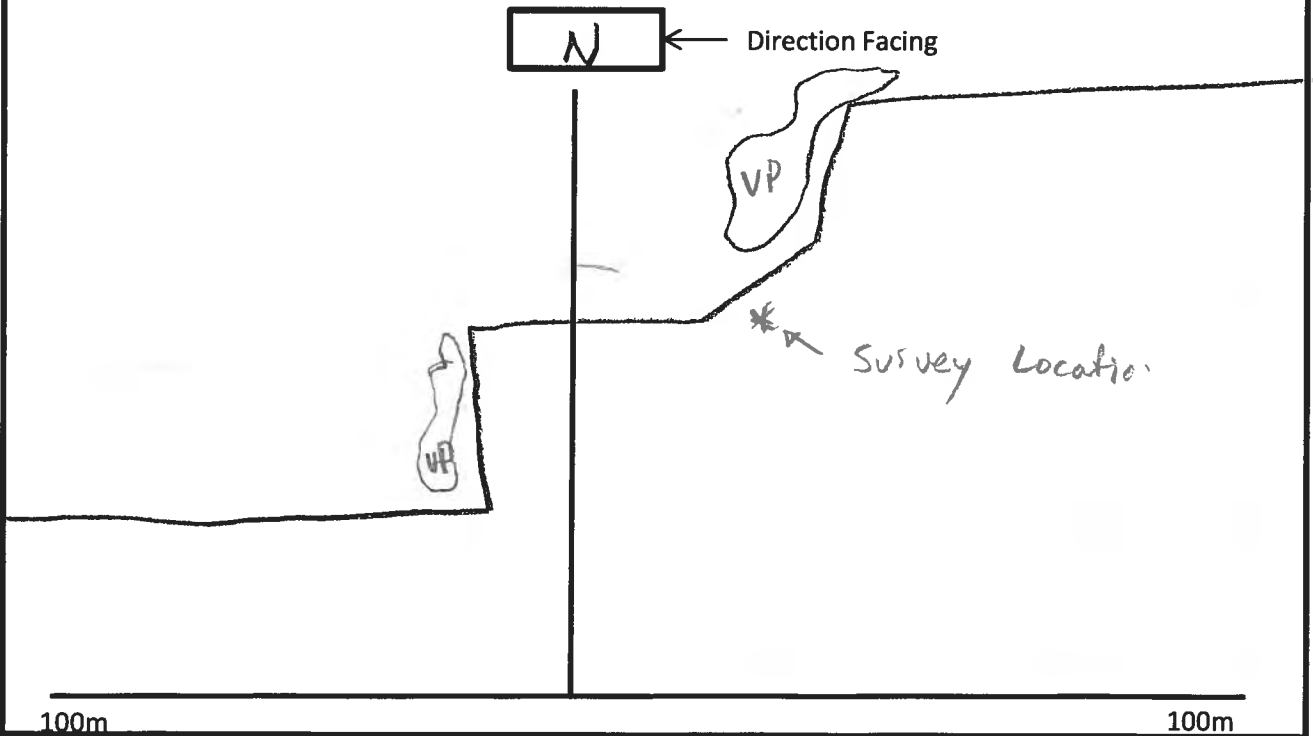
Comments Large wetland, running water in some locations

* Feature # refers to assigned AWO/ AWE EOS ID. This # will be used on call sheet & salamander forms
 ** Of total percent cover (surface and canopy), select top 4 and estimate percent of their cover.
 If no water present then no amphibian or salamander sheet completed
 Pools created by tractor/ATV etc. ruts that are not naturalized are not considered vernal pool habitat

Map of general location - station location, road names, north arrow, entry route, house #, etc.



Map of Feature - GPS location, flow (if any), location of species (if any), vegetation, etc.



Photo#(locate on map and GPS if necessary)

Salamander Area Search Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: _____ Feature #¹: 258 GSH1618
 UTM: 443935, 4792873

Date(yyyy-mm-dd): 2013-04-24
 Field Staff (full name): Tom Shorney + Rob Aitken
 Weather Conditions: Snow, 3°C, 20km/h Wind
 Time Started: 2:30 P.m. Time Finished: 3:00 P.m.

Water Present Y/N) Yes Vernal pool depth (m) 20cm
 Vernal Pool width (m) 15m Vernal Pool length (m) 30m

Vegetation Comments: Green Ash Deciduous Swamp (SWD 2-2)
 (Dominant, % cover etc) Frag. 80%, U/m Amer 10%, Acer x Free 10%

NO Amphibians Observed No

Amphibian Species	Life Stage ²	Number ³	Search Type ⁴	Size ⁵	Comments/GPS

Photo #	Location/or Subject	Photo #	Location/or Subject

Comments (ex: egg masses to have GPS)
- No egg masses observed within Pond

¹ Feature # refers to the vernal pool ID given on the habitat description form
² Adult or larvae or egg masses
³ Number of individuals (adults or larvae) or egg masses
⁴ Overturned logs, D-ring dipnet, observation
⁵ Size of individual (adult or larvae) or egg masses (cm)

Amphibian Night Time Call Survey Form



Study Area (circle one):	Bluewater	<u>Goshen</u>	Jericho
Pre-determined Station #:	<u>258-GSH 1618</u>		*Feature #: <u>258-GSH 1618</u>
UTMs:	<u>493909</u>	<u>492864</u>	
Water Present (Y/N)	<u>YES</u>		

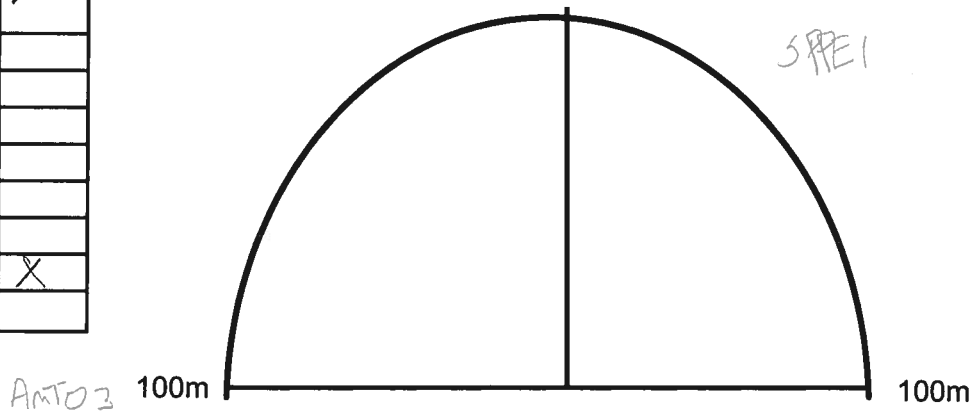
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd):	<u>2013-04-30</u>	Visit #(1-3):	<u>1</u>
Field Staff (full names):	<u>TOM SLOREY ; JUSTIN MURPHY</u>		
Time Started:	<u>11:50 P.M.</u>	Time Finished:	<u>11:53 P.M.</u>

Beaufort Wind Scale (0-6):	<u>2</u>	Cloud Cover (%):	<u>10%</u>
Background Noise Scale (0-4):	<u>1</u>	Temperature Celcius	<u>16°C</u>
Precipitation (None, fog, drizzle, or rain)	<u>None</u>		

Species	IN	OUT
NONE		
AMTO		X
BULL		
CHFR		
MIFR		
GRTR		
GRFR		
NLFR		
PIFR		
SPPE		X
WOFR		

NW

 ← Direction Facing


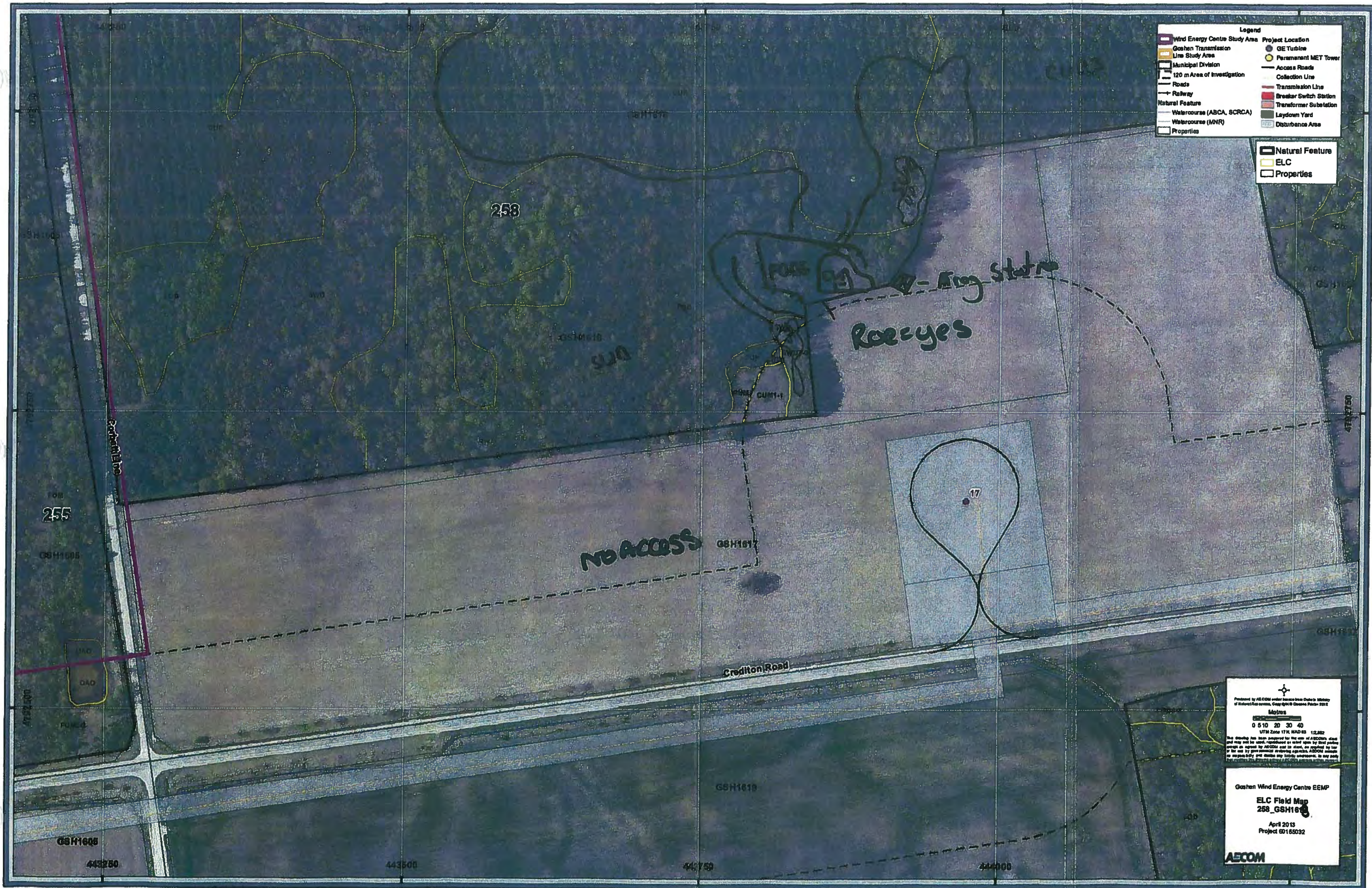
- Code 1** - not simultaneous, number of individuals can be accurately counted
- Code 2** - some call simultaneous, but number of individuals can be reliably estimated
- Code 3** - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort	0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale	1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
	2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
	3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background	0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale	1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
	2 - moderate - distant traffic (2-5 cars)	

Species	AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes	BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
	CHFR - Chorus Frog	NLFR - N. Leopard Frog	
	MIFR - Mink Frog	PIFR - Pickeral Frog	

General Comments: _____



Legend

Wind Energy Centre Study Area	Project Location
Goshen Transmission Line Study Area	GE Turbine
Municipal Division	Permanent MET Tower
120 m Area of Investigation	Access Roads
Roads	Collection Line
Railway	Transmission Line
Natural Feature	Breaker Switch Station
Watercourse (ABCA, SCRCA)	Transformer Substation
Watercourse (MNR)	Laydown Yard
Properties	Disturbance Area

Natural Feature
ELC
Properties

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Meters

0 5 10 20 30 40

UTM Zone 17N, NAD 83, 12,882

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Goshen Wind Energy Centre EEMP
ELC Field Map
 258_GSH1619
 April 2013
 Project 60165032

AECOM

Amphibian Night Time Call Survey Form



Study Area (circle one):	Bluewater	Goshen	Jericho
Pre-determined Station #:	258	*Feature #:	
UTMs:	See Round #1 Notes		
Water Present (Y/N)	YES		

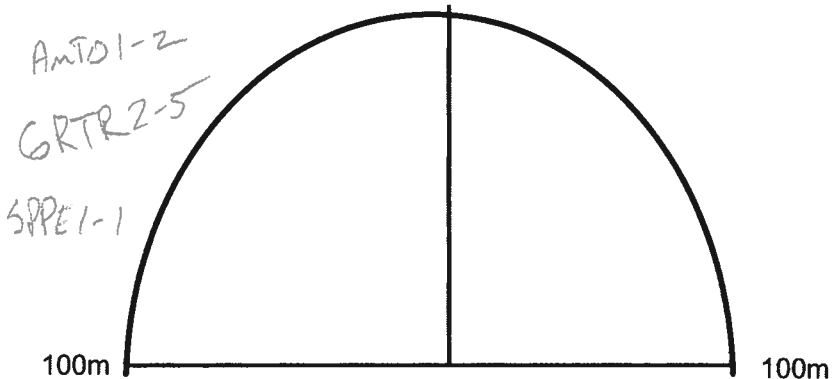
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd):	2013-05-30	Visit #(1-3):	2
Field Staff (full names):	Tom Shorrey	Arqus Keris	
Time Started:	10:51 P.M.	Time Finished:	10:54 P.M.

Beaufort Wind Scale (0-6):	2	Cloud Cover (%):	60%
Background Noise Scale (0-4):	2	Temperature Celcius	23°C
Precipitation (None, fog, drizzle, or rain)	None		

Species	IN	OUT
NONE		
AMTO		X
BULL		
CHFR		
MIFR		
GRTR		X
GRFR		
NLFR		
PIFR		
SPPE		X
WOFR		

NW ← Direction Facing



- Code 1 - not simultaneous, number of individuals can be accurately counted
- Code 2 - some call simultaneous, but number of individuals can be reliably estimated
- Code 3 - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort	0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale	1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
	2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
	3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background	0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale	1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
	2 - moderate - distant traffic (2-5 cars)	

Species	AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes	BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
	CHFR - Chorus Frog	NLFR - N. Leopard Frog	
	MIFR - Mink Frog	PIFR - Pickerel Frog	

General Comments:

Amphibian Night Time Call Survey Form



Study Area (circle one): Bluewater Goshen Jericho
 Pre-determined Station #: GSH 1618 Feature #: 258
 UTMs: _____
 Water Present (Y/N) Y

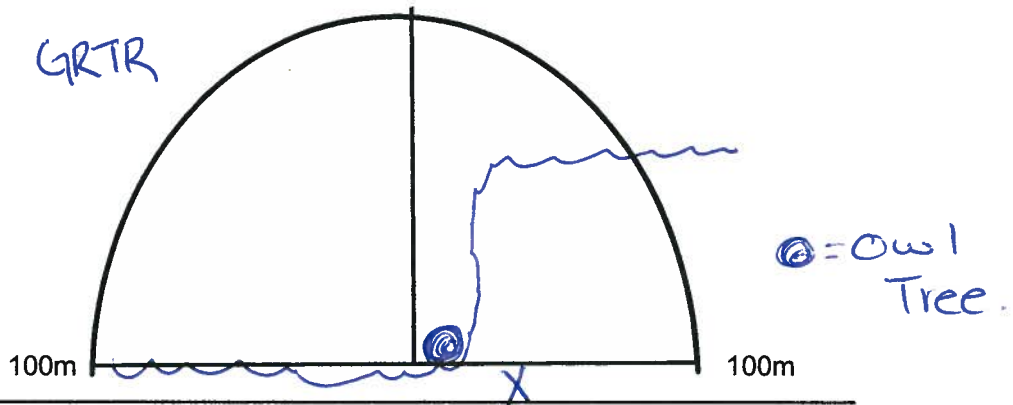
* Feature # refers to the vernal pool ID given on the habitat description form

Date (yyyy-mm-dd): 2013-06-19 Visit #(1-3): 3
 Field Staff (full names): Jill deMan + Rayna Carmichael
 Time Started: 11:33 Time Finished: 11:36

Beaufort Wind Scale (0-6): 0 Cloud Cover (%): 0%
 Background Noise Scale (0-4): 0 Temperature Celcius: 11deg.
 Precipitation (None, fog, drizzle, or rain) None

Species	IN	OUT
NONE	X	
AMTO		
BULL		
CHFR		
MIFR		
GRTR		
GRFR		
NLFR		
PIFR		
SPPE		
WOFR		

NW ← Direction Facing



Code 1 - not simultaneous, number of individuals can be accurately counted
 Code 2 - some call simultaneous, but number of individuals can be reliably estimated
 Code 3 - full chorus, call continuous, numbers of individuals cannot be reliably estimated

Beaufort	0: 0-2 km/hr - calm	4: 20-30 km/hr - moderate breeze - small branch moves
Wind Scale	1: 3-5 km/hr - light air movement	5: 31-38 km/hr - fresh breeze - moderate branch moves
	2: 6-11 km/hr - slight breeze - can feel on face	6: 39-49 km/hr - strong breeze - large branch moves
	3: 12-19 km/hr - gentle breeze - leaves move on twigs	

Background	0 - no appreciable effect	3 - serious - continuous traffic nearby (6-10 cars)
Noise Scale	1 - slight - distant traffic (1 car)	4 - profound - continuous traffic passing
	2 - moderate - distant traffic (2-5 cars)	

Species	AMTO - American Toad	GRTR - Gray Treefrog	SPPE - Spring Peeper
Codes	BULL - Bullfrog	GRFR - Green Frog	WOFR - Wood Frog
	CHFR - Chorus Frog	NLFR - N. Leopard Frog	
	MIFR - Mink Frog	PIFR - Pickeral Frog	

General Comments: Owl!! - will ID based on recording.
Flying around us / stopped calling once we left.

**Appendix B3. Turtle Wintering
Area Evaluation of
Significance Surveys**

04/09/13

↑
Dashwood
Line

Did
Not use
VP
Pic 1

GSH1012
Roe=yes

Survey
Point 1

Survey
Point 2

TOW-01

T34

Legend

Wind Energy Centre Study Area	Project Location
Goshen Transmission Line Study Area	GE Turbine
Municipal Division	Permanent MET Tower
120 m Area of Investigation	Access Roads
Roads	Collection Line
Railway	Transmission Line
Natural Feature	Breaker Switch Station
Watercourse (ABCA, SCRCA)	Transformer Substation
Watercourse (MNR)	Laydown Yard
	Disturbance Area

Turtle Wintering Areas

- ▲ Significant Wildlife Habitat

Property Access

- Denied
- Granted
- Location of Point Count

Transect/point count/point locations and/or property access status may be subject to change and will be confirmed at the time of field surveys (e.g. depending on site conditions and/or landowner consultation)

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Metres

0 3.25 6.5 13 19.5 26

UTM Zone 17N, NAD 83 1:1,000

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Goshen Wind Energy Centre

Significant Wildlife Habitat

Field Map - TOW-01

March 2013

Project 60155032

AECOM

Turtle Wintering Area Survey Form

Study Area: <u>Goshen</u>	Observers: <u>Tom Shorrey + Jess Piette</u>
Feature ID: <u>TWO-01</u>	

Fill in survey form for each vantage point. Vantage Point Number: 1

Vantage Point UTM Easting: <u>453125</u> Northing: <u>4799726</u>	Date: <u>04/09/13</u> Start Time: <u>8:15am</u> End Time: <u>2:35pm</u>
--	--

Weather Conditions		
Temperature (C°): <u>5^oC</u>	Wind (Dir.): <u>NE</u>	Wind (B.S.): <u>1</u>
Cloud Cover (%): <u>100%</u>	Precipitation: <u>None</u>	

Description of Local Habitat Conditions and Adjacent Land Use:

Agriculture surrounding Pond as well as plantation to the East

Turtle species observed during monitoring period (Yes/No): No .If yes, fill in the table below.

Description of Turtles Observed

Species	UTMs	Length	Sex	#	Behaviour/ Description of visible traits
<u>None</u>					

Additional Notes

- Foggy day with cooler temperature
- did not observe any turtle signs
* recommended VP moved due to poor visibility

Photo Log

Photo ID	Description (locations, direction, observation, etc.)
<u>1</u>	<u>Too many shrubs at Vantage Point 1 - will have to move</u>
<u>2</u>	<u>View facing North on the West side</u>
<u>3</u>	<u>View facing South on the west side</u>





Legend

	Wind Energy Centre Study Area		Project Location
	Goshen Transmission Line Study Area		Permanent MET Tower
	Municipal Division		Access Roads
	120 m Area of Investigation		Collection Line
	Roads		Transmission Line
	Railway		Breaker Switch Station
	Natural Feature		Transformer Substation
	Watercourse (ABCA, SCRCA)		Laydown Yard
	Watercourse (MNR)		Disturbance Area

Turtle Wintering Areas

Significant Wildlife Habitat

Property Access

Denied

Granted

Location of Point Count

Transect/point count/average point locations and/or property access status may be subject to change and will be confirmed at the time of field surveys (e.g. depending on site conditions and/or landowner consultation)

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Metres

0 3.25 6.5 13 19.5 26

UTM Zone 17N, NAD 83 1:1,000

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Goshen Wind Energy Centre

Significant Wildlife Habitat

Field Map - TOW-01

March 2013

Project 60155032

AECOM

10:27 a.m → 10:47 a.m

27/ South

28 North

17T 453149 4799716

Species:

- Red winged Blackbird
- Am. Crow
- Picheral frog
- Am. Toad
- No. Flicker
- Am. Robin
- Flycatcher sp.



Legend

Wind Energy Centre Study Area	Project Location
Goshan Transmission Line Study Area	Permanent MET Tower
Municipal Division	Access Roads
120 m Area of Investigation	Collection Line
Roads	Transmission Line
Railway	Breaker Switch Station
Natural Feature	Transformer Substation
Watercourse (ABCA, SCRCA)	Laydown Yard
Watercourse (MNR)	Disturbance Area

Turtle Wintering Areas

Significant Wildlife Habitat

Property Access

Denied

Granted

Location of Point Count

Transmittal cover/percentage, point locations and property access status may be subject to change and will be confirmed at the time of field surveys (e.g. depending on site conditions and/or landowner consultation)

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Metres

0 3.25 6.5 13 19.5 25

UTM Zone 17N, NAD 83, 1:10,000

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Goshan Wind Energy Centre

Significant Wildlife Habitat

Field Map - TWO-01

March 2013
Project 60155032

AECOM

Turtle Wintering Area Survey Form

Study Area: <u>Gosler</u>	Observers: <u>Tom Stoney + Jess Piette</u>
Feature ID: <u>TWO-01</u>	

Fill in survey form for each vantage point. Vantage Point Number: 2

Vantage Point UTM <u>See Round # 2 Notes</u>	Date: <u>May 15, 2013</u>
Easting: _____ Northing: _____	Start Time: <u>12:22 P.M.</u> End Time: <u>12:42 P.M.</u>

Weather Conditions		
Temperature (C°): <u>21°</u>	Wind (Dir.): <u>SW</u>	Wind (B.S.): <u>4</u>
Cloud Cover (%): <u>0%</u>	Precipitation: <u>None</u>	

Description of Local Habitat Conditions and Adjacent Land Use:

- Adjacent land use Agricultural

Turtle species observed during monitoring period (Yes/No): NO .If yes, fill in the table below.

Description of Turtles Observed

Species	UTMs	Length	Sex	#	Behaviour/ Description of visible traits

Additional Notes

- Extremely Wind

Photo Log

Photo ID	Description (locations, direction, observation, etc.)
<u>113</u>	<u>North Portion of Pond</u>
<u>114</u>	<u>South Portion of Pond</u>





Legend

Wind Energy Centre Study Area	Project Location
Goshen Transmission Line Study Area	Permanent MET Tower
Municipal Division	Access Roads
120 m Area of Investigation	Collection Line
Roads	Transmission Line
Railway	Breaker Switch Station
Natural Feature	Transformer Substation
Watercourse (ABCA, SCRCA)	Laydown Yard
Watercourse (MNR)	Disturbance Area

Turtle Wintering Areas

Significant Wildlife Habitat

Property Access

Denied

Granted

Location of Point Count

Transect/point count/vantage point locations and/or property access status may be subject to change and will be confirmed at the time of field surveys (e.g. depending on site conditions and/or landowner consultation)

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Metres

0 2.5 5 10 15 20

UTM Zone 17N, NAD 83 1750

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Goshen Wind Energy Centre

Significant Wildlife Habitat

Field Map - TWO-03

March 2013

Project 60155032

AECOM

Turtle Wintering Area Survey Form

Study Area: <u>Goshen</u>	Observers: <u>Tom Sherney + Jess Prieto</u>
Feature ID: <u>TWO-03</u>	

Fill in survey form for each vantage point. Vantage Point Number: _____

Vantage Point UTM	Date: <u>04/16/13</u>
Easting: <u>446239</u> Northing: <u>4792466</u>	Start Time: <u>4:40 P.M.</u> End Time: <u>5:05 PM</u>
Weather Conditions	
Temperature (C°): <u>19°C</u>	Wind (Dir.): <u>NW</u> Wind (B.S.): <u>2</u>
Cloud Cover (%): <u>5%</u>	Precipitation: <u>None</u>

Description of Local Habitat Conditions and Adjacent Land Use:

- Surrounding land a combination of agriculture and Deciduous forest

Turtle species observed during monitoring period (Yes/No): _____ .If yes, fill in the table below.

Description of Turtles Observed

Species	UTMs	Length	Sex	#	Behaviour/ Description of visible traits

Additional Notes

Species: Sharp-shinned hawk? robin, flicker, Turkey Vulture,
4 Pring peppers, green from tadpoles
White headed nuthatch, Phoebe, golden crowned kinglet
17 Newt, hewed lark

Photo Log

Photo ID	Description (locations, direction, observation, etc.)
<u>98-99</u>	<u>Pond</u>





Appendix C

Vascular Plant Species List

BOTANICAL NAME	COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	COSEWIC Status	Global Status	Local Status Lambton County	Local Status Huron County	Date of Site Investigation	16-Apr-13	16-Apr-13	16-Apr-13
		Oldham et al	Oldham et al	Oldham et al	Newmaster			Newmaster	Tiedje 2004	Oldham 1993	Natural Area	204	227	
											ELC Community	CUW1	CUP3	CUM
GYMNOSPERMS		CONIFERS												
Pinaceae		Pine Family												
<i>Picea</i>	<i>abies</i>	Norway Spruce		5	-1	SE3		G?					U	
<i>Pinus</i>	<i>strobus</i>	Eastern White Pine	4	3		S5		G5	L3	X			F	
Apiaceae		Carrot or Parsley Family												
<i>Daucus</i>	<i>carota</i>	Wild Carrot		5	-2	SE5		G?		I				U
Asteraceae		Composite or Aster Family												
<i>Arctium</i>	<i>minus</i>	Common Burdock		5	-2	SE5		G?T?		I		R		
<i>Symphotrichum</i>	<i>species</i>	Aster Species										R		
<i>Solidago</i>	<i>species</i>	Goldenrod Species										R		U
<i>Taraxacum</i>	<i>officinale</i>	Common Dandelion		3	-2	SE5		G5		I		R		R
Brassicaceae		Mustard Family												
<i>Alliaria</i>	<i>petiolata</i>	Garlic Mustard		0	-3	SE5		G5		I		R		
Cornaceae		Dogwood Family												
<i>Cornus</i>	<i>racemosa</i>	Grey dogwood	2	-2		S5		G5?		X		U		
Dipsacaceae		Teasel Family												
<i>Dipsacus</i>	<i>fullonum ssp. sylvestris</i>	Wild Teasel		5	-1	SE5		G?T?		I		R		U
Fagaceae		Beech Family												
<i>Quercus</i>	<i>macrocarpa</i>	Bur Oak	5	1		S5		G5		X		F		
Guttiferae		St. John's-wort Family												
<i>Hypericum</i>	<i>perforatum</i>	Common St. John's-wort		5	-3	SE5		G?		I				R
Juglandaceae		Walnut Family												
<i>Carya</i>	<i>ovata var. ovata</i>	Shagbark Hickory	6	3		S5		G5				R		
Oleaceae		Olive Family												
<i>Fraxinus</i>	<i>pennsylvanica</i>	Green Ash	3	-3		S5		G5	C			U		
Rosaceae		Rose Family												
<i>Crataegus</i>	<i>species</i>	Hawthorn species										F		
Rubiaceae		Madder Family												
<i>Galium</i>	<i>asprellum</i>	Rough Bedstraw	6	5		S5		G5				R		
Salicaceae		Willow Family												
<i>Salix X</i>	<i>rubens</i>	Hybrid Crack Willow		-4	-3	SE4		HYB				R		
Ulmaceae		Elm Family												
<i>Ulmus</i>	<i>americana</i>	White Elm	3	-2		S5		G5?		X				R
MONOCOTYLEDONS		MONOCOTS												
Poaceae		Grass Family												
<i>Dactylis</i>	<i>glomerata</i>	Orchard Grass		3	-1	SE5		G?		I		U		U
<i>Poa</i>	<i>species</i>	Grass Species										F		
<i>Phalaris</i>	<i>arundinacea</i>	Reed Canary Grass	0	-4		S5		G5		X				F

Appendix D

Goshen Wind Energy Centre –
Waterfowl (Tundra Swan)
Stopover and Staging Areas
(Terrestrial) Pre-construction
Evaluation of Significance
Survey Results Letter (AECOM,
2013)

June 27, 2013

Amy Cameron
Renewable Energy Operations Team
Ministry of Natural Resources
300 Water Street, 4th Floor, South Tower
Peterborough, Ontario K9J 8M5

Dear Ms. Cameron:

Project No: 60155032

Regarding: Goshen Wind Energy Centre – Waterfowl (Tundra Swan) Stopover and Staging Areas (Terrestrial) Pre-construction Evaluation of Significance Survey Results

We are pleased to provide you with this letter documenting the results of the pre-construction surveys conducted to evaluate the significance of candidate significant Waterfowl (Tundra Swan) Stopover and Staging Areas (Terrestrial) features WSST-15 and WSST-36 identified in the Goshen Wind Energy Centre Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013) completed on behalf of Goshen Wind, Inc.

The Ministry of Natural Resources (MNR) issued a confirmation letter on January 15, 2013 stating that the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013) for the Goshen Wind Energy Centre (hereafter referred to as the Project) indicating that the information available was insufficient to support the development of Turbines 9, 46, 47 and 82. Therein, MNR indicated that candidate significant waterfowl stopover and staging habitats WSST-15 (near Turbine 9) and WSST-36 (near Turbines 46, 47 and 82) require additional wildlife surveys and information about potential negative environmental effects. The intent of this letter is to provide the determination of significance of candidate significant Waterfowl (Tundra Swan) Stopover and Staging Areas (Terrestrial) for features WSST-15 and WSST-36 based on results of pre-construction surveys completed in March 2013.

Methods

Habitat within the Goshen Wind Energy Centre was identified using a number of sources including site investigations, information provided by residents during public open houses, the Goshen Wind Energy Centre Avian Use Monitoring Report – 2010 (Golder Associates, 2011) and preliminary Tundra Swan migration surveys completed by AECOM in March 2012.

When a resident indicated that they had observed Tundra Swan within the Project Study Area, the location, approximate number of Tundra Swans observed, condition of the site when the observation was made (i.e. was it flooded, were forage crops present and if so what type) and observations related to whether site was used annually was obtained. In some instances, additional follow up

information was provided by landowners indicating new observations of Tundra Swans at the locations they had previously identified at an open house, or additional locations where they had observed Tundra Swans. AECOM biologists conducted site visits with willing residents where they travelled together to locations where Tundra Swans had been observed, to confirm the location and delineate the boundaries of areas that are prone to flooding.

The information presented in the Goshen Wind Energy Centre Avian Use Monitoring Report – 2010 (Golder Associates, 2011) was collected through the completion of a roadside survey where all roads within the Project Study Area were driven, with frequent stops made to survey fields and other habitats for birds. The shore of Lake Huron on the westernmost edge of the Avian Study Area was also surveyed. Fields and Lake Huron were scanned using a high power spotting scope and good quality binoculars, and all birds were identified and recorded.

The preliminary Tundra Swan migration surveys completed by AECOM in 2012 were conducted on three occasions approximately one week apart during the peak Tundra Swan migratory period in March 2012. All roads within the Goshen Wind Energy Study Area were driven, with frequent stops made to visually search fields and other habitats for Tundra Swans. To the extent possible, surveys were conducted under calm, clear weather conditions. Weather conditions (wind, cloud cover, temperature), start time and end time were recorded on all survey dates. Surveys were conducted between sunrise and noon, during the most active period for Tundra Swans. During the surveys, all waterfowl observed via binoculars and spotting scopes were recorded (i.e., at their approximate GPS point or by recording the location on a map so as to minimize disturbance), identified, and their age (adult or immature), and behaviour noted.

Due to the exceptionally mild and dry weather conditions experienced during the winter and spring of 2012, the information collected from the surveys during this period was not considered to be indicative of a typical Tundra Swan migration season. In particular, residents indicated that locations which typically flood and are used by Tundra Swans annually did not flood during the migration season in 2012. In an attempt to compensate for this, additional habitat mapping to delineate the approximate boundaries of flooded agricultural land within the Project Study Area was completed in the spring of 2012. Site visits to areas where Tundra Swan had been observed were completed and any signs of flooding (i.e. dark soils, piles of sticks or straw, depressions, topography, etc.) were recorded and mapped. The information collected during these field investigations, together with interpretation of ortho imagery (i.e. where dark soils were visible), was used to delineate the boundaries of the candidate Tundra Swan Stopover and Staging Habitats as presented in the Goshen Wind Energy Centre Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013). Due to the unusually dry spring in 2012, these boundaries do not represent actual observations of flooded areas but rather estimations based on field observations and interpretation of ortho imagery, as described above. A commitment was made within the Goshen Wind Energy Centre Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013) to complete additional pre-construction evaluation of significance surveys in order to confirm the significance of tow features (WSST-15 and WSST-36).

Pre-construction surveys were conducted over a three week period between March 12 and March 28, 2013 to evaluate the significance of candidate significant Waterfowl (Tundra Swan) Stopover and Staging Areas (Terrestrial) features WSST-15 and WSST-36, following the methods described in Section 4.2.3.1 of the Natural Heritage Assessment and Environmental Impact Study Report

(AECOM, 2013) with the following modification. The survey intensity was increased from three to six visits by conducting surveys twice per week in order to improve the accuracy of boundary delineation and ensure the peak Tundra Swan migration was captured for these candidate significant wildlife habitat features.

One survey station was placed per 0.5 km of candidate Tundra Swan stopover and staging habitat and was monitored for a minimum of 15 minutes. The GPS co-ordinates of each survey station were collected on the first visit and all additional surveys were completed from the same locations. Surveys were completed between sunrise and noon under calm, clear weather conditions, to the extent that was possible. Weather conditions (wind, cloud cover, temperature), start time and end time were recorded during each survey. Binoculars and a spotting scope were used at each survey location to observe waterfowl and record their number, location, age and behaviour (i.e. flight paths) of Tundra Swans. Pre-construction surveys were undertaken by a qualified Biologist; qualification of the field personnel is provided in Attachment 1. Detailed field notes are provided in Attachment 2.

Features were evaluated to determine whether they meet MNR (2011) criteria for significance based on the number of Tundra Swan observed (i.e. flooded agricultural fields with waste grains that are occupied by aggregations of 100 or more Tundra Swans with evidence of annual use).

Since the 2013 Tundra Swan migration period occurred under more typical climatic conditions, the habitat which had previously been delineated at these locations was refined based on the observations made during the 2013 pre-construction surveys. The boundaries of these features were delineated by identifying the outer limit of the flooded field area that was observed to be used (at least in some portion) by Tundra Swans or the outer limit of the area (not necessarily flooded) observed to be occupied by Tundra Swans that was adjacent the flooded area, whichever was larger. A 300 m buffer was then applied to this area and considered to form the boundary of the significant wildlife habitat.

Results and Discussion

A total of six visits took place during the pre-construction survey period between March 12 and March 28, 2013 at each candidate Significant Waterfowl (Tundra Swan) Stopover and Staging Area (Terrestrial) feature WSST-15 and WSST-36. The results of these surveys are individually discussed below.

WSST-15

During the pre-construction evaluation of significance surveys, no evidence of annual spring flooding or Tundra Swans were observed in agricultural fields at this feature. A total of 63 and 79 Tundra Swans flew over WSST-15 on March 26 and 28, 2013 respectively; however, none of the observed flyovers departed from or landed in the agricultural fields in or adjacent to the feature. A detailed summary of the survey results is provided in Table 1.

During Tundra Swan migration surveys completed in March 2012, more than 1860 Tundra Swans were observed feeding in corn stubble at this location. No flooding was observed in the field at that time. During the 2013 surveys, the fields within this feature were comprised primarily of tilled soil or winter wheat but not corn. These observations are consistent with the general observation made

through surveys conducted by AECOM and reported anecdotally by local residents that Tundra Swans preferentially feed in agricultural fields containing waste corn that have not been ploughed under. Their occurrence in fields which are not flooded is therefore influenced by agricultural practices and crop rotation cycles. Similarly, in the Long Point area, Tundra Swans tend to spend more time feeding in agricultural fields planted with corn the previous year, as waste corn contains a high carbohydrate content which facilitates fat deposition that is necessary for Tundra Swans to continue their spring migration (Petrie et al., 2002). The absence of this preferred food source, as well as the absence of flooding, appears to have contributed to the absence of Tundra Swans at this location in 2013. In addition the spring of 2012 was exceptionally early and dry, therefore hardly any flooding was present in the agricultural fields that normally flood each spring. As a result Tundra Swans did not concentrate in their usual fields and appeared to be more dispersed. Consequently we believe that the high numbers of swans present in this feature in 2012 is not typical.

Based on these results of the 2013 evaluation of significance survey, WSST-15 is not considered Significant Wildlife Habitat as it does not satisfy the criteria of significance prescribed in the Significant Wildlife Habitat Technical Guide (SWHTG) Ecoregion 7E Criterion Schedule (MNR, 2011), which requires the presence of a flooded agricultural field with waste grains used annually by 100 or more Tundra Swans. Therefore mitigation measures and monitoring commitments described in the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013) for this feature need not be applied, and the proposed Turbine 9 is not located within 120 m of a Significant Waterfowl (Tundra Swan) Stopover and Staging Area (Terrestrial).

Table 1. WSST-15 Pre-construction Survey Results

Date	Time	Weather Conditions	Number of Waterfowl Observed	Flooding Observed	Comments
March 12, 2013	11:00 am to 11:50 am	Temp: -1°C Wind Direction: S Cloud Cover: 100% Beaufort Scale: 2/3 Precipitation: Light Snow	0 – Tundra Swan	No flooding observed within or adjacent to WSST-15	No Tundra Swans observed
March 14, 2013	10:43 am to 11:30 am	Temp: -1°C Wind Direction: N Cloud Cover: 60% Beaufort Scale: 3 Precipitation: None	0 – Tundra Swan	No flooding observed within or adjacent to WSST-15	No Tundra Swans observed
March 19, 2013	10:30 am to 11:35 am	Temp: -2°C Wind Direction: SW Cloud Cover: 100% Beaufort Scale: 3 Precipitation: Snow	0 – Tundra Swan	No flooding observed within or adjacent to WSST-15	No Tundra Swans observed
March 21, 2013	10:40 am to 11:35 am	Temp: -5°C Wind Direction: E Cloud Cover: 100% Beaufort Scale: 3 Precipitation: Snow	0 – Tundra Swan	No flooding observed within or adjacent to WSST-15	No Tundra Swans observed
March 26, 2013	10:50 am to 11:45 am	Temp: 1°C Wind Direction: NE Cloud Cover: 100% Beaufort Scale: 2 Precipitation: None	63 – Tundra Swan 12 – Canada Goose	No flooding observed within or adjacent to WSST-15	Three groups of 18, 22 and 23 Tundra Swans observed flying north over the site.

Date	Time	Weather Conditions	Number of Waterfowl Observed	Flooding Observed	Comments
March 28, 2013	10:15 am to 11:05 am	Temp: 3°C Wind Direction: NW Cloud Cover: 100% Beaufort Scale: 2 Precipitation: None	79 – Tundra Swan 23 – Canada Goose	No flooding observed within or adjacent to WSST-15	Three groups of 11, 41 and 15 Tundra Swans observed flying northeast over the site. One group of 12 Tundra Swan observed flying northwest over the site.

WSST-36

During the 2013 pre-construction evaluation of significance surveys, more than 370 Tundra Swans were observed feeding in two locations of flooded agricultural fields with waste grains within feature WSST-36. A detailed summary of the survey results is provided in Table 2.

No Tundra Swans were observed in this location during the 2012 Tundra Swan migration surveys; however, local residents have reported this as an area that is typically used by Tundra Swans during the annual spring migration. Although the area typically floods in the early spring, it did not flood in 2012, which likely accounts for the absence of Tundra Swans in this location during the 2012 survey. Based on these observations, WSST-36 is confirmed as Significant Wildlife Habitat as it satisfies the criteria of significance prescribed in the SWHTG Ecoregion 7E Criterion Schedule (MNR, 2011).

Due to the lack of flooding in 2012, the boundaries of this candidate significant wildlife habitat feature were delineated in the Natural Heritage Assessment (AECOM, 2013) through air photo interpretation and the extent of potential flooding estimated through a field visit. The boundaries of this Significant Wildlife Habitat feature were further refined using the 2013 evaluation of significance survey results by applying a 300 m buffer to the flooded areas that were occupied by 100 or more Tundra Swans (refer to Figure 1). These refined boundaries more closely reflect the location where residents have reported annual use by Tundra Swans.

Based on the refined habitat boundary, only Turbine 46 is located within 120 m of feature WSST-36, and this turbine is outside the 300 m buffer area associated with this habitat. Therefore only Turbine 46 is required to receive the mitigation measures and post-construction monitoring commitments described in the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013). However, due to proximity of Turbine 46 to WSST-36 and its location between the two flooded areas comprising this feature, there may be increased potential for collision or displacement of Tundra Swans to occur as a result of this turbine. The significance of these potential effects is difficult to accurately predict due to the lack of available scientific data on the impacts of wind turbines on Tundra Swans.

Turbines 47 and 82, which were previously described as being within feature WSST-36 in the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013), are now located more than 120 m from the refined boundary of this feature and thus need not receive mitigation measures or post-construction monitoring associated with Tundra Swans.

In addition to the Tundra Swans recorded in the flooded agricultural fields within WSST-36, approximately 280 Tundra Swans in several flocks were observed flying over the site on March 26, 2013. The approximate flight paths of these flocks are documented on Figure 1. Generally the observed Tundra Swans did not land in or depart from any of the agricultural fields within feature WSST-36. However, one group of 26 Tundra Swans was documented flying towards WSST-36 from the south and landing within the flooded fields on March 12, 2013.

The majority of the Tundra Swans flying over appeared to approach the feature from the west and south. Tundra Swans flying from the west avoided an existing transmission line corridor extending north and south along the middle of agricultural fields, approximately 800 m east of Goshen Line, by either turning north and flying parallel to the transmission line corridor or flying straight over it and continuing on east. Several of these flight paths were in close proximity to the proposed locations of Turbines 47, 82 and 48; however, these Turbines are more than 120 m away from the refined boundaries of the confirmed significant feature WSST-36. None of the Tundra Swan flying over landed in the agricultural fields, and flight paths alone are not used as a criterion to delineate this type of Significant Wildlife Habitat based on the SWHTG Ecoregion 7E Criterion Schedule (MNR, 2011). Nevertheless, observations from this survey suggest that Tundra Swans are capable of identifying tall infrastructures from a distance and adjusting their flight paths accordingly to avoid potential collisions; thus, it is highly likely that they will avoid Turbines should they be in their flight paths.

It should also be noted that the purpose of these pre-construction surveys was to record Tundra Swan activity solely within the general vicinity of features WSST-15 and WSST-36 and did not include extensive investigations or recording of Tundra Swan activity for the entire Project Study Area. Flight paths at this location were recorded as incidental observations and were spatially limited to the extent of distances visible from each vantage point at feature WSST-36. Therefore, flight paths recorded at this location do not necessarily represent a significantly concentrated area of Tundra Swans movement in relation to the entire Project Study Area. Flocks of Tundra Swans can be expected to fly over any parts of Project Study Area during their migrations.

Table 2. WSST-36 Pre-construction Survey Results

Date	Time	Weather Conditions	Number of Waterfowl Observed	Flooding Observed	Comments
March 12, 2013	7:56 am to 10:19 am	Temp: 2°C Wind Direction: S Cloud Cover: 100% Beaufort Scale: 2 Precipitation: None	144 – Tundra Swan 6 – Canada Goose 34 – Mallard 20 – Northern Pintail 8 – Unidentified Duck 20 - American Widgeon	Flooding observed at three locations shallow flooding north and south of Crediton Road east of the agricultural drain, north and south of South Road to east and west of agricultural drain, and approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.	All Tundra Swans observed within and adjacent the flooded portion of the field to the north and south of South Road. Of the 144 Tundra Swans observed, a group of 26 Tundra Swans flew from the south during the survey and landed in this area.

Date	Time	Weather Conditions	Number of Waterfowl Observed	Flooding Observed	Comments
March 14, 2013	8:20 am to 10:05 am	Temp: -2°C Wind Direction: N Cloud Cover: 60% Beaufort Scale: 3 Precipitation: None	230 – Tundra Swan 36 – Mallard 12 – Canada Goose	Flooding observed at two locations north of South Road to the west of the agricultural drain and south of South Road to east of the agricultural drain, and approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.	Two groups of Tundra Swans observed at two locations within WSST-36; over 100 Tundra Swans observed in the flooded area south of South Road, and 130 Tundra Swans observed in the flooded area located approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.
March 19, 2013	8:23 am to 10:15 am	Temp: -3°C Wind Direction: SW Cloud Cover: 100% Beaufort Scale: 3 Precipitation: Light Snow	0 – Tundra Swan 1 – Canada Goose 10 – Unidentified Duck	Flooding observed approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.	No Tundra Swans Observed
March 21, 2013	9:55 am to 10:10 am	Temp: -5°C Wind Direction: E Cloud Cover: 100% Beaufort Scale: 3 Precipitation: Snow	0 – Tundra Swan 2 - Mallard	Flooding observed approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.	No Tundra Swans Observed
March 26, 2013	9:30 am	Temp: 1°C Wind Direction: NE Cloud Cover: 100% Beaufort Scale: 1 Precipitation: None	280 – Tundra Swan 9 - Mallard	Flooding observed approximately 500 m north of Mount Carmel Drive and 250 m east of Goshen Line.	Approximately 280 Tundra Swan observed flying north and northeast over the site in 14 groups ranging in size from 3 to 42 birds. Predominate direction was north and northeast. Several groups observed approaching transmission lines that bisect site and turning north once within 500 m to 1 km of tower structures.
March 28, 2013	8:00 am	Temp: 1°C Wind Direction: W Cloud Cover: 100% Beaufort Scale: 1/2 Precipitation: None	0 – Tundra Swan 8 – Mallard 36 – Unidentified Duck	No flooding observed within or adjacent WSST-36	No Tundra Swans Observed

Incidental Observations

In addition to the detailed surveys completed at WSST-15 and WSST-36 incidental Tundra Swan observations were also recorded at two other locations. One group of approximately 250 Tundra Swans was observed in a field with waste grains and no evidence of annual spring flooding located 500 m southwest of the intersection of Goshen Line and Kirkton Road. Another group of approximately 200 Tundra Swans was recorded in an agricultural field with waste grains and no flooding located 250 to 1000 m southeast of the intersection of Mollard Line and South Road. Neither of these fields were flooded and therefore do not satisfy the criteria of significance as prescribed by the SWHTG Ecoregion 7E Criterion Schedule (MNR, 2011).

It is noted that the type of waste grain present within the fields at the time of Tundra Swan migrations plays an important role in the selection of feeding areas. Observations completed over the past two migration seasons indicate that while Tundra Swan can be found in fields containing winter wheat and soy bean waste crop, their preference appears to be corn as a waste grain. However, it cannot be guaranteed that the same type of crop will be planted in the same field from year to year and therefore the location of feeding areas for Tundra Swans may change from one year to another. Spring flooding is a more consistent and predictable natural condition and therefore a better indication of areas likely to be used regularly by staging Tundra Swans than crop type alone.

Summary

The results of the pre-construction surveys confirm that Waterfowl (Tundra Swan) Stopover and Staging Area (Terrestrial) feature WSST-36 is Significant Wildlife Habitat. The boundaries of this Significant Wildlife Habitat were refined based on the observed locations of flooded agricultural fields with waste grains occupied by 100 or more Tundra Swans during the surveys conducted between March 12 and March 28, 2013. As a result, Turbine 46 is located within 120 m of the Significant Wildlife Habitat and must receive the mitigation measures and post-construction monitoring as described in Section 5.7.3 of the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013).

Feature WSST-15 is confirmed as not Significant Wildlife Habitat as it does not satisfy the criteria of significance as prescribed by the SWHTG Ecoregion 7E Criterion Schedule (MNR, 2011) which requires the presence of a flooded agricultural field with waste grains used annually by 100 or more Tundra Swans. Consequently, the mitigation measures and monitoring commitments described in Section 5.7.3 of the Natural Heritage Assessment and Environmental Impact Study Report (AECOM, 2013) for this feature need not be applied.

Should you have any questions or concerns regarding the information contained herein, please do not hesitate to contact the undersigned.

Sincerely,
AECOM Canada Ltd.

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Attach

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