Appendix B

Study Reports

GOLDER
MEMBER OF WSP

October 25, 2021 Project No. 19125451

Mr. Mark Buchanan, P.Eng., Associate, Senior Civil Engineer
J. L. Richards & Associates Limited
864 Lady Ellen Place,
Ottawa, ON K1Z 5M2

DESKTOP SPECIES AT RISK SCREENING IN SUPPORT OF THE MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR THE NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION TOWNSHIP OF NORTH DUNDAS, ONTARIO

Mr. Buchanan,

Golder Associates Ltd. (Golder) was retained by J.L. Richards & Associates Limited (JLR) to complete a desktop Species at Risk (SAR) screening in support of the municipal environmental assessment (EA) being completed for the proposed Township of North Dundas drinking water supply system expansion project. As part of the EA, a watermain has been proposed between the towns of Morrisburg and Winchester. The proposed watermain extends approximately 24 km, generally following the right-of-way of County Road 31, Ontario (the Site; Figures 1A – 1I).

The purpose of this SAR screening is to describe the existing plant communities on the Site and in the Study Area (area within 120 m of the Site) and outline the SAR with moderate or high potential to be present based on those habitats, outline potential negative effects on SAR or their suitable habitat from the proposed project, discuss any related regulatory implications under applicable legislation, recommend high-level mitigation measures, and identify the need for further study or agency consultation, if necessary.

1.0 LEGISLATIVE CONTEXT

1.1 Species at Risk Act (SARA)

At a federal level, species at risk (SAR) designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment and Climate Change, species are added to the federal List of Wildlife Species at Risk (Canada 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA) (Canada 2002). On private or provincially-owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under the SARA, unless ordered by the Governor in Council.

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1.2 Endangered Species Act (ESA)

SAR designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of Environment, Conservation and Parks, species are added to the provincial *Endangered Species Act* (ESA) which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or endangered. As of June 30, 2008, the Species at Risk Ontario (SARO) list is contained in O. Reg. 230/08.

Subsection 9(1) of the ESA prohibits the killing, harming or harassing of species identified as 'endangered' or 'threatened' in the various schedules to the Act. Subsection 10(1)(a) of the ESA states that *"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario (SARO) list as an endangered or threatened species"*.

General habitat protection is provided, by the ESA, to all threatened and endangered species. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. The ESA has a permitting process to allow alterations to protected species or their habitats as well as a registration process for certain activities and species.

2.0 METHODS

Golder conducted a desktop review of published natural heritage data and information available for the Site and the Study Area. This information served to identify SAR known to be present or having the potential to be present. Information sources consulted included:

- Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) Natural Heritage Information Centre (NHIC) Make-a-Map geographic explorer for SAR and rare (S1-S3) species reported as occurring in the vicinity of the Site (MNDMNRF 2021a)
- Land Information Ontario (LIO) geospatial data (MNDMNRF 2021b)
- Species at Risk Public Registry (ECCC 2021)
- Species at Risk in Ontario (SARO) List O. Reg. 230/08 (MNDMNRF 2021c)
- DFO Aquatic Species at Risk Maps (DFO 2021)
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Vascular Plants at Risk in Ontario (Leslie 2018)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2021)
- Bat Conservation International (BCI) range maps (BCI 2021)
- Ontario Butterfly Atlas (Jones et al. 2021)
- eBird species maps (eBird 2021)
- Aerial imagery

A SAR screening was completed for the Site and Study Area and focused on the review of records and range maps pertaining to species that are designated as threatened, endangered or special concern under the ESA, and species that are protected under Schedule 1 of the SARA. Provincially rare species (provincial ranking of S1-S3) with known records on the Site or in the Study Area were also considered.

The published SAR data assisted in determining the potential for habitats of SAR to be present. Data from the desktop habitat mapping exercise described below was used in combination with the background data to determine a revised probability of SAR and/or SAR habitats on the Site and in the Study Area. The probability rankings presented in this technical memorandum are conservative, as no in-field verification has been undertaken.

To assess the potential SAR habitats on the Site or in the Study Area, a desktop habitat mapping exercise was completed. A biologist trained in Ecological Land Classification (ELC) (Lee et al. 1998) reviewed publicly available aerial imagery of the Site and Study Area, and mapped plant communities to the Community Series level. Boundaries of wetlands were determined based on MNDMNRF mapping (MNDMNRF 2021b).

3.0 RESULTS

3.1 Existing Conditions

The Site consists of Highway 31 and the gravel shoulder, with no natural habitats present. The Study Area consists mainly of agricultural lands (row crops, hayfields, pastures, hedgerows), rural residences, small businesses and farms, road intersections, and localized areas of natural habitat (Figures 1A – 1I). Based on the desktop assessment, natural habitats in the Study Area appear to consist mainly of small woodlots of deciduous and mixed forests and swamps, thickets and thicket swamps, and limited areas of marsh. A few small ponds were also evident on aerial imagery. The largest blocks of habitat are primarily located in the southern third of the Study Area between the towns of Williamsburg and Morrisburg. In addition, there are numerous watercourse crossings including municipal drains and natural watercourses (e.g., South Nation River).

3.2 Species at Risk Screening

Based on the SAR screening (Attachment A), a number of SAR were identified as having potential to be present in the Study Area as discussed below.

3.2.1 Endangered and Threatened Species

There are seventeen endangered and threatened species that have moderate or high potential to be present in the Study Area. The habitat requirements of each of these species is presented in Attachment A, but have been generalized below:

- Rusty-patched bumble bee (*Bombus affinis*) – open and semi-open habitats
- Bank swallow (*Riparia riparia*) – banks and road cuts
- Barn swallow (*Hirundo rustica*) – accessible buildings, bridges
- Bobolink (*Dolichonyx oryzivorus*) – hayfields, pastures and meadows
- Chimney swift (*Chaetura pelagica*) – accessible chimneys and stacks
- Eastern meadowlark (*Sturnella magna*) – open areas

- Eastern whip-poor-will (*Caprimulgus vociferus*) – forested areas and clearings
- Least bittern (*Ixobrychus exilis*) – large marshes
- Cutlip minnow (*Exoglossum maxillingua*) – small and medium watercourses
- Eastern small-footed myotis (*Myotis leibii*) – rock piles, talus
- Little brown myotis (*Myotis lucifugus*) – treed areas and buildings
- Northern myotis (*Myotis septentrionalis*) – treed areas
- Tri-coloured bat (*Perimyotis subflavus*) – treed areas
- American ginseng (*Panax quinquefolia*) – forested areas
- Butternut (*Juglans cinerea*) – open and forested upland areas
- Eastern prairie fringed-orchid (*Platanthera leucophaea*) – fens, bogs, wet meadows
- Black ash (*Fraxinus nigra*) – although not currently considered a SAR, this species will be added as an endangered species to O. Reg. 230/08 in January 2022. This species is associated with swamps.

As the Site consists of an active roadway and gravel shoulders, only barn swallows are identified as potentially present on the Site (i.e., potentially nesting on bridges). Aquatic species listed above (e.g., fish and turtle species) may be present where the Site crosses watercourses.

Species identified in Attachment A as having a low probability of occurrence are not discussed further in this technical memorandum. Additional studies are required to determine the presence or absence of the species listed above and, if present, the extent of their habitats at the Site or in the Study Area. Any removal of the habitats of threatened or endangered species must be undertaken in accordance with the ESA and the associated regulations.

3.2.2 Special Concern and Provincially Rare Species

Six species listed as special concern under the ESA have potential to be present in the Study Area, including: monarch (*Danaus plexippus*), Canada warbler (*Cardellina canadensis*), eastern wood-pewee (*Contopus virens*), evening grosbeak (*Coccothraustes vespertinus*), wood thrush (*Hylocichla mustelina*), and snapping turtle (*Chelydra serpentina*). Monarch primarily inhabits open areas and forest edges, while the bird species are forest species. Snapping turtle inhabits a range of waterbodies, including wetlands, streams and rivers. Of these species, only snapping turtle is potentially present on the Site (i.e., potentially nesting in the gravel shoulder).

In addition, five provincially rare species are known to occur in the Study Area, including: western chorus frog (*Pseudacris triseriata*), lakecress (*Rorippa aquatica*), lizard's tail (*Saururus cernuus*), Smith's bulrush (*Schoenoplectiella smithii*) and greater redhorse (*Moxostoma valenciennesi*). Each of these species inhabits wetlands and shorelines.

The detailed habitat requirements of each of these species is presented in Attachment A. As no permitting under any SAR legislation is required to disturb habitats of species identified under the ESA as special concern, or for provincially rare species, mitigation should focus on protection of individuals during construction (see Section 4.0).

4.0 MITIGATION AND RECOMMENDATIONS

Golder understands the majority of the proposed works will occur within the right-of-way of Highway 31, therefore there is limited potential for the project to impact SAR or their associated habitats. Potential impacts will primarily be limited to potential harm to individuals who may enter work areas, and potential harm to individuals or habitats where intrusion into natural areas is required. Based on this, Golder recommends the following:

- The Site and Study Area both contain potential habitat for species listed as endangered and threatened under the ESA. To apply for a permit or register an activity under the ESA, the presence / location of these species would need to be confirmed, and the extent of their habitats to be impacted must be quantified through additional study. This must be undertaken at the detailed design stage once the necessary specifics regarding the project are known (e.g., area of disturbance). Permitting and/or registration needs under the ESA, along with mitigation and compensation requirements, would be determined at that time.
- Complete daily inspections of work areas for evidence of wildlife, particularly SAR, and develop a Wildlife Encounter Protocol to be implemented in the event that wildlife enter the work area.
- A Worker Awareness Package should be prepared at the time of construction and be circulated to all site staff to ensure they are aware of the SAR potentially present in the Study Area, and appropriate steps to take in the event that one is encountered.
- If working adjacent to wetlands during the active season for turtles (May – October), install turtle exclusion fencing around work areas to prevent turtles from entering the work areas and/or attempting to nest in the right of way where work will occur. Fencing should occur prior to May 1, and in accordance with the "Species at Risk Branch Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing" (MNDMNRF 2013; Attachment B).
- Avoid clearing vegetation during the breeding bird window (April 1 – August 15) to avoid contravention of the *Migratory Birds Convention Act* (Canada 1994). If clearing must take place during this time, have a qualified biologist perform a nesting survey at least 48 hours prior to clearing.
- Work in and near water must comply with the fish and fish habitat protection provisions of the *Fisheries Act* (Canada 1985) by incorporating measures to avoid causing death of fish or harmful alteration, disruption, or destruction (HADD) of fish habitat (DFO 2019). These mitigation measures would also assist in protecting other wildlife and plant species discussed in this memorandum as being wetland and shoreline affiliates.
- Where work is proposed below the high-water line of watercourses, or where the proposed work has potential to impact a watercourse, a project review by Fisheries and Oceans Canada (DFO) will be required to determine appropriate timing windows, mitigations, and permitting needs, if any.
- If aquatic SAR protected under the SARA are determined to be present or likely present in watercourses that may be affected by the proposed project, consultation with DFO and/or Environment and Climate Change Canada (ECCC) will be required to determine appropriate timing windows, mitigations, and permitting needs, if any. This consultation can take place as part of the project review described above.
- Implement construction best management practices, such as spill prevention, dust and noise reduction, and sediment and erosion control, to reduce impacts to wildlife and their habitats.

5.0 LIMITATIONS

This report was prepared for J.L. Richards & Associates Limited. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by Golder, and reflects the conditions within the Study Area at the time of this assessment, and is based solely on data obtained by Golder from external sources as described in this report. Golder has exercised reasonable skill, care and diligence to assess the external data acquired during the preparation of this assessment, but makes no guarantees or warranties as to the accuracy, currency or completeness of this information. This report is based upon and limited by circumstances and conditions acknowledged herein, and upon information available at the time of authoring.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

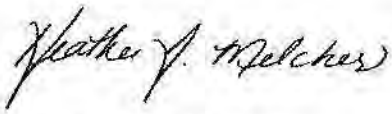
6.0 CLOSURE

We trust this report meets your current requirements. If you have any questions regarding this letter, please contact the undersigned.

Sincerely,

Golder Associates Ltd.

Gwendolyn Weeks, H.B.Sc.Env.
Senior Ecologist



Heather Melcher, M.Sc.
Senior Ecologist, Principal

GAW/HM/sg
https://goldenassociates.sharepoint.com/sites/111069/project files/6 deliverables/ser screening/19125451_ser screening report_draft.docx

CC: Brian Henderson, Golder
Paul Smolkin, Golder

Attachments: Figures 1A – 1I – Species at Risk Assessment
Attachment A – Species at Risk Screening
Attachment B – Reptile and Amphibian Exclusion Fencing

7.0 REFERENCES

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KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
- AGRC - Agricultural Fields
- CUM1 - Meadow
- CUT/CUW - Thicket/Open Woodland
- RES/COM - Residential/Commercial
- ROADWAY
- RAILROAD
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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0 100 200 400
1:10,000 METRES

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PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL EA

TITLE
SPECIES AT RISK ASSESSMENT

CONSULTANT
GOLDER
MEMBER OF WSP

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DESIGNED	—
PREPARED	BR
REVIEWED	GW
APPROVED	HM

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KEY MAP

SCALE 1:400,000

LEGEND

	SITE		ROADWAY
	STUDY AREA		WATERCOURSE
	ELC		WATERBODY
	AGRC - Agricultural Fields		
	CUM1 - Meadow		
	RES/COM - Residential/Commercial		

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MEMBER OF WSP

YYYY-MM-DD	2022-01-16
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PREPARED	BR
REVIEWED	GW
APPROVED	HM

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KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
- ROADWAY
- WATERCOURSE
- WATERBODY

AGRC - Agricultural Field
CUT/CUW - Thicket/Open Woodland
FOD - Deciduous Forest
MAM - Meadow Marsh
RES/COM - Residential/Commercial

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CONSULTANT
GOLDER
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KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
- AGRC - Agricultural Fields
- CUM1 - Meadow
- RES/COM - Residential/Commercial
- SWD - Deciduous Treed Swamp
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND

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SPECIES AT RISK ASSESSMENT

CONSULTANT
GOLDER
MEMBER OF WSP

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KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
  - AGRC - Agricultural Field
  - CUM1 - Meadow
  - CUT/CUW - Thicket/Open Woodland
  - FOD - Deciduous Forest
  - RES/COM - Residential/Commercial
- ROADWAY
- UTILITY LINE
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY

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KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
- AGRC - Agricultural Fields
- FOD - Deciduous Forest
- FOM - Mixed Forest
- RES/COM - Residential/Commercial
- ROADWAY
- UTILITY LINE
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- WATERBODY

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WWW-MM-DD	2020-01-16
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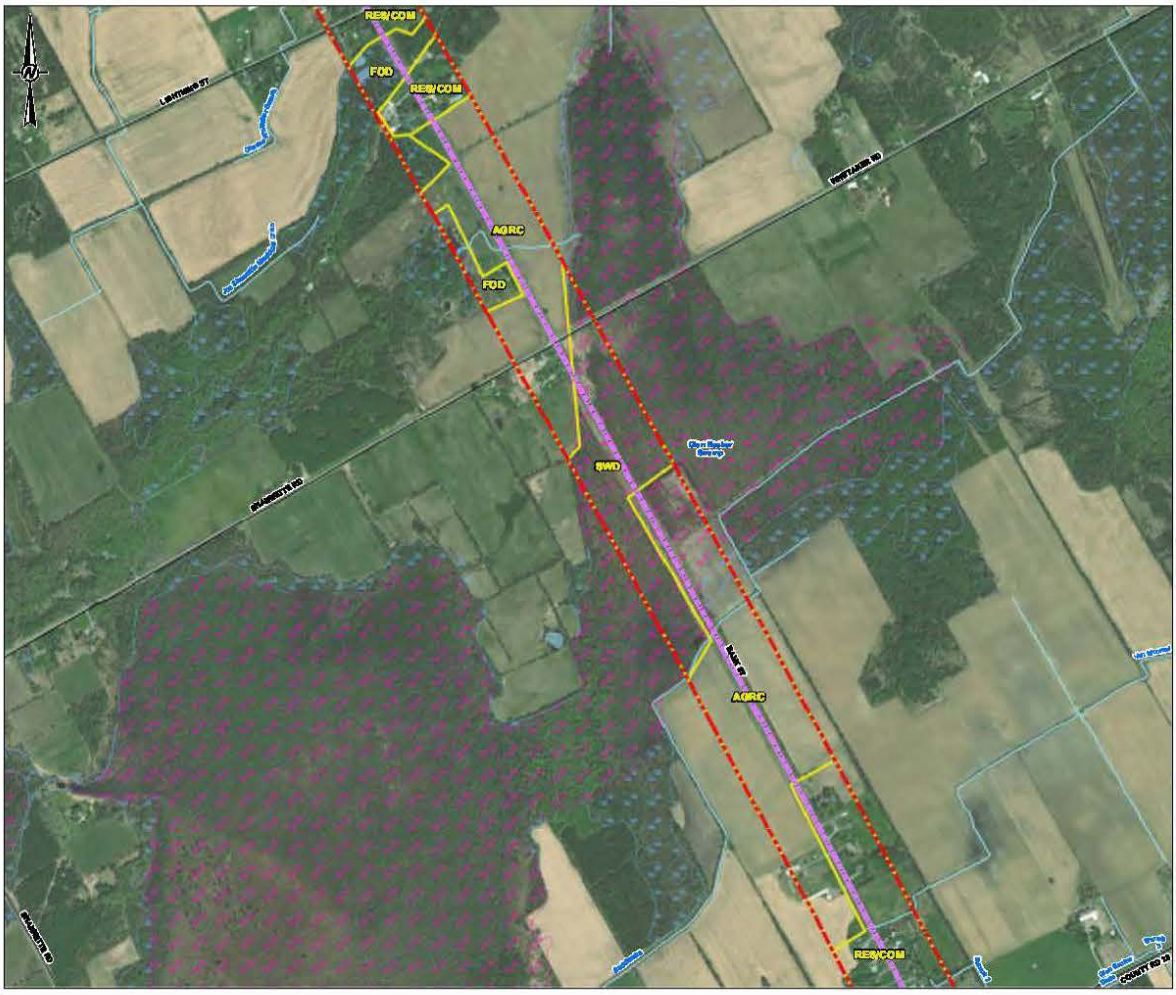

KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- ELC
  - AGRC - Agricultural Fields
  - FOD - Deciduous Forest
  - RES/COM - Residential/Commercial
  - SWD - Deciduous Treed Swamp
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400
1:10,000 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LTD.

PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL EA

TITLE
SPECIES AT RISK ASSESSMENT

CONSULTANT
GOLDER
MEMBER OF WSP

WWW-MM-DD	2020-01-16
DESIGNED	---
PREPARED	BR
REVIEWED	GW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19139481	0000	0	1G

KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- RLC
- AGRC - Agricultural Fields
- CUM1 - Meadow
- FOD - Deciduous Forest
- MAM - Meadow Marsh
- MAS - Shallow Marsh
- RES/COM - Residential/Commercial
- SWD - Deciduous Treed Swamp
- ROADWAY
- UTILITY LINE
- RAILROAD
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- WATERBODY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LIMO INFORMATION ONTARIO & (C) OGDA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTH-STAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400
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TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL EA

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DESIGNED	---
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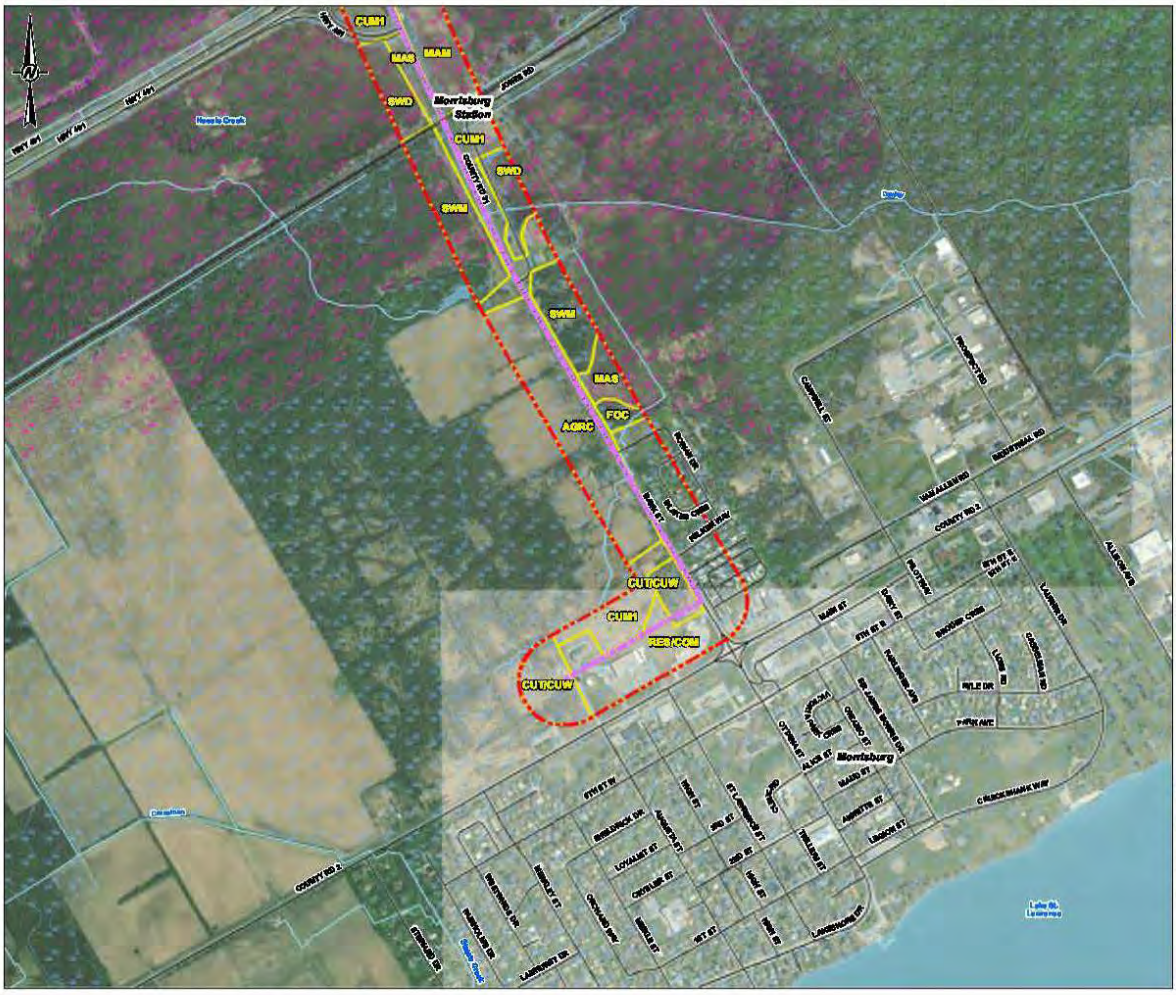
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19139491	0000	0	1H



KEY MAP

SCALE 1:400,000

LEGEND

- SITE
- STUDY AREA
- RLC
- AGRC - Agricultural Fields
- CUM1 - Meadow
- CUM1 - Meadow
- CUT/CUW - Thicket/Open Woodland
- FOC - Coniferous Forest
- MAM - Meadow Marsh
- MAS - Shallow Marsh
- RES/COM - Residential/Commercial
- SWD - Deciduous Treed Swamp
- SWM - Mixed Treed Swamp
- ROADWAY
- UTILITY LINE
- RAILROAD
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED-PROVINCIAL WETLAND
- WATERBODY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTH-STAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400
1:10,000 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LTD.

PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL EA

TITLE
SPECIES AT RISK ASSESSMENT

CONSULTANT
GOLDER
MEMBER OF WSP

WWW-MM-DD	2020-01-10
DESIGNED	---
PREPARED	BR
REVIEWED	CW
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
19139481	0000	0	11

ATTACHMENT A

Species at Risk Screening

Taxon	Common Name	Scientific Name	Global Rarity Rank[1]	Provincial Rarity Rank[2]	Source(s)	Ontario Habitat Descriptions	Likelihood of Occurrence	ESA Listed Protection Provisions[3]	Reference
Amphibian	Western chorus frog - Great Lakes St. Lawrence / Canadian Shield population	*Pseudacris triseriata*	G5TNR	S3	NHIC; ORAA	In Ontario, habitat of this amphibian species typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding (Environment Canada 2015).	High - Records of this species in the Study Area and suitable habitat may be present where wetlands with thick shrub layers are present.		Environment Canada. 2015. Recovery Strategy for the Western Chorus Frog (Pseudacris triseriata), Great Lakes/ St. Lawrence - Canadian Shield population, in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment Canada; [accessed 29 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Re-WesternChorusFrog(GLSLEC+CSI)-v00-2015Dec01_e.pdf. vi + 50 p.
Arthropod	Monarch	*Danaus plexippus*	G4	S2N, S4B	COA	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there is milkweed (*Asclepias* spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	High - Records of this species in the Study Area and suitable habitat is present in the form of unmaintained roadsides, meadows, and hedgerows.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Monarch_0810_e1.pdf. vii + 43 p.
Arthropod	Rusty-patched bumble bee	*Bombus affinis*	G1	S1	Range	In Ontario, rusty-patched bumble bee is found in areas from the southern Great Lakes – St. Lawrence forest region southwards into the Carolinian forest. It is a habitat generalist, but it is typically found in open habitats, such as mixed farmland, savannah, marshes, sand dunes, urban and lightly wooded areas. It is cold–tolerant and can be found at high elevations. Most recent sightings in Ontario have been in oak savannah habitat with well–drained, sandy soils and moderately open canopy. It requires an abundance of flowering plants for forage. This species most often builds nests underground in old rodent burrows, but also in hollow tree stumps and fallen dead wood (Colla and Taylor-Pinder 2011). The only recent sightings in Ontario are from the Pinery Provincial Park.	Moderate - No records of this species in the Study Area, however, the Study Area lies within the range of this species and suitable habitat may exist in open and semi-open natural habitats.	Regulated In the geographic areas of where species occurs south of 45°30'0" north latitude (approximately south of Algonquin Park) Regulated Habitat: • any nesting or hibernation site and surrounding 30 m area • natural areas within 500 m of a rusty-patched bumble bee that provide suitable foraging conditions (i.e. prairie, savannah, woodland, marsh, bog, forest, sand dune, old field or similar areas); and if these areas extend beyond 500 m, these areas protected up to an additional 500 m • natural areas that provide suitable foraging conditions between Apr 1 to May 31 that fall between 500 m and 1000 m of a rusty-patched bumble bee • areas protected until 5 consecutive years of non-use • unsuitable habitat includes open water and built-up areas (e.g. roads, parking lots) • regulation does not apply to areas used in past 12 months for pasture, growing, producing or raising farm animals, producing agricultural crops, or growing a garden or lawn	Colla SR, Taylor-Pinder A. 2011. Recovery Strategy for the Rusty-patched Bumble Bee (Bombus affinis) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 29 November 2019]. https://www.ontario.ca/page/rusty-patched-bumble-bee-recovery-strategy. vi + 21 p.
Bird	Bank swallow	*Riparia riparia*	G5	S4B	OBBA	In Ontario, bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and riverbanks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided (Garrison 1999).	High - Records of this species in the Study Area and suitable habitat may be present along streams banks and road cuts.	General [Draft] Category 1 – Breeding colony, including burrows and substrate between them Category 2 – Area within 50 m of the front of breeding colony face Category 3 – Area of suitable foraging habitat within 500 m of the outer edge of breeding colony	Garrison BA. 1999. Bank Swallow (Riparia riparia). The Birds of North America Online (AF Poole and FB Gill, eds). Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.414.
Bird	Barn swallow	*Hirundo rustica*	G5	S4B	OBBA	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on ledges underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 2019).	High - Records of this species in the Study Area and suitable habitat may be present in or on buildings.	General Category 1 – Nest Category 2 – Area within 5 m of the nest Category 3 – Area between 5-200 m of the nest	Brown MB, Brown CR. 2019. Barn Swallow (Hirundo rustica). In The Birds of North America Online (P. G. Rodewald, ed), version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 20 November 2019]. https://doi.org/10.2173/bna.barswa.02. COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2011. COSEWIC assessment and status report on the Barn Swallow Hirundo rustica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf. ix + 37 p.

Taxon	Common Name	Scientific Name	Global Rank/ Trend[1]	Provincial Rank/ Rank[2]	Source(s)	Ontario Habitat Description	Likelihood of Occurrence	SAR Habitat Protection Provisions[3]	Reference
Bird	Bobolink	*Dolichonyx oryzivorus*	G5	S4B	NHIC; OBBA	In Ontario, bobolink breeds in grasslands or graminoid dominated heyfields with tall vegetation (Gebhauer 2007). Bobolink prefer grassland habitat with a forb component and a moderate litter layer. They have low tolerance for presence of woody vegetation and are sensitive to frequent mowing within the breeding season. They are most abundant in established, but regularly maintained, heyfields, but also breed in lightly grazed pastures, old or fallow fields, cultural meadows and newly planted heyfields. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more forbs (Renfrew et al. 2015).	High - Records of this species in the Study Area and suitable habitat may exist where mature pastures, meadows or heyfields are present.	General Category 1 – Nest and area within 10 m of nest Category 2 – Area between 10 – 80 m of the nest or centre of approximated defended territory Category 3 – Area of continuous suitable habitat between 80 – 300 m of the nest or centre of approximated defended territory	Gebhauer MA. 2007. Bobolink, pp. 566-567 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AT, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p. Renfrew R, Strong AM, Perlut NG, Martin SG, Gavin TA. 2015. Bobolink (Dolichonyx oryzivorus). In The Birds of North America (PG Rodewald, ed.). version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 28 November 2018]. https://doi.org/10.2173/bna.176.
Bird	Canada warbler	*Cardellina canadensis*	G5	S4B	NHIC; OBBA	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	High - Records of this species in the Study Area and suitable habitat may exist where mixed forests or swamps with appropriate structure are present.		McLaren P. 2007. Canada Warbler, pp. 628-629 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AT, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p. Reitsma L, Goodrow M, Hallworth MT, Conway CJ. 2008. Canada Warbler (Cardellina canadensis). In The Birds of North America Online (A. Poole, ed.). version 2.0. Ithaca NY: Cornell Lab of Ornithology; [accessed 28 November 2018]. https://doi.org/10.2173/bna.421.
Bird	Chimney swift	*Chaetura pelagica*	G4G5	S5B	OBBA	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred roosting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary roosting and roosting structure, but other anthropogenic structures and large dens for cavity trees are also used (COSEWIC 2007).	High - Records of this species in the Study Area and suitable habitat may exist in structures with chimneys.	General Category 1 – Human-made roosting, or natural roosting cavity and area within 50 m of natural cavity	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2007. COSEWIC assessment and status report on the Chimney Swift Chaetura pelagica in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 22 November 2018]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_chaetura_pelagica_e.pdf. vii + 48 p.
Bird	Eastern meadowlark	*Sturnella magna*	G5	S4B	NHIC; OBBA	In Ontario, eastern meadowlark breeds in pastures, heyfields, meadows and old fields. Eastern meadowlark prefers moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component (Hull 2018). They prefer well drained sites or slopes, and sites with different cover layers (Roseberry and Klimstra 1970).	High - Records of this species in the Study Area and suitable habitat may exist where mature pastures, meadows or heyfields are present.	General Category 1 – Nest and area within 10 m of the nest Category 2 – Area between 10 – 100 m of the nest or centre of approximated defended territory Category 3 – Area of continuous suitable habitat between 100 – 300 m of the nest or centre of approximated defended territory	Hull SD, Shelfer JA, Lawrence DI. 2018. The effects of management practices on grassland birds: Eastern Meadowlark (Sturnella magna). Jamestown ND: US Geological Survey; [accessed 02 December 2018]. https://pubs.usgs.gov/pp/1842/mw/pp1842MW.pdf. Roseberry JL, Klimstra WD. 1970. The nesting ecology and reproductive performance of the Eastern Meadowlark. The Wilson Bulletin 82(3): 243-267.
Bird	Eastern whip-poor-will	*Antrostomus vociferus*	G5	S4B	OBBA	In Ontario, whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha (COSEWIC 2009). No nest is constructed, and eggs are laid directly on the leaf litter (Mills 2007).	High - Records of this species in the Study Area and suitable habitat may exist where forests with appropriate structure are present.	General Category 1 – Nest and area within 20 m of nest Category 2 – Area between 20-170 m from nest or centre of approximated defended territory Category 3 – Area of suitable habitat within 170-500 m of the nest, or centre of approximated defended territory	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2009. COSEWIC assessment and status report on the Whip-poor-will Caprimulgus vociferus in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2018]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_whip-poor-will_0809_e.pdf. vi + 28 p. Mills A. 2007. Whip-poor-will, pp. 312-313 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.

Taxon	Common Name	Scientific Name	Global Rarity Rank	Provincial Rarity Rank	Source(s)	Ontario Habitat Description	Likelihood of Occurrence	ESA Habitat Protection Provisions[1]	Reference
Bird	Eastern wood-pewee	*Contopus virens*	G5	S4B	OBBA	In Ontario, eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. In younger forests with a relatively dense midstory, it tends to inhabit the edges. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, 1-2 m above the ground, in a wide variety of deciduous and coniferous trees (COSEWIC 2012).	High - Records of this species in the Study Area and suitable habitat may exist where forests with appropriate structure are present.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Eastern Wood-pewee *Contopus virens* in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada. [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Eastern%20Wood-pewee_2013_e.pdf. x + 38 p.
Bird	Evening grosbeak	*Coccothraustes vespertinus*	G5	S4B	OBBA	In Ontario, evening grosbeak breeds across northern Ontario, as far south as southern Georgian Bay, in open mature coniferous or mixed forests dominated by fir species, white spruce and/or trembling aspen (MECP 2016).	High - Records of this species in the Study Area and suitable habitat may exist where coniferous or mixed forests with appropriate species composition are present.		MECP (Ministry of Environment, Conservation and Parks). 2016. Evening Grosbeak. [updated 04 November 2015; accessed 02 December 2019]. https://www.ontario.ca/page/evening-grosbeak
Bird	Least bittern	*Ixobrychus exilis*	G5	S4B	eBird	In Ontario, least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation (Woodliffe 2007). Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency (COSEWIC 2009).	High - 2015 record of this species in suitable habitat (large marshes) at the intersection of Highway 31 and Highway 401. No other suitable habitat is known to be present.	General (as of June 30, 2013)	COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2009. COSEWIC assessment and update status report on the Least Bittern *Ixobrychus exilis* in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada. [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_least_bittern_0809_e.pdf. vi + 36 p. Woodliffe PA. 2007. Least Bittern, pp. 156-157 in Cadman MD, Sutherland DA, Beck GG, Lepage D, Couturier AR, eds. Atlas of the Breeding Birds of Ontario, 2001-2005. Toronto ON: Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. xxii + 706 p.
Bird	Wood thrush	*Hylocichla mustelina*	G4	S4B	NHIC; OBBA	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous understorey and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	High - Records of this species in the Study Area and suitable habitat may exist where deciduous or mixed forests with appropriate structure are present.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. COSEWIC assessment and status report on the Wood Thrush *Hylocichla mustelina* in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada. [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_Wood%20Thrush_2013_e.pdf. ix + 46 p.
Fish	Cutlip minnow	*Exoglossum maxillingua*	G5	S1S2	NHIC	In Ontario, cutlip minnow is found in the St. Lawrence River and its tributaries. Cutlip minnow is a freshwater fish found in small to moderate sized streams and rivers with slower moving water. They prefer clear warm water with substrates representing a combination of gravel, cobble and sand over firm rocky bottom. This fish species is tolerable of cool water but is not a cold-water species (MacVeigh 2013).	High - Records of this species in Study Area and suitable habitat may be present in small to medium watercourses with gravel, cobble or sand over rocky bottoms.	General (as of June 30, 2013)	MacVeigh G. 2013. Recovery Strategy for the Cutlip Minnow (*Exoglossum maxillingua*) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources. [accessed 2019]. https://files.ontario.ca/environment-and-energy/species-at-risk/stars_rec_rs_cltp_minw_en.pdf. 31 p.
Fish	Greater Redhorse	*Moxostoma valenciennesi*	G4	S3	NHIC	In Ontario, greater redhorse are found in the Upper St. Lawrence River, Ottawa River and Tributaries, Lake Champlain tributaries of Lake Ontario, Lake Erie, Lake St. Clair and Huron, north to the Spanish River (Scott 1963; Eakins 2019). Habitat preferences include moderate to swift flowing medium to large rivers with coarse substrates and riffles for spawning, that occurs in late spring early summer at temperatures around 13°C (Eakins 2016, Holm et al. 2010). Cool bottom waters of runs and pools are used as foraging habitats (Holm et al. 2010).	High - Records of this species in Study Area and suitable habitat may be present in medium to large watercourses with coarse substrates.		Burridge M.E. Holm E. Mandrak N.E. 2010. The ROM Field Guide to Freshwater Fishes of Ontario. Toronto, ON: Royal Ontario Museum. 484 p. Eakins R.J. 2019. Ontario Freshwater Fishes Life History Database. [1988-current; accessed 02 December 2019]. http://www.ontariofishes.ca. Scott W.B. 1963. Freshwater Fishes of Eastern Canada. Toronto, ON: University of Toronto Press. 137 p.

Taxon	Common Name	Scientific Name	Global Rarity Rank[1]	Provincial Rarity Rank[1]	Source(s)[2]	Ontario Habitat Descriptions	Likelihood of Occurrence	SAR Habitat Protection Provisions[3]	References
Fish	Lake sturgeon - Great Lakes / Upper St.Lawrence population	*Acipenser fulvescens*	G3G4TNR	S2	NHIC	In Ontario, lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 m in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands (Golder 2011).	Low - the records for this species identified during the desktop assessment appear to be associated with Lake Ontario, not any watercourses within the Study Area.	General	Golder (Golder Associates Ltd). 2011. Recovery Strategy for Lake Sturgeon (Acipenser fulvescens) – Northwestern Ontario, Great Lakes-Upper St. Lawrence River and Southern Hudson Bay-James Bay populations in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://files.ontario.ca/environment-and-energy/species-at-risk/stdprod_086034.pdf. 77 p.
Mammal	Eastern small-footed myotis	*Myotis leibii*	G4	S2S3	BCI	In Ontario, eastern small-footed myotis is not known to roost in trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles, but it occasionally inhabits buildings. Entrances of caves or abandoned mines where humidity is low, and temperatures are cool and sometimes subfreezing may be used as hibernacula (Humphrey 2017).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat may exist where rock piles or accessible buildings are present.	General	Humphrey C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (Myotis leibii) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2019]. https://files.ontario.ca/mnrf_sar_rs_esbn_final_accessible.pdf vii + 76 p.
Mammal	Little brown myotis	*Myotis lucifugus*	G3	S3	BCI	In Ontario, this species' range is extensive and covers much of the province. It will roost in both natural and man-made structures. Roosting colonies require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat exists where treed habitats and accessible buildings are present.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Mammal	Northern myotis	*Myotis septentrionalis*	G1G2	S3	BCI	In Ontario, this species' range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used as hibernacula, but high humidity and stable above freezing temperatures are required (ECCC 2018).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat exists where treed habitats are present.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Mammal	Tri-colored bat	*Perimyotis subflavus*	G2G3	S3?	BCI	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada. They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year (ECCC 2018).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat exists where treed habitats are present.	General	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-TroisChauveSourisThreeBats-v01-2019Nov-Eng.pdf. ix + 172 p.
Reptile	Snapping turtle	*Chelydra serpentina*	G5	S4	NHIC; ORAA	In Ontario, snapping turtle uses a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways (COSEWIC 2008).	High - Records of this species in the Study Area and suitable habitat exists where watercourses and wetlands are present.		COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2008. COSEWIC assessment and status report on the Snapping Turtle Chelydra serpentina in Canada. Ottawa ON: Committee on the Status of Endangered Wildlife in Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/cosewic/sr_snapping_turtle_0808_e.pdf. vii + 47 p.
Vascular Plant	American ginseng	*Panax quinquefolius*	G3G4	S2	Range	In Ontario, American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in well-drained soils of glacier origin that have a neutral pH (ECCC 2018).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat may exist where mature deciduous forests are present.	General Category 1 – Area occupied by American ginseng and area of forest or treed swamp ELC community classes within 100 m of occupied area Category 2 – Area of forest or treed swamp ELC community classes between 100-150 m of occupied area, and contiguous with category 1	ECCC (Environment and Climate Change Canada). 2018. Recovery Strategy for the American Ginseng (Panax quinquefolius) in Canada. Species at Risk Act Recovery Strategy Series. Ottawa ON: Environment and Climate Change Canada; [accessed 02 December 2019]. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/rs_american_ginseng_e_final.pdf. viii + 32 p.

Taxon	Common Name	Scientific Name	Global Rarity Rank[4]	Provincial Rarity Rank[5]	Source(s)	Habitat Needs Description	Likelihood of Occurrence	SAR Habitat Protection Provisions[6]	Reference
Vascular Plant	Black ash	*Fraxinus nigra*	G5	S4	Range	Found throughout Ontario in moist ecosystems; commonly found in northern swampy woodlands (MNRF 2016). This species typically grows on mucky or peaty soils and is considered a facultative wetland species (Reznicek et al. 2011).	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat may exist where deciduous or mixed swamps are present.		MNRF (Ministry of Natural Resources and Forestry). 2016. Black Ash. [modified 18 October 2016; accessed 04 December 2018]. https://www.ontario.ca/page/black-ash Reznicek AA, Voss EG, Walters BS. 2011. Fraxinus nigra. Ann Arbour MI: University of Michigan; [accessed 19 December 2018]. https://michiganflora.net/species.aspx?id=1738.
Vascular Plant	Butternut	*Juglans cinerea*	G4	S2?	NHIC; Range	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	High - Records of this species in the Study Area and suitable habitat may exist wherever trees are present.	General (as of June 30, 2013)	Farrar JL. 1995. Trees in Canada. Markham, ON: Fitzhenry & Whiteside Limited and Ottawa, ON: Canadian Forest Service, Natural Resources Canada. 502 p. Voss EG, Reznicek AA. 2012. Field Manual of Michigan Flora. Ann Arbour MI: University of Michigan Press. 880 p.
Vascular Plant	Eastern prairie fringed-orchid	*Platanthera leucophaea*	G2G3	S2	Range	In Ontario, eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins (Eastern Prairie Fringed-orchid Recovery Team 2010). This species is found only in southern Ontario, and only two locations are currently known on sand spits along the shore of Lake Erie.	Moderate - No records of this species in the Study Area, however; the Study Area lies within the range of this species and suitable habitat may exist where fens, bogs or wet meadows are present.	Regulated In the geographic areas of: the City of Ottawa; Counties of Bruce, Essex, Grey, Lambton, Lanark, Lennox and Addington, and Simcoe; Municipality of Chatham-Kent; Regional Municipality of York; and United Counties of Leeds and Grenville, and United Counties of Stormont, Dundas and Glengarry. Regulated Habitat: • fens, tallgrass prairies, and moist old fields	Eastern Prairie Fringed-orchid Recovery Team. 2010. Recovery strategy for the Eastern Prairie Fringed-orchid (Platanthera leucophaea) in Ontario. Ontario Recovery Strategy Series. Peterborough ON: Ontario Ministry of Natural Resources; [accessed 02 December 2018]. https://www.ontario.ca/page/eastern-prairie-fringed-orchid-recovery-strategy. vi + 30 p.
Vascular Plant	Lakecress	*Rorippa aquatica*	G4?	S3?	NHIC	In Ontario, lakecress is an aquatic plant of lakes and rivers (Oldham and Brinker 2009).	High - Records of this species in the Study Area and suitable habitat may exist in lakes and rivers.		Oldham MJ, Brinker SR. 2009. Rare Vascular Plants of Ontario. 4th ed. Peterborough, ON: Natural Heritage Information Centre, Ontario Ministry of Natural Resources. 168 p.
Vascular Plant	Linear's tail	*Saururus cernuus*	G5	S3	NHIC	In Ontario, linear's tail grows in low wet woodlands and in the riparian zone and shallow waters of streams and rivers (Oldham and Brinker 2009).	High - Records of this species in the Study Area and suitable habitat may exist where low wet woodlands and adjacent shallow streams or rivers are present.		Oldham MJ, Brinker SR. 2009. Rare Vascular Plants of Ontario. 4th ed. Peterborough, ON: Natural Heritage Information Centre, Ontario Ministry of Natural Resources. 168 p.
Vascular Plant	Smith's bulrush	*Schoenoplectiella smithii*	G5?	S2S3	NHIC	In Ontario, Smith's bulrush grows in moist, sandy or muddy shorelines or beaches with large water fluctuations (FNA 2007).	High - Records of this species in the Study Area and suitable habitat may exist where sandy or muddy shorelines with large water fluctuations are present.		FNA (Flora of North America). 2007. Schoenoplectus smithii. Flora of North America. Vol. 27, Bryophyta: Mosses, part 1. New York NY: Oxford University Press; [accessed 21 December 2018]. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357048.

Notes:

[1] *Endangered Species Act* (ESA), 2007. General (O.Reg 242/08 last amended 29 June 2020 as O.Reg 226/20). Species at Risk in Ontario List (O.Reg 230/08 last amended 1 Aug 2016 as O. Reg 404/16, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

[2] *Species at Risk Act* (SARA), 2002. Schedule 1 (Last amended 23 April 2021); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

[3] Committee on the Status of Endangered Wildlife in Canada (COSEWIC) http://www.cosewic.gc.ca/

[4] Global Ranks (GRANK) are Rarity Ranks assigned to a species based on their range-wide status. GRANKS are assigned by a group of consensus of Conservation Data Centres (CDCs), scientific experts and the Nature Conservancy. These ranks are not legal designations. G1 (Extremely Rare), G2 (Very Rare), G3 (Rare to uncommon), G4 (Common), G5 (Very Common), GH (Historic, no record in last 20yrs), GU (Status uncertain), GX (Globally extinct), ? (Inexact number rank), G? (Unranked), Q (Questionable), T (rank applies to subspecies or variety). Last accessed August 2011

[5] Provincial Ranks (SRANK) are Rarity Ranks assigned to a species or ecological communities, by the Natural Heritage Information Centre (NHIC). These ranks are not legal designations. SRANKS are evaluated by NHIC on a continual basis and updated lists produced annually. SX (Presumed Extirpated), SH (Possibly Extirpated - Historical), S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not Applicable), S#S# (Range Rank), S? (Not ranked yet), SAB (Breeding Accident), SAN (Non-breeding Accident), SX (Apparently Extirpated). Last accessed November 2018.

[6] General Habitat Protection is applied when a species is newly listed as endangered or threatened on the SARO list under the ESA, 2007. The definition of general habitat applies to areas that a species currently depends on. These areas may include dens and nests, wetlands, forests and other areas essential for breeding, rearing, feeding, hibernation and migration. General habitat protection will also apply to all listed endangered or threatened species without a species-specific habitat regulation as of June 30, 2013 (ESA 2007, c.6, s.10 (2)). Regulated Habitat is species-specific habitat used as the legal description of that species habitat. Once a species-specific habitat regulation is

"NHIC (Natural Heritage Information Centre); OBBA (Ontario Breeding Bird Atlas); ORAA (Reptiles and Amphibians of Ontario); OAA (Odonate Atlas of Ontario); BCI (Bat Conservation International); atlas (Audubon Society)

'—' No status

ATTACHMENT B

Reptile and Amphibian Exclusion Fencing

SPECIES AT RISK BRANCH
BEST PRACTICES TECHNICAL NOTE

REPTILE AND AMPHIBIAN EXCLUSION FENCING

Version 1.1

July 2013

Ministry of Natural Resources

Ontario

July 2013

Ontario Ministry of Natural Resources
Species at Risk Branch

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Cover illustration: Photograph by Matthew J. Aresco, Conservation Director, Nokuse Plantation

Before an activity can be initiated, permissions, approvals or authorizations may be required from MNR (e.g. Endangered Species Act authorization, Wildlife Scientific Collector's Authorization) or other agencies, levels of government (e.g. a conservation authority, municipality, federal or provincial government), or landowners. It is your responsibility to ensure that all necessary permissions, approvals and authorizations are acquired prior to proceeding with your activity.

This document presents information as of the point in time of publication and is meant to be updated through time as improved information becomes available.

Cette publication hautement spécialisée, Reptile and Amphibian Exclusion Fencing Best Practices n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec le ministère des Richesses naturelles au Pamela Wesley,705-755-5217.

Document History

Revision Number	Revision Date	Summary of Changes	Originated	Reviewed	Authorized
1.1	June, 2013	Pre-publishing edits	June, 2013	June, 2013	June, 2013

REPTILE AND AMPHIBIAN EXCLUSION FENCING - BEST PRACTICES -

The purpose of this guidance document is to provide an overview of proven design and installation techniques for reptile and amphibian exclusion fencing. Though this document points to site and species-specific design requirements, it is important to recognize that every situation is different. This guidance is not meant to replace site-specific advice obtained from local MNR staff or experienced exclusion fencing contractors. Moreover, exclusion fences are only effective when well planned, properly constructed, and maintained.

Exclusion fencing seeks to eliminate access to specific areas where activities that could harm animals are occurring (e.g. active aggregate operations, construction sites, and roads). The selection and installation of exclusion fencing can present some challenges, particularly if multiple species are being excluded. For example, some reptiles and amphibians are able to dig under fencing while others can climb over. Some may also take advantage of burrows dug by other animals. To maintain effectiveness, the bottom of the fence should be buried or secured firmly to the ground and minimum height recommendations (Table 1) are considered.

Exclusion fence design should consider the target species as well as those that might be unintentionally impacted. Fencing material should not pose a risk of entanglement or permit individuals to pass underneath or between openings. Landscape features such as topography and substrate need to be considered as they may constrain fencing design.

Including plans for fencing in advance of a project can increase efficiency and fence effectiveness. For example, long-term road projects that will include a permanent sound barrier could design the sound barrier such that it also meets the specifications of the required exclusion fence.

EFFECTIVE FENCE CHARACTERISTICS

The fence burial and height recommendations listed in Table 1 below have been compiled from scientific literature, established management practices, and practitioner best advice. These are general recommendations and at times other specifications may be more appropriate. For instance, in areas where the substrate does not permit fence burial, weighing down the fence with heavy items (e.g. sand bags) or backfilling may be acceptable. Where needed, speak with your local MNR staff or experienced exclusion fencing contractor to develop site-specific plans.

If multiple species are being excluded from the same area, and the species-specific fencing specifications differ, the uppermost minimum height and greatest depth recommendation should be used (Table 1). If you are excluding both Blanding's Turtle and Gray Ratsnake, for example, the exclusion fence should be a minimum of 2 m tall (see Gray Ratsnake section below for additional details).

Exclusion fences should be installed prior to emergence from hibernation. A survey of the enclosed/secluded area should be conducted immediately following fence installation to ensure that no individuals have been trapped on the wrong side of the fence.

Table 1. Recommended burial depth and height requirements of exclusion fencing for reptiles and amphibians. Recommended height is the height of the fence after it has been installed including the buried components and any installed overhangs or extended lips.

SPECIES	RECOMMENDED DEPTH OF FENCE BURIED (cm) *	RECOMMENDED HEIGHT OF FENCE (cm) **
Turtles – general	10 – 20	60
Eastern Musk Turtle, Wood Turtle	10 – 20	50
Massasauga, Eastern Hog-nosed Snake, Butler's Gartersnake, Queensnake	10 – 20	60
Gray Ratsnake & Eastern Foxsnake	10 – 20	200
Fowler's Toad	10 – 20	50
Snakes - general	10 – 20	100
Common Five-lined Skink	10 – 20	unknown
Salamanders	10 – 20	30

*** does not include the 10 cm horizontal lip that should extend outward an additional 10 – 20 cm (see Figure 2)**
**** the height of fencing has been provided as an approximate. Fencing materials may in fact not be available in proportions that would allow for these precise measurements. It is most effective, if the height and burial depth recommendations are met.**

DURATION OF ACTIVITIES & DEGREE OF ANTICIPATED DISTURBANCE

The type of disturbance, the proximity to disturbance, and the planned fence longevity are factors that influence which type of exclusion fence is most effective. For short-term activities (i.e. 1 to 6 months) such as minor road repairs, a light-duty geotextile fence is appropriate. Longer term or permanent fencing projects, however, require more durable materials such as – heavy-duty geotextile, wood, concrete, woven-wire, sheet metal, vinyl panels, or galvanized mesh.

GEOTEXTILE FENCES

Geotextile fences (e.g. silt fences) come in many types and qualities. They can be very effective for the temporary exclusion of reptiles and amphibians. For the purposes of this document, temporary use ranges from a few months up to 2-3 years. Winter weather is generally damaging to geotextile materials and the cost of maintenance over the long-term should be considered during the planning phase. Depending upon the quality, geotextile can be resistant to UV degradation and the bio-chemical soil environment.

Light-duty Geotextile Fencing:

Light-duty geotextile fencing is made of nylon material and is typically purchased with wooden stakes pre-attached at 2 m to 3 m intervals (Plate 1). It can also come without pre-attached stakes. Light-duty geotextiles are largely intended for projects with shorter durations of only a few months in duration and up to one season.

Geotextile fencing with nylon mesh lining should be avoided due to the risk of entanglement by snakes.

To use light-duty geotextile fencing:

- Fencing fabric is effective if attached to wooden, heavy plastic or metal stakes using heavy-duty wire staples or tie-wire (Figure 2).
- Secure the fence on posts that are placed at 2 m to 3 m apart. If using the greater recommended distance between posts, additional maintenance may be required to maintain effectiveness.
- Securely drive the stakes into the ground to a recommended depth of 30 cm. The fencing fabric should be buried to the recommended specifications in Table 1 and back-filled with soil.
- For snakes, supporting posts should be staked on the activity side (e.g. on the side facing the aggregate stock pile or the road - Figure 2).
- Light-duty geotextile fences are not effective where rocks or other hard surfaces prevent proper anchoring of fence posts and burial of the fence fabric.
- Light-duty geotextile fences are not effective where a large amount of concentrated run-off is likely or to cross streams, ditches or waterways without specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice and recommendations.
- See general best practices section below for additional details.

Generally, light-duty geotextile fences are not effective if they exceed 1 metre in height unless purposely manufactured for greater height (e.g. stakes placed at closer intervals or cross braces). If greater height is required consider using heavy duty geotextile, hardware cloth or other fencing materials.

Plate 1. Light-duty geotextile fencing with pre-attached wooden stakes used to exclude turtles from a road as seen on a regular maintenance check (photo credit: Brad Steinberg).

Heavy-duty Geotextile Fencing:

Heavy-duty geotextile fencing is typically constructed of a thick felt-like fabric. It may also be called 'double row' or 'trenched' fencing. For support, this fencing uses a woven wire fence (e.g. chain link) or some other structure (Plate 2). It is recommended that a minimum density of 270R or equivalent woven geotextile fabric is used.

Heavy-duty geotextile material can be effective for up to 2 or 3 years with proper maintenance. This type of fencing can be damaged by small mammals chewing through or torn by heavy debris (e.g. tree branches). Therefore, it may be best suited to turtles, which are less likely to take advantage of holes or tears in the fabric. If

used to exclude snakes or other animals, more maintenance may be required.

Heavy-duty geotextile fencing:

- The wire fence should be installed on the activity side to prevent animals from leveraging and climbing into the exclusion area while allowing the animal to escape if they find themselves on the wrong side (Figure 2).
- Geotextile fences across streams, ditches or waterways should have case-specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice.
- See light-duty geotextile section above and general best practices below for additional details.

Plate 2. Example of a heavy-duty geotextile fencing used to exclude snake species (photo credit: Jeremy Rouse).

HARDWARE CLOTH FENCES

Hardware cloth (also known as galvanized mesh or Birdscreen) is durable, cost effective and useful for excluding reptiles and amphibians. The fence should be made of heavy galvanized hardware cloth with a ¼ inch mesh. For fences intended to exclude small snakes, a ⅛ inch mesh may be more effective. In contrast, fencing intended to exclude turtle species can have a larger mesh size (e.g. ½ inch). Larger mesh may have a longer lifespan as it is constructed from a thicker material compared to smaller mesh sizes.

To use hardware cloth fencing:

- Secure the fence on posts placed a recommended 2.5 m apart with the stakes on the activity side (Figure 2).
- Pull the mesh taught and staple or secure with screws and a metal stripping to prevent the mesh from being ripped when pressure is applied.
- Installing a top rail or folding the mesh over a taut smooth wire reduces tearing (Plates 3 and 4).
- An outward facing lip installed on the species side ensures that snakes and amphibians are unable to climb or jump over the fence (Figure 2; Plate 4)
- Tears can be mended with 18-gauge galvanized wire.
- See general best practices section below for additional details.

Plate 3. Example of a galvanized mesh fencing used for the long-term exclusion of snakes and turtles from the adjacent highway (photo credit: Megan Bonenfant).

Plate 4. Long-term to permanent exclusion fencing using galvanized mesh with over-hanging lip to prevent animals from climbing or jumping over (photo credit: Megan Bonenfant).

WOOD LATH SNOW FENCING

In certain circumstances, wood lath snow fencing can be effective at excluding turtles. This fencing is typically constructed from soft wood slats that have been woven together with 13-gauge wire and is then attached to steel fence posts which have been driven into the ground.

Wood lath fencing is cost effective and can easily be laid down during the winter to prevent damage. The durability of the material, however, is not meant for very long-term use (e.g. more than 3 years), unless regular maintenance occurs.

To use wood lath snow fencing:

- The fencing should be attached to heavy plastic or metal stakes using heavy-duty wire staples or tie-wire.
- The stakes are recommended to be placed at 2 to 3 m intervals and securely driven into the ground 30 cm or more.
- Wood lath snow fencing across streams, ditches or waterways should have case-specific modifications.
- Wood lath snow fencing lends itself well to being combined with other types of material to ensure complete exclusion.
- See general best practices section below for additional details.

Plate 5. Example of a wood lath snow fencing used to exclude turtles (photo credit: Karine Beriault).

EXCLUSION FENCING FOR GRAY RATSNAKE AND EASTERN FOXSNAKE

Gray Ratsnake and Eastern Foxsnake are the largest snakes in Ontario - reaching nearly 2 m in length. They are also excellent climbers. For this reason, fencing intended to exclude either of these species has additional recommended design specifications.

- The fence should be at least 2 m high.
- The material on the species side (Figure 2) should be smooth to prevent the snakes from climbing into the excluded area.
- Stakes should be on the activity side of the fence (Figure 2).
- Due to the increase in fence height, it is valuable to decrease the distance between posts or install diagonal braces.
- See general best practices section below for additional details.

CONCRETE, SHEET METAL & VINYL WALLS

Concrete, metal or vinyl walls can stand alone or be combined with woven wire or chain link fences. They are durable, require minimal maintenance and are effective in excluding target species from high risk areas and guiding them to crossing structures or other desired locations (Plates 6 and 7). This fence type is comprised of a continuous vertical face of concrete, metal or vinyl sheeting with no gaps. Concrete walls can be installed as either pre-cast sections or pour directly in place.

Plate 6. Stand-alone continuous concrete wall used to exclude salamander species installed as pre-cast forms (photo credit: Steven Roorda).

Plate 7. Pre-formed vinyl sheeting fence intended to exclude salamanders for a construction site (photo credit: Herpetosure Ltd.)

The wall height depends upon the target species, but they are usually between 45 and 60 cm tall and buried 25 cm. Concrete, metal or vinyl exclusion fencing is most appropriate for salamanders, skinks, small snakes, and small turtles. For large turtle species, a chain link fence can be installed directly on top of the concrete wall for complete exclusion.

HABITAT CONNECTIVITY

Habitat connectivity is the connectedness between patches of suitable habitat or the degree to which the landscape facilitates animal movement. Exclusion fencing installed along roads or other large projects can effectively reduce or eliminate habitat connectivity for animals. In these scenarios, exclusion fencing should be considered with eco-passages in order to maintain connectivity. Fencing in isolation should be viewed as a temporary method to reduce mortality until species movement can be restored. Where eco-passages are not feasible they should be identified for consideration with any future road work or development to improve connectivity.

During the installation of fencing with an eco-passage, it is important that the fencing sits flush with the passage to ensure that

there are no gaps where animals can squeeze through.

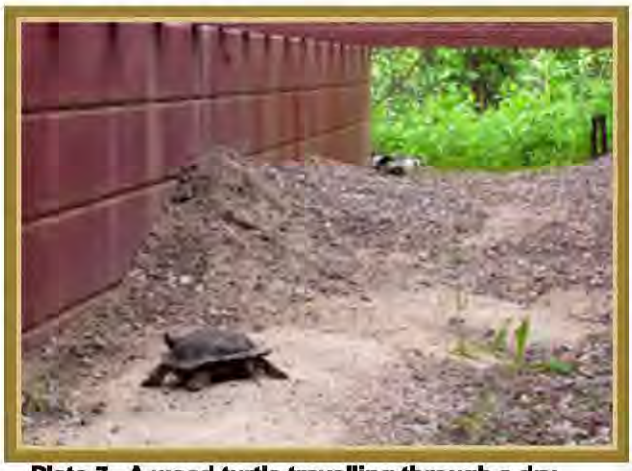

Plate 7. A wood turtle travelling through a dry eco-passage. Ecopassages such as this help to ensure the long-term connectivity of seasonal habitat for this and other reptile and amphibian species (photo credit: Amy Mui).

GENERAL BEST PRACTICES:

- To deter digging, bury the fence 10 cm down with an additional 10 cm horizontal lip (Figure 2).
- Backfill and compact soil along the entire length on both sides of the fence (Figure 2).
- Once the fence is installed, a survey should be done to ensure that no individuals have been trapped inside (speak with MNR for survey advice).
- Exclusion fencing intended to exclude snakes should have the stakes installed on the activity side (opposite the normal requirement for sediment control fencing) to prevent snakes from using the stakes to maneuver over the fencing.
- For snakes and toads, the fence should have an overhanging lip on the species side (Figure 2).
- Fences should be inspected after spring thaw and at regular intervals throughout the active season, especially following heavy rain events. This is particularly important for geotextile fences. Any damage that affects the integrity of the fence (e.g. tears, loose edges, collapses, etc.) should be fixed promptly.
- Tall or woody vegetation on the species side of the fence should be managed if there is a risk that it may enable the animals to climb over. This is most important during spring and fall. Proceed cautiously to not harm animals protected plant species during vegetation removal.
- When installing an eco-passage, fencing or exclusion walls should be used as a guiding system to direct animals to passage openings.
- Natural screens such as trees or shrubs can help to reduce road access and can be combined with fencing to provide protection of individuals from predation.
- Install fences with a turn-around at the ends furthest from the wetland habitat and at any access areas to assist in redirecting animals away from any fence openings (Figure 1).
- Curving the ends of the fencing inward (i.e. away from the road or construction site) may help to reduce access to these locations. The ends may also be tied off to natural features on the landscape such as trees or rock cuts.

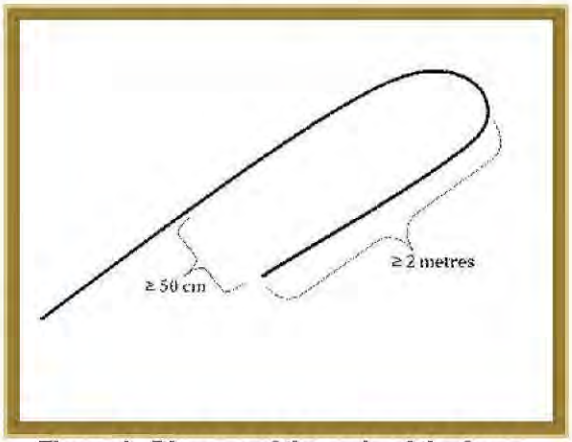

Figure 1. Diagram of the ends of the fence designed to curve inward in order to direct animals away from the area of exclusion.

WATER MOVEMENT & DRAINAGE

- In areas where surface water run-off may erode a soil-based backfill, consider using rocks or sand bags. Ensure these materials cannot be used by animals to climb over the fence.
- Where possible, minimize the number of water crossings: when necessary, it should occur where flow is minimal.
- Fence posts in waterways or areas prone to seasonal flooding should be driven rather than dug – unless following established best practices.
- Fencing should be placed above the high water mark anticipated for high water events such as spring freshet or periods of heavy or continuous rainfall.

TOPOGRAPHY:

- Fence posts should be closer together in undulating topography.
- Fences installed on slopes have a different effective height depending upon whether the animal will be approaching from the up or down slope. The fence height can be adjusted accordingly.

Improvements or questions regarding exclusion fencing can be brought to the local MNR Species at Risk Biologist or other MNR staff.

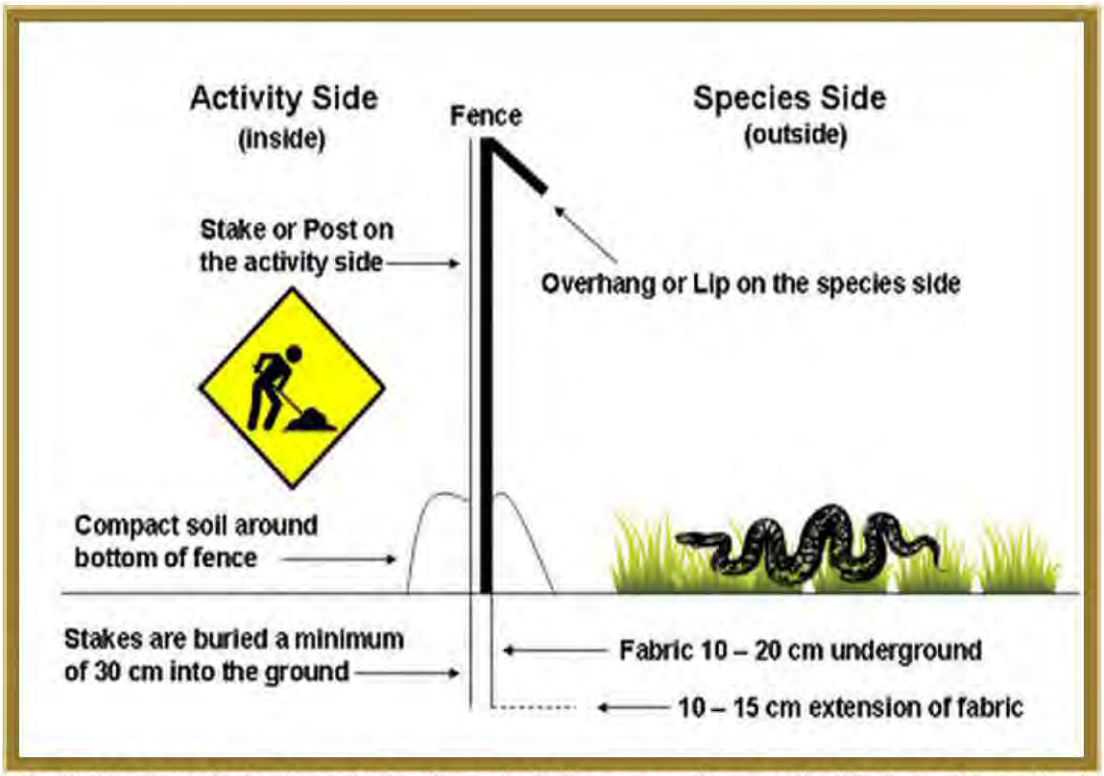

Figure 1. A side view of a basic exclusion fence including an overhang or flexible lip to deter animals from climbing or jumping over the fence. Placement of the stake on the Activity Side or on the inside of excluded area is also illustrated. This is particularly important for snake species which may use the stakes to maneuver over the fence.

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For additional information:

Visit the species at risk website at
ontario.ca/speciesatrisk
Contact your MNR district office
Contact the Natural Resources Information Centre
1-800-667-1940
TTY 1-866-686-6072
mnr.nric.mnr@ontario.ca
ontario.ca/mnr

GOLDER
MEMBER OF WSP

ORIGINAL REPORT

Stage 1 Archaeological Assessment

North Dundas Drinking Water Supply System Expansion, Various Lots and Concession, Geographic Townships of Winchester and Williamsburgh, United Counties of Stormont, Dundas, and Glengarry

Licensee: Aaron Mior, M.M.A. (P1077)
PIF Number: P1077-0066-2021

Submitted to:

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September 29, 2022

Distribution List

1 e-copy - J.L. Richards & Associates Limited

1 e-copy - Ministry of Heritage, Sport, Tourism, and Culture Industries

1 e-copy - Golder Associates Ltd.

Executive Summary

The Executive Summary highlights key points from the report only; for complete information and findings, as well as the limitations, the reader should examine the complete report.

Golder Associates Ltd. (Golder) was retained by J.L. Richards & Associates Limited (JLR) to complete a Stage 1 archaeological assessment in support of the Municipal Class EA for the North Dundas Drinking Water Supply System Expansion within the Geographic Townships of Winchester and Williamsburgh, United Counties of Stormont, Dundas, and Glengarry. The study area includes a 24 km corridor following Stormont, Dundas and Glengarry County Road 31 between Morrisburg and Winchester and a proposed 5-acre well site located west of Lafleur Road (Maps 1 and 2).

The objectives of the Stage 1 archaeological assessment are defined in the Ontario Ministry of Heritage, Sport, Tourism, and Culture Industries' (MHSTCI) *Standards and Guidelines for Consultant Archaeologists* (2011), and include background contextual research to evaluate archaeological potential and to provide appropriate recommendations and site specific strategies if additional assessment is required.

Evidence for human occupation of eastern Ontario dates to at least 11,000 years before present (BP) following the retreat of the Champlain Sea. During the succeeding Archaic Period (10,000 BP to 2,800 BP), the environment of eastern Ontario approached modern conditions with the Ottawa River and its many tributaries including the South Nation River serving as a major transportation route that facilitated trade in copper mined from surface deposits near Lake Superior. The Woodland Period (2,800 BP to 450 BP) saw the introduction of pottery and agriculture, which led to the development of semi-permanent and permanent villages in southern Ontario. Within eastern Ontario, Woodland Period subsistence strategies were still primarily based on hunting and gathering and their migratory routes followed seasonal patterns to known hunting locations. European contact with local Indigenous Communities began around 1610 following the expedition of French explorer Étienne Brûlé who passed through the Ottawa Valley. Within Winchester and Williamsburg Townships, European settlement did not begin until the early 19th century. County Road 31, which the majority of the study area follows, was formerly Highway 31 and was established in 1927. The proposed location of the well was agricultural field up until it became a sand pit in the later half of the 20th century.

A visual inspection of the study area was conducted on October 22, 2021. The proposed well site located west of Lafleur Road has been almost entirely disturbed by the use of the property as a sand pit. A small strip of land between Lafleur Road and the pre-existing sand pit appears to have not been disturbed and has retained archaeological potential. Large portions of the proposed watermain corridor have been disturbed by the existing roadways, drainage ditches, or development. Nonetheless, portions of the right-of-ways that do not appear to have been subject to significant ground disturbance may retain archaeological potential.

Most significantly, the study area passes through the Beckstead Site (BfFt-1), a registered archaeological site and an Indigenous village dating to the Woodland Period (2,800 to 450 BP). Excavations at the Beckstead Site uncovered portions of four long houses and several human burials, although the site has only been subject to partial excavation and therefore the boundaries of this site have not been archaeologically confirmed. The site retains Cultural Heritage Value or Interest and there is a high potential for additional Indigenous archaeological resources within its vicinity. The Beckstead Site (BfFt-1) is a significant archaeological site that is undoubtably of special interest to local First Nation communities. Any impact to the site has the potential of disturbing human remains.

This Stage 1 archaeological assessment has resulted in the following recommendations:

1) The Beckstead Site (BfFt-1) should be avoided and protected to prevent impact from potential landscape disturbances associated with the project. Should avoidance and protection not be possible, the Beckstead Site should be subject to Stage 3 site-specific assessment and Stage 4 mitigation of development impacts. The Stage 3 site specific assessment should involve the hand excavation of 1 m x 1 m test units at 5 m intervals in order to define the limits of the site and to develop an appropriate Stage 4 mitigation strategy. Based on the available information, intact portions of the Beckstead Site likely exist underneath County Road 31 and should any ground disturbance occur under the road in the vicinity of the site (See Maps SD1 and SD2 of the supplementary documentation), modern layers located above intact natural soils should be mechanically excavated under the supervision of a licensed archaeologist so that the intact natural soils can be subject to Stage 3 hand excavation prior to any development impacts.

2) Registered archaeological Site (BfFt-10) is considered to possess Cultural Heritage Value to Interest. Should any impacts occur within 70 m of the site, archaeological monitoring may be required.

3) Due to the presence of the Beckstead Site (BfFt-1) within the study area, a Woodland Period Indigenous village, and registered site BfFt-10, representing an Indigenous occupation location pre-dating European contact, local Indigenous communities should be engaged in the project and consulted prior to any decisions regarding impact to the site. The Beckstead Site is a significant archaeological site known to contain human burials and has high cultural value or interest.

4) Given the location of a historic cemetery adjacent to County Road 31, and that the exact boundaries of the potential burials are currently unconfirmed (i.e., the potential for unmarked burials), further Stage 3 investigation will be necessary to confirm whether the cemetery extends into the study area. This will entail the use of a smooth-bucket backhoe or Gradall to strip topsoil following the length of the cemetery limits, within a width of 10 m, along the boundary that falls within the cemetery limits. Once the subsoil is exposed, if it has been determined that no burial shafts fall within the limits of construction, the topsoil will be returned and all excavated areas filled in. Should burial deposits be encountered, the MHSTCI and the BAO must be contacted immediately.

5) Portions of the study area identified as having archaeological potential as shown on Map 10 should undergo Stage 2 test pit survey at 5 m intervals prior to any development impacts.

6) Portions of the study area identified as sloped, disturbed, or permanently wet have low or no archaeological potential and require no additional archaeological assessment.

7) Should the study area expand beyond the area shown on Map 10, additional archaeological assessment may be required.

This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c. 0.18. The report is reviewed to ensure that the licensed consultant archaeologist has met the terms and conditions of their archaeological license, and that the archaeological field work and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario.

Project Personnel

Project Manager	Brian Henderson, M.A.Sc., P.Eng.
Project Director	Paul Smolkin, P.Eng.
Senior Review	Aaron Mior, M.MA. (P1077), Senior Archaeologist
Licensee	Aaron Mior, M.MA. (P1077), Senior Archaeologist
Site Inspection	Randy Hahn, Ph.D. (P1107), Staff Archaeologist
Report Preparation	Randy Hahn, Ph.D. (P1107), Staff Archaeologist
	Aaron Mior, M.MA. (P1077), Senior Archaeologist
GIS/Mapping	Bojan Radojevic, B.A.
Administration	Courtney Adey

Abbreviations

ASDB	Archaeological Site Database maintained by MHSTCI
BAO	Bereavement Authority of Ontario
BP	Before Present, taken to mean before 1950 and used as an alternative to BC/AD
CHVI	Cultural Heritage Value or Interest
Golder	Golder Associates Ltd.
m	Metre(s)
km	Kilometre(s)
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
PIF	Project Information Form

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1.0 PROJECT CONTEXT

1.1 Development Context

Golder Associates Ltd. (Golder) was retained by J.L. Richards & Associates Limited (JLR) to complete a Stage 1 archaeological assessment in support of the Municipal Class EA for the North Dundas Drinking Water Supply System Expansion, located in the Geographic Townships of Winchester and Williamsburgh, United Counties of Stormont, Dundas, and Glengarry. The study area consists of an approximately 24 km corridor following Stormont, Dundas and Glengarry County Road 31 between Morrisburg and Winchester, Ontario, and a proposed 5-acre well site located west of Lafleur Road (Maps 1 and 2).

Permission to enter the proposed well site west of Lafleur Road was provided by the client. The portion of the study area for the watermain corridor follows public right-of-ways and required no special permission to access.

1.2 Objectives

The objectives of this Stage 1 archaeological assessment follow the MHSTCI *Standards and Guidelines for Consultant Archaeologists* (2011, p. 13):

- To provide information about the study area's geography, history, previous archaeological fieldwork and current land conditions;
- To evaluate in detail the study area's archaeological potential, which will support recommendations for additional archaeological survey for all or parts of the property; and,
- To recommend appropriate strategies for Stage 2 survey, if applicable.

2.0 HISTORICAL CONTEXT

The following historical narrative is intended to provide a general overview of the interpreted land use during the "Pre-Contact Period" and "Early Contact Period" within the vicinity of the current study area. This historical overview is based on archaeological and historical interpretations inferred over the past 100 years, and generally reflect inferences and interpretations made by non-Indigenous representatives. The text below is not intended to provide a comprehensive historical overview of the occupation and landscape prior to, and following the arrival of Europeans to the modern-day area of eastern Ontario, but rather provide a general overview context that can be referenced when determining the potential for archaeological resources within the current project study area.

The text and comments below, including the cited references, may reflect archaeological literature within general publications, but are not suggested to represent the opinions of those Indigenous communities whose history it is purported to reflect.

2.1 Regional Indigenous History

Eastern Ontario was covered by the Laurentide ice sheet until approximately 11,000 years before present (BP). Following the period of deglaciation, eastern Ontario was inundated by the Champlain Sea which is interpreted to have extended from the Rideau Lakes in the south, along the Ottawa Valley and St. Lawrence areas and terminating in the vicinity of Petawawa in the west. The exact western boundary is unconfirmed as current elevation levels reflect the isostatic adjustment of the land following the melting of the glaciers which has obscured definitive traces of the Champlain Sea shoreline at the time of its existence. The eastern portion of the sea extended into the Atlantic Ocean.

During much of the Paleo Period (11,000 to 10,000 BP), eastern Ontario would have remained inundated by the Champlain Sea, although as the Champlain Sea receded towards the end of this period it is possible that people migrated along the changing waterfront landscape eventually moving into the area (Watson 1999a).

The ridges and old shorelines of the Champlain Sea and early Ottawa River channels generally represent areas most likely to contain evidence of Paleo Period occupation in this region, however identifying the location and dates of these ancient shorelines has proved challenging. The boundaries of the Champlain Sea are not marked by a continuous identifiable shoreline, especially along the western shore where rocky conditions were not favorable to the formation of beaches (Chapman and Putnam 1973). Attempts to use deposits of marine mollusk shells as a source for radiocarbon dates to delineate the transgression of the shorelines have proved unreliable as shells absorb carbon at different rates according to their depth below the surface and geological location (Robinson 2012). Additionally, earlier interpretations showing discrete stages of regression (see Chapman 1937) have proven not to be supported by the geological record. Unlike the catastrophic flood events during the Younger Dryas climatic event that led to the rapid formation of the Champlain Sea, its regression was a slow process occurring as sea waters drained during isostatic rebound (Robinson 2012). The interpretation of the presence of shorelines is further complicated by the fact that isostatic rebound may have raised the general study area above its current elevation before it receded to its current level (Fulton and Richard 1987). Flooding resulting from the overflow of glacial Lake Agassiz also eroded and manipulated topographic landforms within the evolving landscape (Fulton et al. 1987). As a consequence, only the margins of the Champlain Sea at its maximum extent, a time when most of eastern Ontario would have been fully submerged, have been reliably mapped due to the rapid inundation creating pronounced shoreline features (Loring 1980). Although recent studies using various dating techniques that do not rely upon deposits of mollusk shells have provided some favourable results (Tremblay 2008), considerable work remains in developing the chronology of the Champlain Sea's regression.

The earliest possible settlement in the Ottawa Valley and surrounding area would have occurred during the recession of the Champlain Sea when the vegetation and wildlife began to develop within the area, which enabled the sustainability of humans (Watson 1999a). The ridges and old shorelines of the Champlain Sea and early river channels reflect areas most likely to contain evidence of Paleo Period occupation in the region. Archaeological and geological investigations in the Ottawa Valley have suggested these early sites may be identified within the 550 foot (167.6 m) or higher contour topography, although additional research may be required to confidently assess this correlation (Kennedy 1976).

Evidence of human occupation during this period has been documented by a variety of archaeological discoveries including fluted points (laurel leaf shaped points with a channel flake scar extending from the base of the point) recorded in the Rideau Lakes area (Watson 1982; 1999b). Although very few Paleo Period sites have been documented in eastern Ontario, discoveries in the Ottawa area, including sites interpreted to have produced Paleo Period material near Greenbank Road (Swayze 2003), Albion Road and Rideau Road (Swayze 2004), suggests evidence of early occupation although the lack of diagnostic material represented at these sites and the inferred climatic environment suggests these sites may rather be reflective of Archaic Period occupation following the recession of the Champlain Sea. No Paleo Period sites have been registered within Winchester or Williamsburgh Townships (MHSTCI 2021).

During the succeeding Archaic Period (ca. 10,000 to 2,800 BP), the environment of eastern Ontario approached modern conditions (Ellis et al. 1990). Occupation within the Ottawa Valley and the surrounding area developed as the environment became habitable, with an Early Archaic Dovetail projectile point recovered in Ottawa South sometime around 1918-1920 (Pilon and Fox 2015) potentially representing the earliest diagnostic evidence of humans in the area.

Archaic Period inhabitants generally continued to employ a hunter-gatherer subsistence strategy focused on localized faunal and floral resources including deer, fish, berries and nuts. The McIntyre Site, located on the north shore of Rice Lake and south of Peterborough, contained the remains of a large variety of floral and faunal species and reflects the diversity of subsistence resources available during this period (Ellis et al. 1990). Plant remains recovered from the McIntyre site included butternut, acorn, hickory, plum, cherry, blueberry and hawthorn, and provides evidence of the diversity in subsistence. Faunal remains included deer, canine, beaver, muskrat, bear, and a large variety of fish including bass, bullheads, and suckers. The inhabitants of the site may also have been gathering wild rice (McAndrews 1984). In the Ottawa Valley, a stone fish weir likely dating to the Archaic Period found upstream from Morrison Island and Allumette Island demonstrates the increasingly sophisticated technology that was being employed during the period and the developing reliance on fish and aquatic species within the temporal subsistence strategy (Allen 2010).

The St. Lawrence and Ottawa Rivers, as well as their tributary waterways, were important routes for the movement of natural copper, either through direct trade between individual groups, or through trips to Lake Superior to exploit the surface deposits located there. Copper artifacts similar to those documented on Allumette Island in the Ottawa River have been discovered in Wisconsin, Michigan, New York State and Manitoba (Kennedy 1970). This commodity, as well as other tradable goods, was presumably transported by canoes and other vessels along the navigable waterways including the Ottawa and St. Lawrence Rivers.

The earliest evidence of human burials within eastern Ontario are interpreted to date to the Archaic Period (Pilon and Young 2009). Excavations at Allumette and Morrison Islands have found burial sites containing the remains of dozens of individuals within deposits that appear to have been used continuously for millennia (Kennedy 1966). The inclusion of grave offerings such as natural copper pieces in burials found at the site of Coteau-du-Lac provides evidence for Archaic Period ritual practice (Pilon and Young 2009). Other sites with Archaic Period components within the Ottawa Valley region have been noted on Aylmer Island, Chaudière Falls, Wilber Lake, Leamy Lake, the

Rideau Lakes (Watson 1982), Jessups Falls, and in Pendleton (Daechsel 1980). The Chesterville 2 site (BgFt-6) situated over 10 km east of the study area represents the only registered Archaic Period archaeological site in Winchester Township, and no known Archaic Period archaeological sites have been registered within Williamsburgh Township (MHSTCI 2021).

The Woodland Period (*ca.* 2,800 to 450 BP) is primarily distinguished from the Archaic Period by the introduction of ceramics (Wright 1972a). Early Woodland Period inhabitants continued to live as hunters, gatherers and fishers in much the same way as earlier populations had done. They also shared an elaborate burial ceremonialism influenced by the inclusion of exotic artifacts within grave deposits (Spence et al. 1990). No known archaeological sites specific to the Early Woodland Period have been registered within Winchester and Williamsburgh Townships.

By the Middle Woodland Period (2,400 to 1,150 BP) regional cultural expressions or traditions have been distinguished by archaeologists. These traditions have been identified based on patterns of ceramic decorations and use of lithic materials, and are the primary basis to differentiate the Middle Woodland Period from the Early Woodland Period. A greater number of known sites from this period have been investigated allowing archaeologists to develop a better picture of the seasonal round followed in order to exploit a variety of resources within a home territory. Through the late fall and winter, small groups would occupy an inland "family" hunting area. In the spring, these dispersed families would congregate at specific lakeshore sites to fish and hunt in the surrounding forest and socialize. This gathering would last through to the late summer when large quantities of food would be stored for the approaching winter.

Along the St. Lawrence River in the vicinity of the study area, occupation during the Middle Woodland Period was documented at the St. David's Cemetery site (BgFr-7), the Little Ault Park site (BgFr-4), the Snapper site (BgFq-6) and the Thistle site (BgFq-9), indicating the use of this waterway during the Middle Woodland Period.

The Ottawa River, located north of the study area, represents another major waterway utilized for transportation and subsistence strategies during the Middle Woodland Period. Middle Woodland Period sites have been identified at Marshall's and Sawdust Bays (Daechsel 1980; Daechsel 1981), Rockcliffe Park (Pilon 2008; Pilon and Boswell 2015), as well as at Leamy Lake (Laliberte 1995), along the Rideau River (Golder 2017; Patterson 2016) and within the City of Ottawa west of Bank Street (Golder 2014). Sawdust Bay 2 (BiGb-6), located approximately 750 m west of where the Mississippi River drains into the Ottawa River, represents a camp site radiocarbon dated to 1560 BP (± 290 BP) and interpreted to reflect the Point Peninsula Tradition. The corresponding artifact assemblage shows that subsistence was focused on hunting fauna living in the adjacent lakes and swamps. The Leamy Lake and Rockcliffe Park Sites, all located in the area around the mouth of the Gatineau River and the east shore of the Ottawa River, show evidence of seasonal warm weather settlement spanning a period from 4000 BP up to at least the Middle Woodland Period (Pilon and Boswell 2015). Along the South Nation River, one Middle Woodland Period site, Kittle Creek 1 (BgFt-3), has been registered west of Chesterville (MHSTCI 2021).

Another significant development during the Woodland Period was the introduction of agriculture and appearance of domesticated plants ca. 1,450 BP. Initially, only a minor addition to the diet, the cultivation of corn, beans, squash, sunflowers and tobacco gained economic importance during the Late Woodland Period (1,150 BP – 450 BP). Unlike in southern Ontario, where the shift in subsistence resulted in the development of semi-permanent and permanent villages, evidence suggests that much of eastern Ontario remained primarily occupied by mobile hunter-gatherers. In part, this was because the terrain was less than suitable for early agriculture. It was also a reflection of the increased pressure on hunting territories and conflict over trade routes at the end of the Woodland Period. The few village sites that have been documented in eastern Ontario are most commonly located near the St. Lawrence River, including the Beckstead Site (BfFt-1) (Pendergast 1984) which is located within the present study area.

Smaller Late Woodland Period (1,150 BP – 450 BP) sites have also been recorded throughout the general study area and Ottawa Valley. Two small Late Woodland sites were identified on a property near the Village of Cumberland (Ferris 2002). A significant Woodland Period occupation has also been identified at the Leamy Lake site and several burials dating to the Archaic Period have also been documented on the north side of the Ottawa River, just east of the Chaudière Falls. Many of these burials were observed during the mid-19th century, with upwards of twenty individuals documented along the northern shore of the Ottawa River between the Chaudière Falls and the Gatineau River. Many of these interments were associated with red ochre deposits, although there does not appear to be a consistent deposition positional pattern to those recorded (Pilon and Boswell 2015). Within Winchester and Williamsburgh Townships, Late Woodland sites include the Beckstead Site (BfFt-1) (Pendergast 1984), the Steward Site (BfFt-2) situated within the town of Morrisburg just west of the study area (Jamieson 1982), and the Chesterville 2 Site (BgFt-6) (MHSTCI 2021).

By the end of the Late Woodland Period, distinct regional populations occupied specific areas of Ontario separated by vast stretches of largely unoccupied land, including the Huron along the north shore of Lake Ontario, the Algonquins along the Ottawa River and the St. Lawrence Iroquois along the St. Lawrence River. Facing persistent hostilities with Iroquoian populations based in what is now New York State, the Huron moved from the north shore of Lake Ontario to the Lake Simcoe and Georgian Bay region and the St. Lawrence Iroquois relocated sometime in the late 16th century with refugees possibly dispersing among the Algonquin populations in the Ottawa Valley region (Pendergast 1999).

The Algonquins, who occupied the lands north of the Huron, had historical hunting territories in the Ottawa Valley that may have extended as far east as the St. Maurice River in Quebec. They also claimed the lowlands south of the St. Lawrence River after the disappearance of the St. Lawrence Iroquois in the late 16th century (Trigger and Day 1994). At the time of initial contact, the French documented several Algonquin groups residing in the vicinity of the general study area (Heidenreich and Wright 1987). These included the Kichesipirini of Morrison Island, the Matouweskarini along the Madawaska River to the west, the Onontchataronon in the Gananoque River basin to the southwest, and the Weskarini, the largest of the three, situated in the Petite Nation River basin to the northeast.

Though it is often difficult to link archaeological sites to specific historical Indigenous groups, the Highland Lake site (BiGh-1), located west of Ottawa, may be an Algonquin site associated with the Matouweskarini (von Gernet 1992). Ottawa Valley Algonquin sites typically consist of shallow deposits characteristic of seasonal occupation by small family groups within family or band territorial limits and are typically located on the headwaters of major tributaries (Pendergast 1999). Exceptions include a number of summer camps identified at Morrison Island and Leamy Lake where larger groups came together (Pilon and Boswell 2015).

The Algonquins' location along the same river networks used for transportation by early French traders positioned them to monopolize the early fur trade with the two communities becoming close allies following Champlain's expedition in 1603. Competition for furs increased existing tensions between the Algonquin communities and their neighbours including the Haudenosaunee Nations, such as the Mohawk, residing to the south in what is now Ontario and New York State. The 17th century saw a period of conflict known as the Beaver Wars between the Algonquin and the Haudenosaunee that resulted in the significant disruption of life. Mohawk raids against Algonquin villages in the Upper Ottawa and St. Lawrence Valleys resulted in the abandonment or destruction of many Algonquin settlements in these areas (Trigger and Day 1994). Some Algonquin's found refuge in French settlements such as Trois-Riviéres, Quebec City, Sillery, and Montreal while others may have retreated to interior locations along the Ottawa River's tributaries (Holmes 1993). At the end of the 17th century, the Haudenosaunee were driven out of much of southern Ontario by the Mississaugas though they continued to occupy parts of eastern Ontario on a seasonal basis.

The French brokered a peace treaty in 1701 at Montreal where the Algonquin, the French, and the Haudenosaunee agreed to peacefully share the lands around the Great Lakes (INAC 2011). In exchange for peace, the Algonquin gave the Haudenosaunee secure access to furs which the Haudenosaunee used to secure their alliance with the British. Between 1712-1716, Algonquins were noted as living along the Gatineau River with the Haudenosaunee occupation located south of the St. Lawrence River (Holmes 1993). By 1740, Algonquin communities were present in the vicinity of Trois-Rivières, Riviere Lievre and Mohawk community members were residing near Lake of Two Mountains (Holmes 1993).

Following the Seven Years' War during the mid-18th century, the defeat of the French, Algonquin, and their allies by the British and the Haudenosaunee resulted in the further loss of Algonquin hunting territories in southern Quebec and eastern Ontario as the British seized France's colonies. The extension of Quebec's boundaries in 1774 through the Quebec Act and the use of the Ottawa River as the boundary of Upper and Lower Canada following the 1791 Constitution Act separated the Algonquins between two government administrations (AOP n.d.).

Britain's colonial policy differed from the French in that the Crown was much more interested in securing land surrenders from the Indigenous populations for settlement by Europeans. The Royal Proclamation of 1763 issued by King George III enabled the Crown to monopolize the purchase of Indigenous lands west of Quebec. Although the proclamation recognized Indigenous rights to their land and hunting grounds, it also provided a way through which these rights could be taken away (Surtees 1994). Land cession agreements between Indigenous groups and the Crown increased following the War of 1812 as a new wave of settlers arrived in Upper Canada primarily from Britain. The Crown implemented annuity systems in the purchase of lands from Indigenous peoples where the interest payments of settlers on the land would cover the cost of the annuity rather than pay a one-time lump sum. By the 1850s, Indigenous groups had become cautious of these agreements and began to demand the retention of reserved land and preservation of hunting and fishing rights (Surtees 1994).

Between 1783 and 1784, Captain William Redford Crawford negotiated on behalf of the Crown with the Mississauga chiefs living in the Bay of Quinte region. In the so-called "Crawford Purchase," Crawford negotiated for the lands located east of the Bay of Quinte to the Trent River. This agreement was intended to provide land to the United Empire Loyalists and Indigenous allies following the American Revolution (Ontario 2020). The lands covered by the Crawford Purchase now includes the communities of Kingston and Brockville. The Crown again negotiated with the Mississauga of the Bay of Quinte and Kingston areas during the Rideau Purchase (1819/1822) which included a portion of Algonquin territory in the Ottawa Valley (Surtees 1994). The Algonquin and Nipissing, who were left out of the talks, protested the purchase, but were largely ignored (Holmes 1993).

The Indian Act of 1876 framed the relationship between the Canadian government and Canada's Indigenous peoples as a paternalistic one where the government served as their guardian until their cultures were able to integrate into Canadian society (INAC 2011). The Department of Indian Affairs was granted the authority to make policy decisions such as determine who was classified as Indigenous, manage their lands, resources and money, and promote "civilization". The consequence was the further erosion of Indigenous rights to autonomy and self-governance. The implementation of residential schools and adoption of Algonquin children by non-Indigenous families in the mid-20th century reflected further discrimination and the disregard of rights (AOP ND).

2.2 Post-Contact Regional History

Samuel de Champlain was the first European to document his explorations of the Ottawa Valley, initially in 1613 and again in 1615. He was preceded by two of his emissaries, Etienne Brule around 1610 and Nicholas de Vigneau in 1611. In the wake of Champlain's voyages, the St. Lawrence and Ottawa Rivers became principal routes for explorers, missionaries and fur traders travelling to the interior, and throughout the 17th and 18th centuries these waterways remained important links in the French fur trade.

Similar to other counties fronting the St. Lawrence River, substantial settlement in the United Counties of Stormont, Dundas and Glengarry began in the late 18th century with the arrival of United Empire Loyalists following the American Revolutionary War. The Surveyor General for Canada, Major Samuel Holland started to lay out the new lands in 1784. Initially, the new townships were simply assigned numbers due to the fast pace in which they were being surveyed (Leavitt 1879).

Following their arrival, the Loyalists drew their lots with each soldier receiving a grant of 100 acres fronting on the St. Lawrence and an additional 200 acres further inland within the same township. Officers were entitled to larger grants, based on their rank, with children of Loyalists also being granted free land. As a result, the entire riverfront within the newly surveyed Townships of Charlottenburgh, Cornwall, Osnabruck, Williamsburgh and Matilda (originally identified simply by numbers) were settled almost simultaneously (Lockwood 1996). Generally, Scots were placed in the eastern townships and the western townships were comprised mostly German immigrants.

Shortly after the distributions of property lots, the early settlers expressed desire for local governance. This area was considered part of the Montreal District until 1788 when Lord Dorchester announced the formation of new districts west of Montreal and the Counties of Stormont, Dundas and Glengarry became affiliated with the most eastern district of Lunenburg (Harkness 1946). By the end of the eighteenth century, all of the townships along the waterfront in the District of Lunenburg had been surveyed and partially settled. By 1826, the original districts had been broken up into to smaller districts, as settlement increased and the desire for further localized government grew. The United Counties became part of the Eastern District, and by the mid-1800s the districts were phased out as counties and townships took on more governing responsibilities.

During the War of 1812 with the neighbouring United States, many attempts were made to take Montreal. Just west of Montreal, the United Counties of Stormont, Dundas and Glengarry were not unaffected by this war. In November of 1813, the American military, led by General Wilkinson, arrived on Canadian soil between Prescott and Cornwall at Crysler's Farm near present-day Morrisburg. Even though the British were outnumbered in the battle they soundly defeated the American invaders, and the Canadian Parliament commemorated the battle with a plaque at Crysler's Farm in 1895 (Harkness 1946). The victory at the Battle of Crysler's Farm led to the American's abandoning their attempt to take Montreal (Bowering 1992).

The townships further from the St. Lawrence River were not settled nearly as quickly as those along the water. It wasn't until the 1880's, with the addition of several railways in the northern section of the county, that development in these areas began in earnest. Small centers such as Alexandria, Chesterville, and Avonmore grew considerably and new villages such as Maxville were established (Harkness 1946).

The St. Lawrence River had always been an important transportation route even prior to European settlement within the county, although there were several rapids between Cornwall and Prescott making navigation difficult. Several canals were constructed in an effort to improve navigation through the area, with the Cornwall Canal opening in 1842 and the Williamsburg Canals (Farran Point, Rapide Plat, Galop and Iroquois) completed in 1847. As early as 1895, a joint commission between the United States and Canada was initiated to discuss further developments to ensure the river could be utilized as a viable shipping route (Marin and Marin 1982).

Most citizens along the riverfront protested the flooding of their lands, while large companies lobbied for the construction of the St. Lawrence Seaway. Although the project was delayed due to two world wars and American inaction, in 1951 the *St. Lawrence Seaway Act* was approved in Canada and in 1954, the *American Seaway Act* was passed with approval granted for New York to join Ontario Hydro on the project (Marin and Marin 1982).

There were great expectations for the St. Lawrence Seaway as many believed it would bring significant economic growth to the United Counties of Stormont, Dundas and Glengarry. Ground was officially broken in August 1954 and the Seaway was officially opened five years later following construction of three large dams and several cofferdams. In the United Counties, Ontario Hydro bought 37,000 acres, with 6,500 people losing their homes and eight villages being affected including Iroquois, Aultsville, Farran's Point, Dickinson's Landing, Wales, Moilinette, Mille Roches, and Morrisburg. Railways and roads, including Highway 2, were moved while some structures were relocated, and two new towns (Ingleside and Long Sault) were created for the displaced people from the historic villages (Marin and Marin1982). Two cemeteries were raised, and 14 cemeteries originally positioned along the waterfront were amalgamated and moved to the St. Lawrence Valley Union Cemetery (Marin and Marin1982).

The creation of the St. Lawrence Seaway was considered by many to be the most significant engineering project of the decade in North America and possibly one of the most important in the world at the time (Marin and Marin 1982). Unfortunately, the Seaway did not bring the substantial economic growth to the area that was predicted, and the region's population has not drastically changed since the 1950's.

Upper Canada Village was created to showcase the history of the United Counties and more than half of the buildings showcased at the site originated from the United Counties (Marin and Marin 1982). Many parks and beaches were created along the river with signs and plaques commemorating historic sites and villages which had a positive effect on tourism in the area. In addition to these efforts to preserve the history of the United Counties, an archaeological investigation was carried out over three summers on Sheek Island to gather information and artifacts prior to the flooding of the area. An aboriginal settlement, including a burial site, was identified as being from the Point Peninsula Period (Marin and Marin 1982).

2.2.1 Winchester Township

The first European immigrants to Winchester Township settled along the Nation River in 1819 (Mika and Mika 1983). Many of the lots in the Township were awarded to the children of United Empire Loyalists, but most chose to sell their lands which were eventually settled by other immigrants. Early settlement and development were made difficult by the lack of roads. In the 1830s, the villages of Winchester and Chesterville developed following the construction of flour and sawmills (Mika and Mika 1983). The construction of the Canadian Pacific Railway Line in 1887 led to increased prosperity, particularly in Chesterville, which saw its population grow from around 500 in 1884 to over 750 in 1890 (Harkness 1946).

During the 20th century, agriculture maintained a significant role in the economic prosperity of the area. The establishment of Highway 31 in 1927 (Bevers ND) provided a convenient route to Ottawa and for many regional commuters. Highway 31 is no longer a provincial highway, as it was decommissioned in 1998. The road is still colloquially referred to as Highway 31 although its proper name is Stormont, Dundas and Glengarry County Road 31.

2.2.2 Williamsburgh Township

The former Williamsburgh Township was first settled in 1784 by United Empire Loyalists. It was formally organized in 1787 and named in honour of Prince William, Duke of Clarence and St. Andrews (future King William IV) (1765-1837), eldest son of King George III (1738-1820). The former Williamsburgh Township was laid out as a single front township with two 100 acre parcels per lot in each concession. Loyalists who settled in the former Williamsburgh Township were predominantly from the First Battalion of the King's Royal Regiment of New York. Lots with frontages along the St. Lawrence River were settled first and as the concessions and road networks developed, properties deeper in the former Williamsburg Township were settled.

Morrisburg, originally known as West Williamsburg, was named after the Honourable James Morris, Postmaster-General for Canada (1851–1853) (Scott 2010). During the War of 1812, the Battle of Crysler's Farm took place near Morrisburg. Eight thousand American troops were defeated by 1,200 Canadian militia, British regulars, and First Nations (Graves 1999). Most of the actual battle site was flooded during the construction of the St. Lawrence Seaway project.

The Township of South Dundas was created through the amalgamation of the former Township of Matilda and the former Township of Williamsburgh, and the villages of Iroquois and Morrisburg in 1998. The Township of South Dundas is a lower-tier municipality under the United Counties of Stormont, Dundas and Glengarry.

2.3 Study Area History

Historical plans, topographic maps, and aerial photographs provide evidence of the historical use of the study area. Plans of Winchester and Williamsburgh Townships dating to 1879 (Maps 3 and 4) show the study area largely follows the route of historical roads between Morrisburg and Winchester. The majority of properties along the corridor are already occupied by 1879 and several historical structures are shown within the vicinity of the study area, many of which are likely farmsteads. Lafleur Road does not appear to follow any 19th century roads.

Further development of Winchester and Williamsburgh Townships are shown in topographic maps from 1908 (Maps 5 and 6). Lafleur Road is visible east of the proposed well site.

Aerial photographs from 1954 (Map 7) show the well site was agricultural field until the later half of the 20th century. Much of the study area for the watermain corridor largely resembles present conditions.

3.0 ARCHAEOLOGICAL CONTEXT

3.1 Study Area Environment

The portion of the study area located north of the Town of Williamsburg is located within the Winchester Clay Plains physiographic region, a low-lying area within the South Nation River drainage basin. The original vegetation of the plains consisted primarily of red maple, elm, white and black ash which are all species characteristic of swamp-forest environments (Chapman and Putnam 1984). The original forests of the region were largely removed, and the swamps drained to convert the land to agriculture.

The portion of the study area located between Williamsburg and Morrisburg is located within the Glengarry Till Plains physiographic region. Area soils generally consist of hard clay silt that contains fine coarse sand, as well as gravel and boulders (glacial till) over limestone bedrock. This is typical of the Glengarry Till Plain (Chapman and Putnam 1984). The till contains a high proportion of limestone mixed with materials derived from the Precambrian rocks to the north and from the sandstone of the Nepean formation at the base of Rigaud Mountain in Quebec (Chapman and Putnam 1984). The wave actions of the prehistoric Champlain Sea deposited numerous bars of sand and gravel throughout the area (Chapman and Putnam 1984). Although there are lots of stones in the soil, it is fairly good for agricultural production.

The surficial geology of the study area is shown on Map 8. The well site consists of coarse–textured glaciomarine deposits. This includes beach ridges. Much of the primary study area corridor consists of till and fine textured glaciomarine deposits, with the wetter portions of the study area containing organic deposits.

3.2 Previously Completed Archaeological Assessments

The MHSTCI's Archaeological Report Database was searched on October 28, 2021, for previous archaeological assessments completed within 50 m of the study area (Map 9 and see supplementary documentation). James Pendergast conducted two archaeological excavations at the Beckstead Site in 1962 and 1971. These excavations are described in detail in Section 3.3. Golder (2018) conducted a Stage 1 archaeological assessment for the Highway 31 underpass located north of Morrisburg. The portions of the study area that passes through the Highway 31 underpass study area were identified as disturbed and not recommended for further archaeological assessment. Stantec (P381-0017-2014) conducted a Stage 2 archaeological assessment for the TransCanada Pipeline Ltd. Energy East project that intersected County Road 31 north of the Highway 401 underpass.

Other archaeological assessments conducted within the vicinity of the study area have been limited. CARF (1997, 2000) conducted Stage 1 and 2 archaeological assessments for a new 7 km long sewage system running from an existing sewage lagoon located northeast of the Village of Winchester to the South Nation River. Stantec (2020) conducted a Stage 1 and 2 archaeological assessment for several access roads and temporary workspaces TransCanada Line 300 Girth Welds. Three locations within Stantec's study area were located approximately 1.8 km east of the present study area. Stantec conducted another Stage 1-2 Archaeological assessment for Line 300 on Part of Lot 28, Concession 6 of Williamsburgh Township (P362-0270-2019).

Near the southern end of the study area, a number of archaeological assessments have been conducted on the Steward Site, a Late Woodland Period fishing station (Wright 1972b; Jamieson 1982).

3.3 Known Archaeological Sites

The primary source of information regarding known archaeological sites in the MHSTCI archaeological sites database (ASDB). The database was consulted on September 22, 2021, with the assistance of Robert von Bitter MHSTCI archaeological data coordinator. A total of 44 archaeological sites were identified within 10 km of the study area. Only two registered archaeological sites are known to be present within 300 m of the study area (Table 1).

Table 1: Archaeological Sites Within 10 km of the Study Area

Borden Number	Site Name	Time Period	Affinity	Site Type	Current Development Review Status
Distance less than 300 m					
BfFt-1	Beckstead	Late Woodland	Aboriginal	Village	Further CHVI
BfFt-10		Pre-Contact	Aboriginal	Unknown	Further CHVI
Distance more than 300 m					
BfFt-2	Steward	Late Woodland	Aboriginal	Village	Further CHVI
BgFw-1	Burkill	Post-Contact	Euro-Canadian	Unknown	No Further CHVI
BgFw-2	Pierces Corners	Post-Contact	Euro-Canadian	Cemetery, church / chapel, school	Further CHVI
BgFv-9	S.S. 14 Mountain	Post-Contact	Not Listed	School	No Further CHVI
BgFv-8	Kemptville Creek Pathway Site	Post-Contact	Not Listed	Other Warehouse, Unknown, wharf	Further CHVI
BgFv-7	Patterson Farm Site	Post-Contact	Not Listed	Not Listed	Unknown
BgFv-6	Clarke Farm Site	Post-Contact	Not Listed	Not Listed	Unknown
BgFv-5	Buckles Site	Post-Contact	Euro-Canadian	Homestead	Unknown
BgFv-4	North Grenville Public Library	Post-Contact	Euro-Canadian	Residential, store	No Further CHVI
BgFv-3	Kars	Archaic, Early	Aboriginal	Beach, camp / campsite	No Further CHVI
BgFv-2	Salamander Ranch	Post-Contact	Euro-Canadian	Unknown	Unknown
BgFv-19		Not Listed	Not Listed	Not Listed	Unknown
BgFv-18		Not Listed	Not Listed	Not Listed	Unknown
BgFv-17	Fenton Brickyard	Post-Contact	Not Listed	Manufacturing	Further CHVI
BgFv-16	Kemptville Post Office	Post-Contact	Euro-Canadian	Post office	No Further CHVI
BgFv-15	Cassidy	Post-Contact	Not Listed	Farmstead, midden	No Further CHVI
BgFv-14	Sipes Cabin Site	Post-Contact	Euro-Canadian	Cabin	Further CHVI
BgFv-13	Rideau Lakes Lime Kiln	Other	OtherEuro-Canadian	Other Lime Kiln	No Further CHVI
BgFv-12	Caughey Shanty 2 Site	Post-Contact	Not Listed	Farmstead	Further CHVI
BgFv-11	Caughey Shanty 1 Site	Post-Contact	Not Listed	Homestead	No Further CHVI
BgFv-10	Allen Creek Site	Woodland, Middle	Not Listed	Scatter	No Further CHVI
BgFv-1	Lewis/Bennett	Post-Contact	Euro-Canadian	Homestead	Unknown
BgFt-9	Brennan Farm	Post-Contact	Not Listed	Farmstead, homestead	Further CHVI
BgFt-8	St. Pierre Quarry	Post-Contact	Euro-Canadian	Homestead	No Further CHVI

Borden Number	Site Name	Time Period	Affinity	Site Type	Current Development Review Status
BgFt-7	Droppo	Post-Contact, Pre-Contact	Aboriginal, Euro-Canadian	Not Listed	Unknown
BgFt-6	Chesterville 2	Archaic, Late, Woodland, Late	Aboriginal	Unknown	Unknown
BgFt-5	Forward 1	Not Listed	Not Listed	Not Listed	Unknown
BgFt-4	Chesterville 1	Not Listed	Not Listed	Not Listed	Unknown
BgFt-3	Kittle Creek 1	Woodland, Middle	Not Listed	Unknown	Unknown
BgFt-2	Shane	Post-Contact	Euro-Canadian	House	Unknown
BgFt-1	Winchester Springs Cemetary	Post-Contact	Euro-Canadian	Burial	Unknown
BgFs-3		Post-Contact	Not Listed	Scatter	Further CHVI
BgFr-8	Adams	Archaic, Middle	Aboriginal	Othercamp/campsite	Unknown
BgFr-7	St. David's Cemetery	Woodland, Late	Aboriginal, OtherSt.Lawrence	Othercamp/campsite	Unknown
BgFr-3	Osnabruck Meter Station Site	Post-Contact	Euro-Canadian	Homestead	Unknown
BgFr-12		Post-Contact	Not Listed	Homestead	Further CHVI
BgFr-11		Post-Contact	Not Listed	Homestead	Further CHVI
BgFr-10		Post-Contact	Not Listed	Farmstead, homestead	Further CHVI
BfFv-18		Other	OtherHistoric Euro Canadian	OtherHistoric Euro Canadian	No Further CHVI
BfFv-17		Post-Contact	Euro-Canadian	Homestead, midden	Further CHVI
BfFv-15	Straby	Post-Contact	Euro-Canadian	Homestead	Unknown
BfFv-12	Beach Road Site	Post-Contact	Euro-Canadian	Homestead	Unknown
BfFu-2	Wilson-Webster	Pre-Contact	Aboriginal	Findspot	Unknown
BfFr-2	Santa Cruz	Woodland, Late	Aboriginal, OtherSt.Lawrence	Othercamp/campsite	Unknown
BfFr-1	Henry	Woodland, Late	Aboriginal, OtherSt.Lawrence	Unknown	Unknown

The Beckstead Site (BfFt-1) represents a Late Woodland Period village site located south of Williamsburg along Highway 31. The earliest known description of the site comes from 1861 (Croil 1861) and describes the site as consisting of an earthen enclosure measuring approximately 18 inches high and covering an area of approximately 3 to 4 acres. Ploughing within the earthen enclosure during the early 19th century unearthed at least six human skulls, sherds of pottery, and dried maize.

Over the next century, the site was subject to erosion and looting resulting in the site location no longer being recognizable from the surface. It was not until 1962 when the first systematic archaeological excavations took place under the direction of James Pendergast who had taken an interest in the site. The 1962 excavation resulted in the identification of three midden areas. Pendergast (1984) undertook a second larger excavation in

1977 with the support of National Museum of Man, the Archaeological Survey of Canada, and members of the Ontario Archaeological Society to mitigate a 145 m long and 4.5 m wide portion of the site located along the east side of Highway 31 that was to be impacted by the widening of the highway. The 1977 excavations identified the remains of four long houses, eighteen burials, and several additional disarticulated remains belonging to 5 adults whose remains Pendergast suggested may represent ceremonially cannibalized prisoners of war. The presence of steatite beads, one marine shell bead, and a European blue glass trade bead indicated the inhabitants of the village participated in the trade of long distance goods, possibly being transported along the St. Lawrence River. The earthen embarkment suggests the village was likely protected by a defensive feature, such as a palisade.

Pendergast (1984) interpreted the Beckstead Site as an inland farming village inhabited by the St. Lawrence Iroquois. As his excavations uncovered relatively limited quantities of artifacts and an absence of large ash deposits, Pendergast (1984) suggests that the Beckstead Site may have been occupied for a short period of time or, alternatively, occupied by a small population. As the excavation was limited to the area to be disturbed by the widening of Highway 31, Pendergast did not excavate any of the long houses in their entirety. Using the locations of the earthen enclosure walls, he estimated the size of the site as approximately 3 acres (see supplementary documentation). Based on his estimates, the village is interpreted to extend west of Highway 31 and east of the extent of his excavations during the 1970s.

BfFt-10 represents an Indigenous archaeological site located in an agricultural field to the east of County Road 31 and within 300 m of the study area. Limited information on BfFt-10 is available from the ASDB and the site report is presently awaiting review, and was not available on Past Portal for the current Stage 1 assessment report. Based on the information provided to the MHSTCI, the site has been deemed to have further CHVI and recommended for a Stage 3 site-specific assessment.

The Steward Site (BfFt-2), a Late Woodland Period fishing station consisting of two houses, one of which contained burials of two fetuses and an infant, and a stratified midden is located within the Town of Morrisburg near the shore of the St. Lawrence River (Jamieson 1982). The Steward Site is located approximately 1 km west from the southern end of the study area.

3.4 Assessing Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present within a specific study area. In accordance with the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* the following are features or characteristics that indicate archaeological potential:

- Previously identified archaeological sites;
- Water sources:
  - Primary water sources (lakes, rivers, streams, creeks);
  - Secondary water sources (intermittent streams and creeks; springs; marshes; swamps);
  - Features indicating past water sources (e.g. glacial lake shorelines indicated by the presence of raised gravel, sand, or beach ridges; relic river or stream channels indicated by clear dip or swale in the topography; shorelines of drained lakes or marshes; and cobble beaches);
  - Accessible or inaccessible shoreline (e.g., high bluffs, swamps or marsh fields by the edge of a lake; sandbars stretching into marsh);
- Elevated topography (eskers, drumlins, large knolls, plateaux);

- Pockets of well drained sandy soil, especially near areas of heavy soil or rocky ground; Distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases (there may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings);
- Resource areas including:
  - Food or medicinal plants;
  - Scarce raw minerals (e.g. quartz, copper, ochre or outcrops of chert);
  - Early Euro-Canadian industry (fur trade, mining, logging);
- Areas of Euro-Canadian settlement; and,
- Early historical transportation routes.

In recommending a Stage 2 property survey based on determining archaeological potential for a study area, the MHSTCI stipulates the following:

- No areas within 300 m of a previously identified archaeological site; water sources; areas of early Euro-Canadian Settlement; or locations identified through local knowledge or informants can be recommended for exemption from further assessment;
- No areas within 100 m of early transportation routes can be recommended for exemption from further assessment; and,
- No areas within the property containing an elevated topography; pockets of well-drained sandy soil; distinctive land formations; or resource areas can be recommended for exemption from further assessment.

3.5 Features Indicating Archaeological Potential has been Removed

Archaeological potential can be determined not to be present when the area has been subject to extensive and deep land alterations that severely damaged the integrity to known or potential archaeological resources, including:

- Quarrying;
- Major landscaping involving grading below topsoil;
- Building footprints; and,
- Sewage and infrastructure development.

The placement of fill material over a known or potential archaeological site is not considered to be a land disturbance activity and does not negate the potential for archaeological resources unless there are known extensive and deep land alteration activities within the immediate location.

3.6 Potential for Archaeological Resources

Portions of the study area are considered to retain archaeological potential for historical Euro-Canadian resources due to the proximity to several areas of early Euro-Canadian settlement including the Towns of Morrisburg, Williamsburg, Winchester, and Winchester Springs as well as many historical farmsteads depicted on the 1879 plans (Map 3 and 4). County Road 31 follows the route of historical roads within Winchester and Williamsburg Townships. As per Standard 1d of Section 1.4.1 of the MHSTCI's *Standards and Guidelines for Consultant Archaeologists*, all areas within 100 m of early historical transportation routes have archaeological potential.

The potential to recover evidence of significant Indigenous occupation within the study area has also been identified within 300 m of any historical water sources including the South Nation River. Additionally, the study area is located within 300 m of two registered Indigenous archaeological sites including a Woodland Period Village. The proposed well site is located along an esker and has archaeological potential in any areas where previous land disturbance activities did not extend below the natural subsoil.

An overview of the archaeological potential within the study area is provided on Map 10.

4.0 SITE INSPECTION

A visual inspection of the study area was conducted by Randy Hahn, PhD (P1107) of Golder on October 22, 2021, under PIF P1077-0066-2021. The weather was mostly cloudy with a high of 9 degrees Celsius. At no time were the weather or lighting conditions detrimental to the assessment of archaeological potential.

The proposed well site located along Lafleur Road is the site of a former sand pit and as such, much of the area has been disturbed down through subsoil resulting in no archaeological potential. The area has been subject to excavation to remove topsoil and thus lays lower than the surrounding topography (Image 1, p. 27). Evidence of extensive land disturbance in this location is visible on Map 2A and much of the boundary of the sand pit consists of exposed soils providing evidence of the former extraction activities (Images 2 and 3, pp. 27-28). The southern end of the proposed well location contains a water filled pit (visible on Map 2A) demonstrating that the area was excavated below the water table (Image 4, p. 28). A small strip of land between the sand pit and Lafleur Road does not appear to have been previously disturbed (Image 5, p. 29) and may retain archaeological potential.

The watermain corridor begins at the water tower located within the Town of Winchester (Map 2B) (Image 6, p. 29). The water tower is accessible by a gravel road at the corner of Centre and North Streets. Beyond the gravel road, not much of this portion of the corridor shows visible disturbance although there are likely buried utilities associated with the watermain.

Much of the portion of the study area passing through Winchester has been developed. The right-of-ways of Centre Street, Main Street, and St. Lawrence Street are almost entirely paved or ditched indicating low potential for archaeological resources (Images 7 to 12, pp. 30-32). Where the study area follows Falcone Lane before heading south to County Road 31, the study area passes through areas that appear relatively undisturbed and may retain archaeological potential.

The remaining portion of the study area follows County Road 31 down to Morrisburg. Much of the right-of-ways south to the South Nation River show some evidence of ditching though not to the extent to fully remove the archaeological potential (Image 13, p. 33). County Road 31 passes over the South Nation River in the vicinity of Cass Bridge (Map 2J). The bridge has been raised above the surrounding landscape creating slopes on either side (Images 14 and 15, pp. 33-34).

Ground disturbance along the right-of-way of Stormont, Dundas and Glengarry Road 31 between the South Nation River and Winchester Springs varies with some areas containing deep drainage ditches (Image 16, p. 34) while others appearing to be relatively undisturbed. Within Winchester Springs, the right-of-ways are almost entirely paved (Image 17, p. 35).

Disturbance due to the creation of drainage ditches is common between Winchester Springs and Williamsburg (Images 18 to 24, pp. 35-38). Where the right-of-way have not been impacted by ditching, the road typically has been artificially raised above the surrounding topography to facilitate drainage. Portions of the right-of-way located next to the artificially raised road may retain archaeological potential.

Within Williamsburg, the right-of-ways generally consist of sidewalk (Image 25, p. 39). A cemetery is located immediately to the west of the study area on the northern end of the town (Image 26, p. 39). The portion of County Road 31 located north of Tollgate Road appears to be artificially raised above the adjacent fields (Image 27, p.40). As there is no evidence the fill for the road came from the adjacent properties, these areas may still retain archaeological potential. The east side of the road is level with the surrounding landscape (Image 28, p. 40).

Between Williamsburg and Morrisburg, some portions of the right-of-way are significantly ditched (Image 29, p. 41) while others appear to remain relatively undisturbed (Image 30, p. 41). The landscape around the on-ramp for Highway 401 and Village Road has been significantly altered to create overpasses over the highway and a rail line (Images 31 to 33, pp. 42-43).

Within Morrisburg, the right-of-way is generally partially ditched (Image 34, p. 43). Just north of Hill Trailer Park Road, the study area travels west to the area of the Morrsiburg water tower. Although the western end of the study area is located in an area that appears to have been recently disturbed by construction (Image 35, p. 44), much of this segment appears relatively undisturbed though there may be underground utilities associated with existing water infrastructure (Image 36, p. 44).

5.0 ANALYSIS AND CONCLUSIONS

While portions of the study area have been impacted by roads, the creation of drainage ditches, and development of the Towns of Winchester, Winchester Springs, Morrisburg, and Williamsburg, portions of the study area appear to consist of relatively intact natural soils that retain the potential for archaeological resources. The Beckstead Site, representing a Woodland Period Village, is also located within the study area and retained Cultural Heritage Value or Interest. As the site only underwent limited excavation/mitigation for the previous widening of Highway 31 in 1977, the exact boundaries associated with the Beckstead Site have not been confirmed and will require additional archaeological assessment to define the previous excavation limits and area that have not been subjected to archaeological assessments that meet the MHSTCI *Standards and Guidelines for Consultant Archaeologists* (2011). A map made during the previous excavation indicates County Road 31 passes through the middle of the village so there is a high probability for archaeological resources and human remains on both sides of the road (see supplementary documentation). Additionally, as County Road 31 was built over the site, intact archaeological resources likely remain under the road.

Village sites are uncommon in eastern Ontario and given the archaeological significance of the Beckstead Site as an example of a St. Lawrence Iroquois settlement, the potential to impact human remains, and its importance to local Indigenous communities, all efforts should be made to avoid impacting the site, including project reroute if possible. Local Indigenous communities should also be consulted prior to any decisions regarding potential impacts to the Beckstead Site or surrounding area so that they are provided with the opportunity to provide comments regarding the potential project impacts to the Indigenous site.

Mitigating the Beckstead Site will require significant archaeological excavation. As County Road 31 appears to have been built over the site, natural soil layers likely exist under the present roadway. Should ground disturbance occur in areas not previously mitigated through Pendergast's (1984) excavations, portions of the road and accompanying fill layers would need to be mechanically removed under the supervision of a licensed archaeologist so that the natural soil layers underneath could be assessed through hand excavation (e.g., shovel and trowel).

The site of the proposed well located west of Lafleur Road has been almost entirely disturbed by the pre-existing sand pit. As the surficial geology indicates the site is located along an esker, the potentially undisturbed soils located between Lafleur Road and the sand pit have potential for Indigenous archaeological resources and are recommended for Stage 2 test pit survey at 5 m intervals.

6.0 RECOMMENDATIONS

This Stage 1 archaeological assessment resulted in the following recommendations:

1) The Beckstead Site (BfFt-1) should be avoided and protected to prevent impact from potential landscape disturbances associated with the project. Should avoidance and protection not be possible, the Beckstead Site should be subject to Stage 3 site-specific assessment and Stage 4 mitigation of development impacts. The Stage 3 site specific assessment should involve the hand excavation of 1 m x 1 m test units at 5 m intervals in order to define the limits of the site and to develop an appropriate Stage 4 mitigation strategy. Based on the available information, intact portions of the Beckstead Site likely exist underneath County Road 31 and should any ground disturbance occur under the road in the vicinity of the site (See Maps SD1 and SD2 of the supplementary documentation), modern layers located above intact natural soils should be mechanically excavated under the supervision of a licensed archaeologist so that the intact natural soils can be subject to Stage 3 hand excavation prior to any development impacts.

2) Registered archaeological Site (BfFt-10) is considered to possess Cultural Heritage Value to Interest. Should any impacts occur within 70 m of the site, archaeological monitoring may be required.

3) Due to the presence of the Beckstead Site (BfFt-1) within the study area, a Woodland Period Indigenous village, and registered site BfFt-10, representing an Indigenous occupation location pre-dating European contact, local Indigenous communities should be engaged in the project and consulted prior to any decisions regarding impact to the site. The Beckstead Site is a significant archaeological site known to contain human burials and has high cultural value or interest.

4) Given the location of a historic cemetery adjacent to County Road 31, and that the exact boundaries of the potential burials are currently unconfirmed (i.e., the potential for unmarked burials), further Stage 3 investigation will be necessary to confirm whether the cemetery extends into the study area. This will entail the use of a smooth-bucket backhoe or Gradall to strip topsoil following the length of the cemetery limits, within a width of 10 m, along the boundary that falls within the cemetery limits. Once the subsoil is exposed, if it has been determined that no burial shafts fall within the limits of construction, the topsoil will be returned and all excavated areas filled in. Should burial deposits be encountered, the MHSTCI and the BAO must be contacted immediately.

5) Portions of the study area identified as having archaeological potential as shown on Map 10 should undergo Stage 2 test pit survey at 5 m intervals prior to any development impacts.

6) Portions of the study area identified as sloped, disturbed, or permanently wet have low or no archaeological potential and require no additional archaeological assessment.

7) Should the study area expand beyond the area shown on Map 10, additional archaeological assessment may be required.

7.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries, as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest , and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ontario Ministry of Consumer Services is also immediately notified.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.

8.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the archaeological profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

This report has been prepared for the specific site, design objective, developments and purpose described to Golder by the J.L. Richards & Associates Limited (the Client). The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges the electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client cannot rely upon the electronic media versions of Golder's report or other work products.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project.

Special risks occur whenever archaeological investigations are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain archaeological resources. The sampling strategies incorporated in this study comply with those identified in the Ministry of Heritage, Sport, Tourism and Culture Industries' *Standards and Guidelines for Consultant Archaeologists* (2011).

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10.0 IMAGES

Image 1: View northwest of the proposed well study area located west of Lafleur Road.

Image 2: View northwest showing the well study area has been excavated down into subsoil during its use as a sand pit.

Image 3: View east from within the proposed well study area showing the depth of the sand pit excavation. Lafleur Road is located along the high ground in the background.

Image 4: Flooded pit within the well study area showing excavation below the water table, view northeast.

Image 5: Undisturbed portion of the proposed well study area located between the sand pit and Lafleur Road, view northwest.

Image 6: Water tower located at the north end of the study area, view southwest.

Image 7: View northwest along Centre Street within Winchester. The right-of-way consists of sidewalk.

Image 8: View northeast along Winchester's Main Street showing disturbed right-of-way.

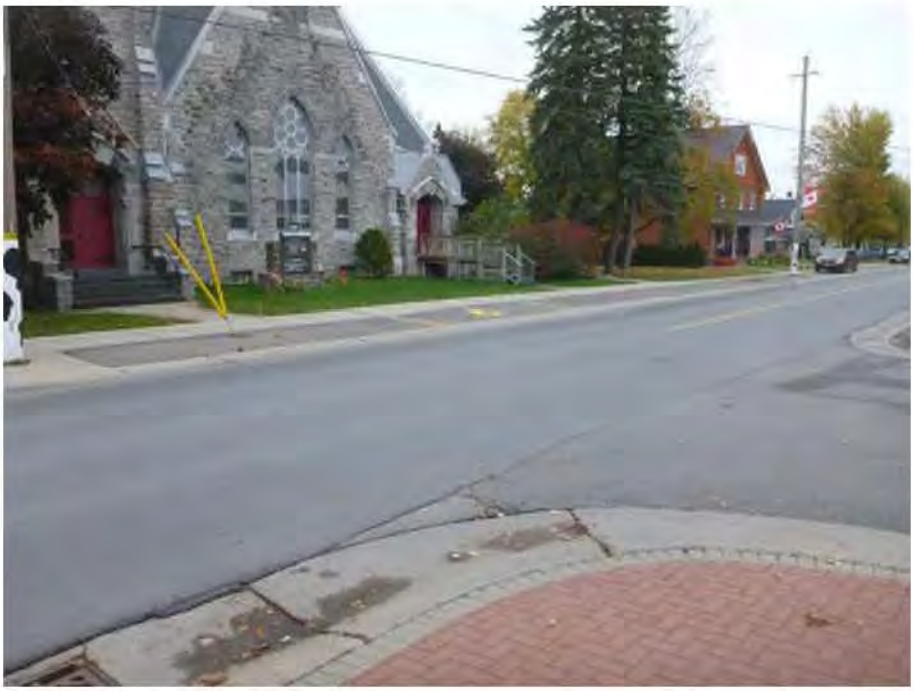


Image 9: View southeast of the intersection of St. Lawrence Street and Church Street.

Image 10: View southeast showing paved right-of-way of St. Lawrence Street within Winchester.

Image 11: View southeast showing ditched right-of-way along the east side of St. Lawrence Street within Winchester.

Image 12: Railway crossing within Winchester, view south.

Image 13: Ditched right-of-way of County Road 31, view northwest.

Image 14: Bridge over the South Nation River, view east. The banks of the river in the vicinity of the bridge are sloped.

Image 15: View southeast of the east side of Stormont, Dundas and Glengarry Road 31 in the vicinity of Cass Bridge showing the road has been built up above the surrounding landscape.

Image 16: Ditched right of way located north of Winchester Springs, view northeast.

Image 17: Right-of-way of County Road 31 through Winchester Springs, view southeast.

Image 18: Ditched right-of way, view northwest.

Image 19: Bridge over McMartin Drain, view northwest.

Image 20: View southeast along west side of County Road 31.

Image 21: Raised portion of County Road 31 with bridge over McMartin Drain, view southeast.

Image 22: Right-of-way of County Road 31, view southeast.

Image 23: Stretch of County Road 31 with relatively unmodified right-of-way, view southeast.

Image 24: View southeast of right-of-way at the intersection of County Road 31 and Forest Road.

Image 25: Present conditions of right-of-way through Williamsburg.

Image 26: Cemetery in Williamsburg located on the west side of County Road 31, view southwest.

Image 27: West side of County Road 31 located north of Tollgate Road showing road has been built up from the natural landscape, view northwest.

Image 28: View southeast along County Road 31.

Image 29: Drainage ditch located alongside County Road 31, view southeast.

Image 30: Relatively unmodified portion of the County Road 31 right-of-way located near the McHaffie Flea Market, view southeast.

Image 31: View southeast of the eastern side of the Highway 401 underpass.

Image 32: View southeast of the western side of the Highway 401 underpass.

Image 33: View northwest showing the east side of the rail line underpass located north of Morrisburg.

Image 34: View northwest of segment of County Road 31 that passes through Morrisburg, view northwest.

Image 35: Disturbed area located at the southern end of the watermain corridor, view west.

Image 36: View northeast of portion of study area located behind the Morrisburg Canadian Tire.

11.0 MAPS

LEGEND

STUDY AREA

0 2,000 4,000 8,000

1:200,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

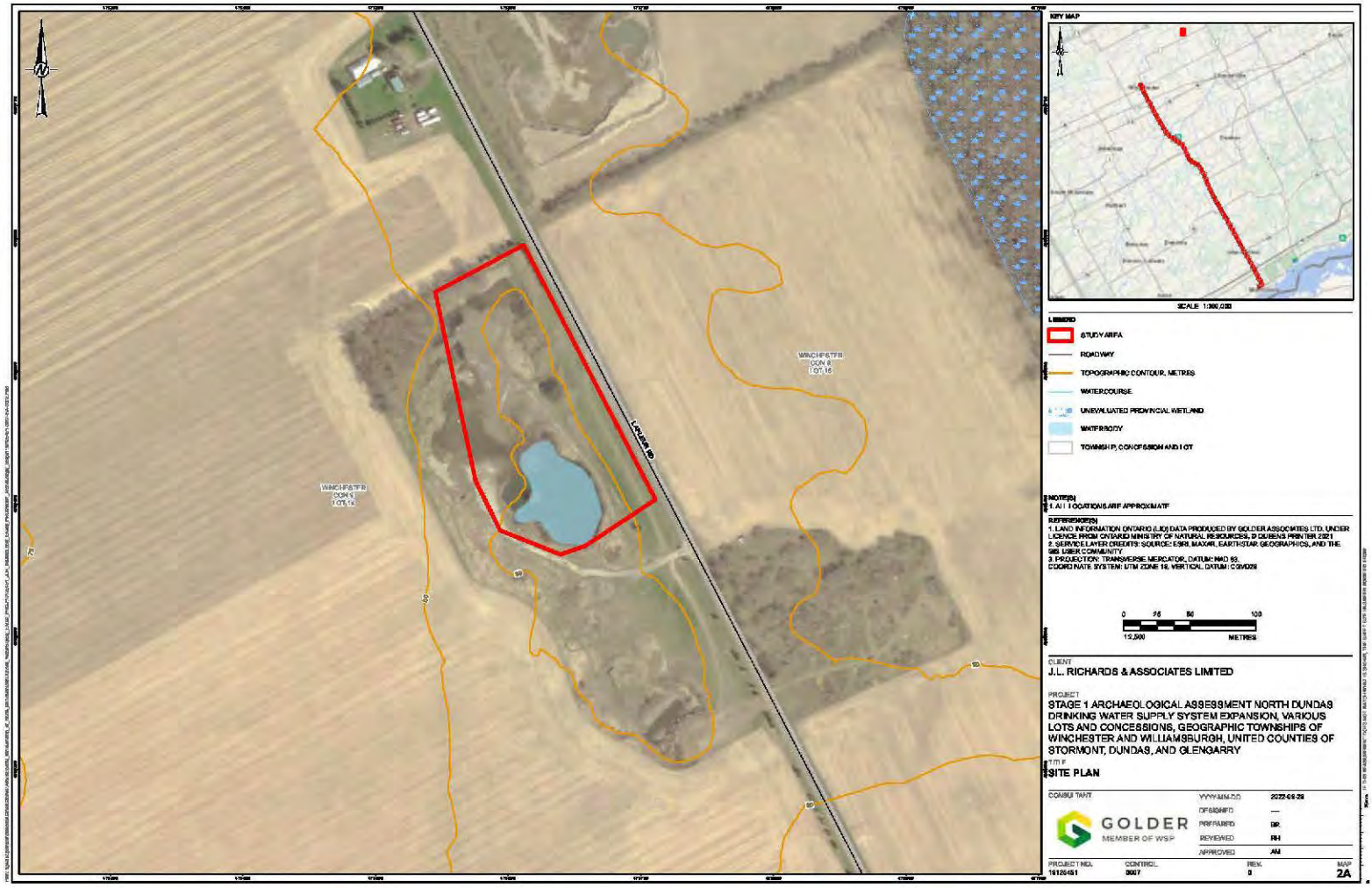
TITLE
KEY PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-28
DESIGNED	RH
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100

1:2,500 METRES

CLIENT

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PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2A

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	2B

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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REFERENCE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500 METRES

CLIENT
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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2C

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	---
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

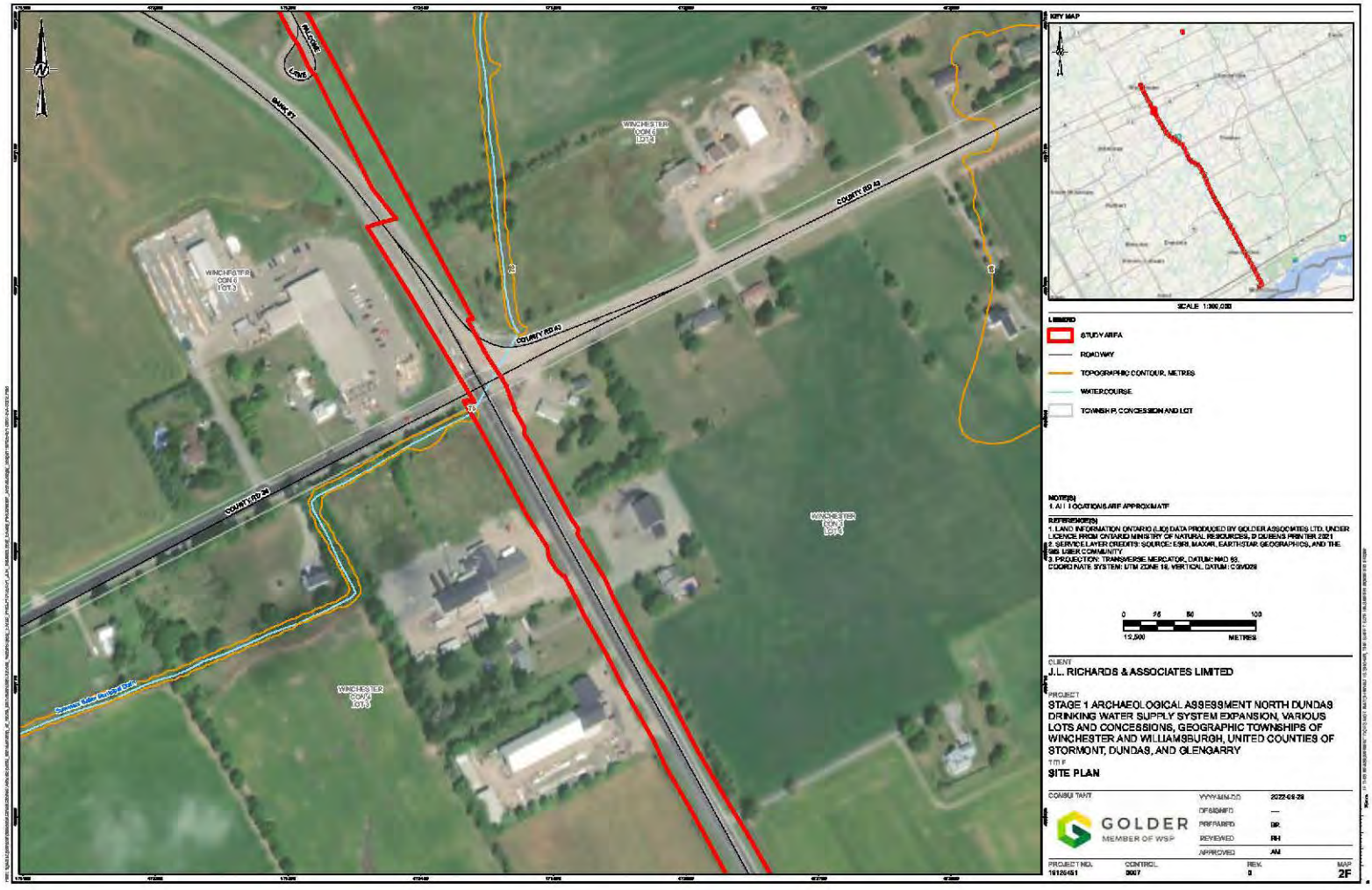
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2E


BANK ST
COUNTY RD 43
COUNTY RD 43
COUNTY RD 43
WINCHESTER CON 6 LOT 5
WINCHESTER CON 6 LOT 6
WINCHESTER CON 7 LOT 5
WINCHESTER CON 7 LOT 6
Dundas Water Supply DWS
KEY MAP
SCALE 1:350,000
LEGEND
STUDY AREA
ROADWAY
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
REFERENCE(S)
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0 75 50 100
1:2,500
METRES
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SITE PLAN
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 2F

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
1:2,500 METRES

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SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2G

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100

1:2,500 METRES

CLIENT

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TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2H

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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0 75 50 100
1:2,500
METRES

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CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	21

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100

1:2,500 METRES

CLIENT

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TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2J

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
1:2,500 METRES

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J.L. RICHARDS & ASSOCIATES LIMITED

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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2K

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2L

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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PREPARED	BR
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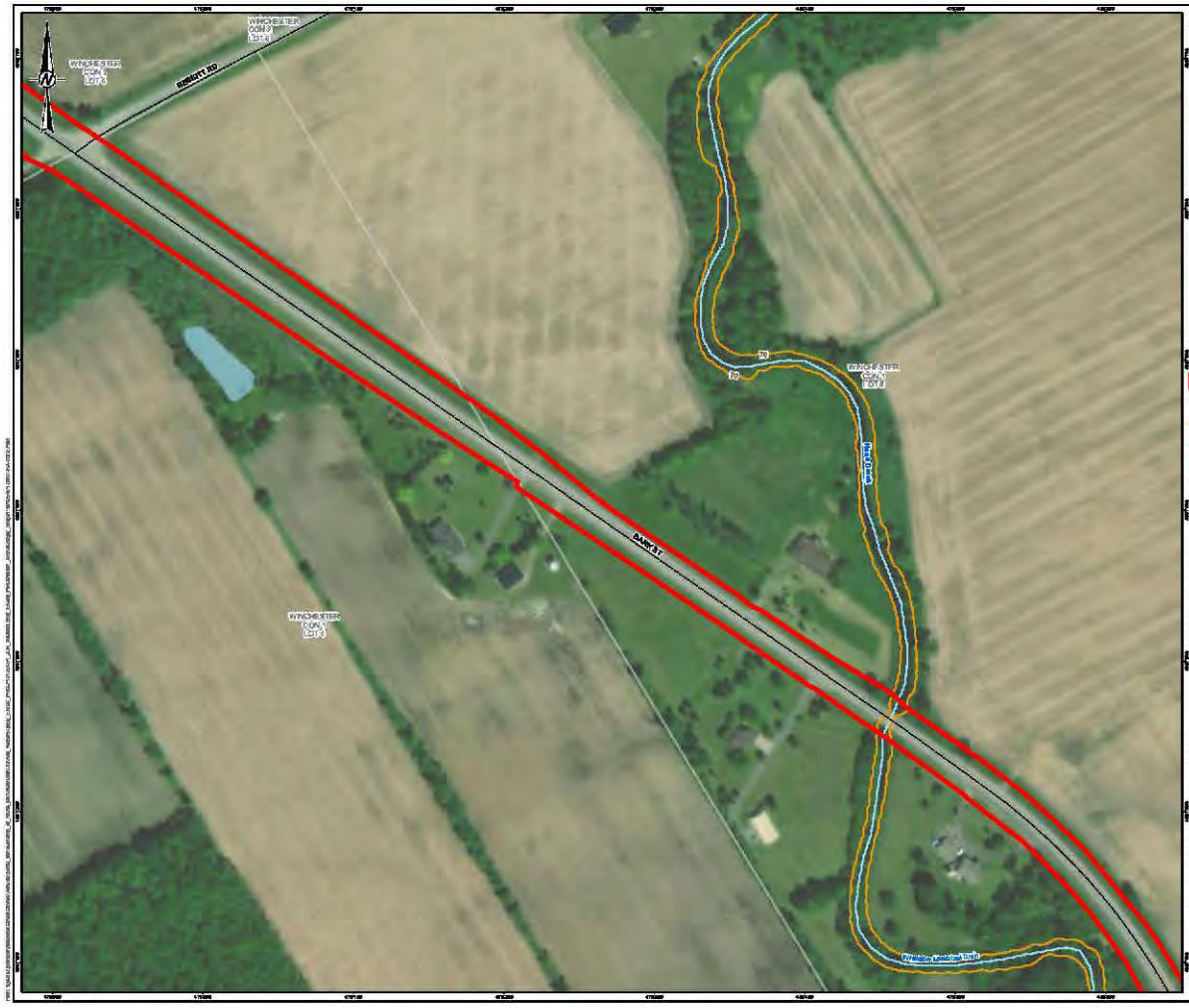
PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2M



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2N

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 75 50 100
1:2,500 METRES

CLIENT
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PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	20

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 75 50 100
1:2,500
METRES

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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2P

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100

1:2,500 METRES

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TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2Q

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	2R

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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PREPARED	SR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	25

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
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SCALE 1:350,000

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2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

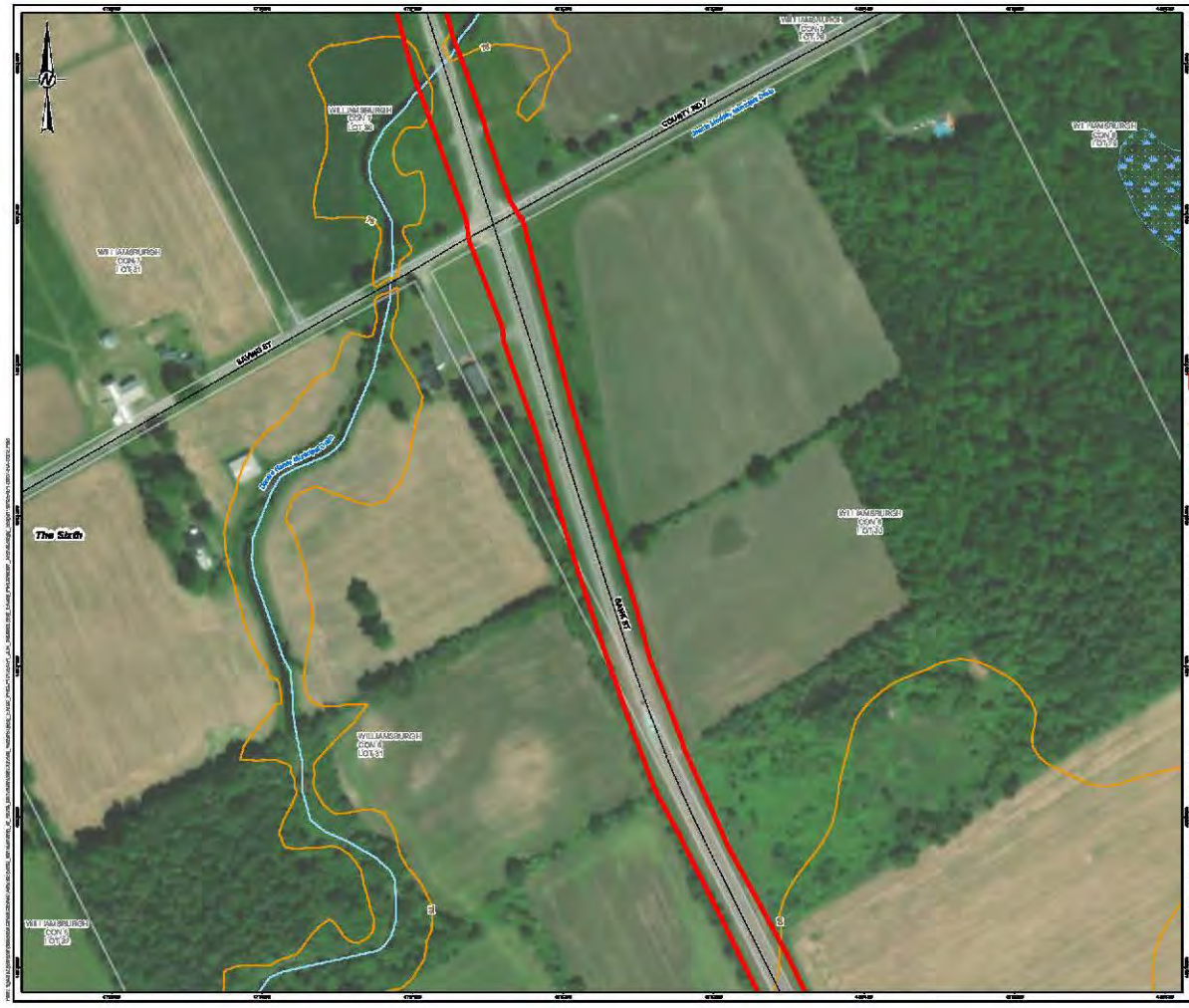
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2V



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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0 75 50 100

1:2,500 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

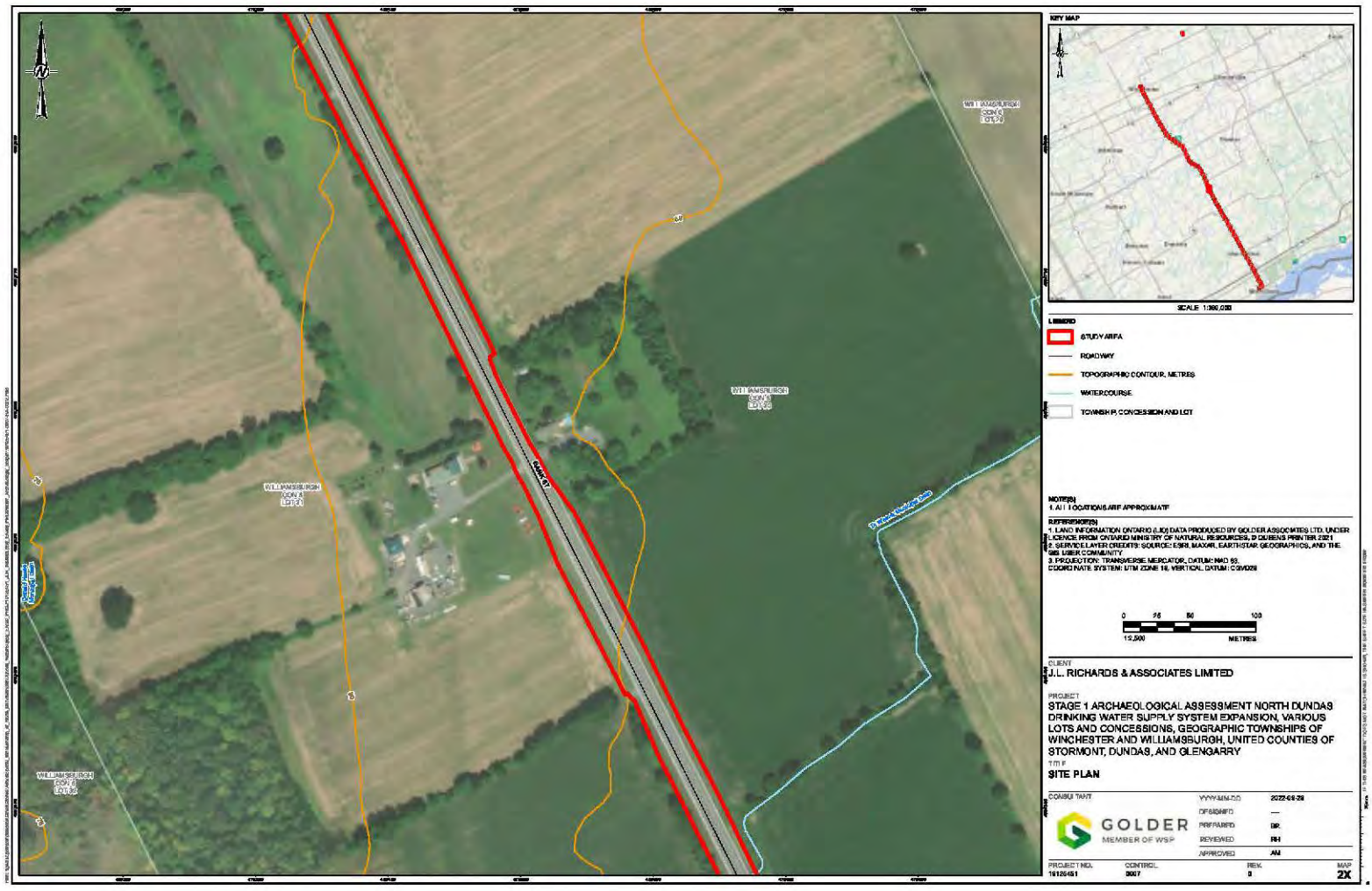
SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2W


KEY MAP
SCALE 1:350,000
LEGEND
STUDY AREA
ROADWAY
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28
0 75 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
SITE PLAN
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 2X

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

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0 75 50 100

1:2,500 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2Y

KEY MAP

SCALE 1:300,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPAVED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 75 50 100
1:2,500
METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	22

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2AA

KEY MAP

SCALE 1:300,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

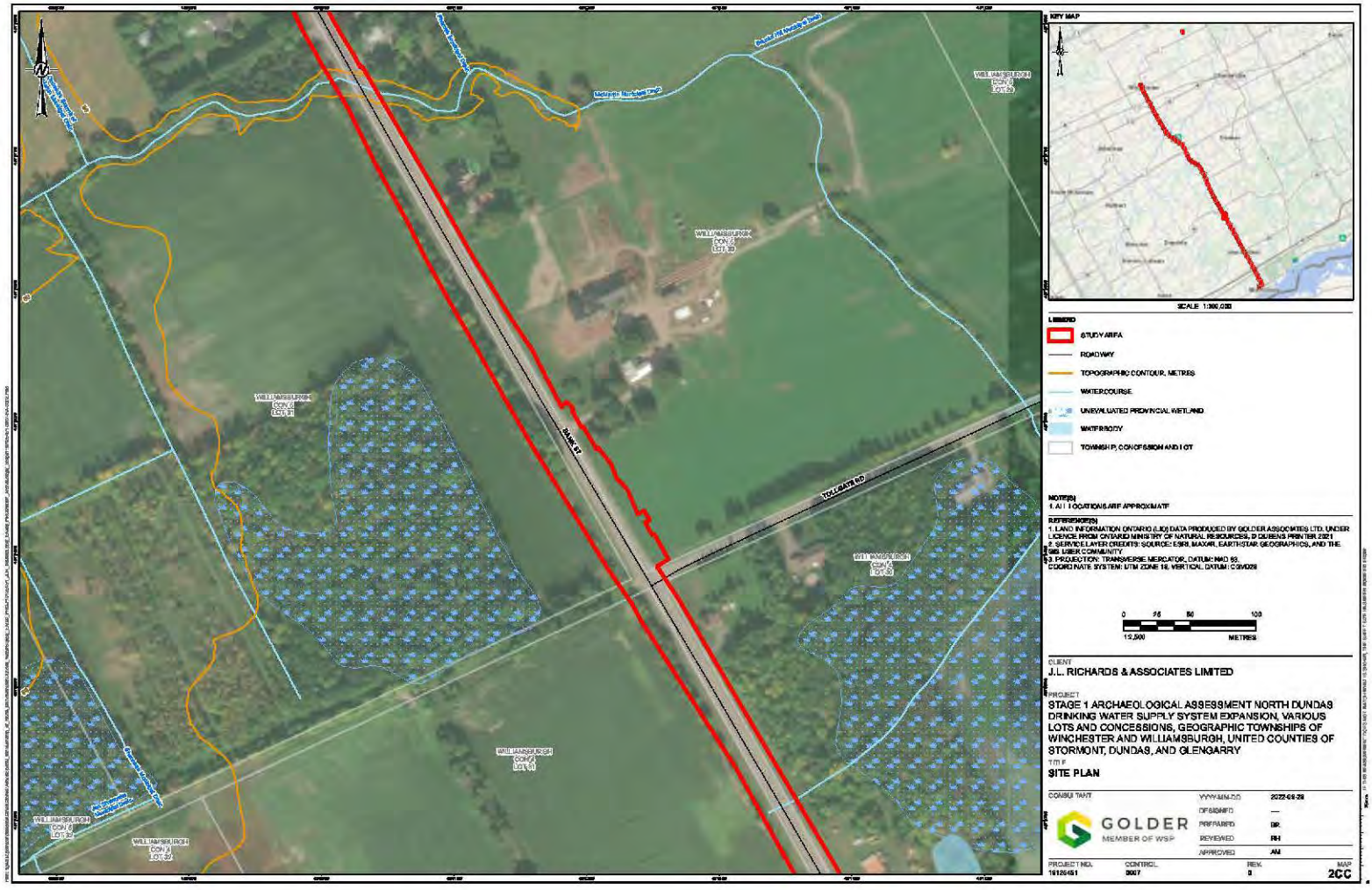
TITLE
SITE PLAN

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2BB


KEY MAP
SCALE 1:350,000
LEGEND
STUDY AREA
ROADWAY
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
UNEVALUATED PROVINCIAL WETLAND
WATERBODY
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
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0 75 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
SITE PLAN
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 2CC

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2DD

KEY MAP

SCALE 1:300,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100

1:2,500 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

SITE PLAN

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

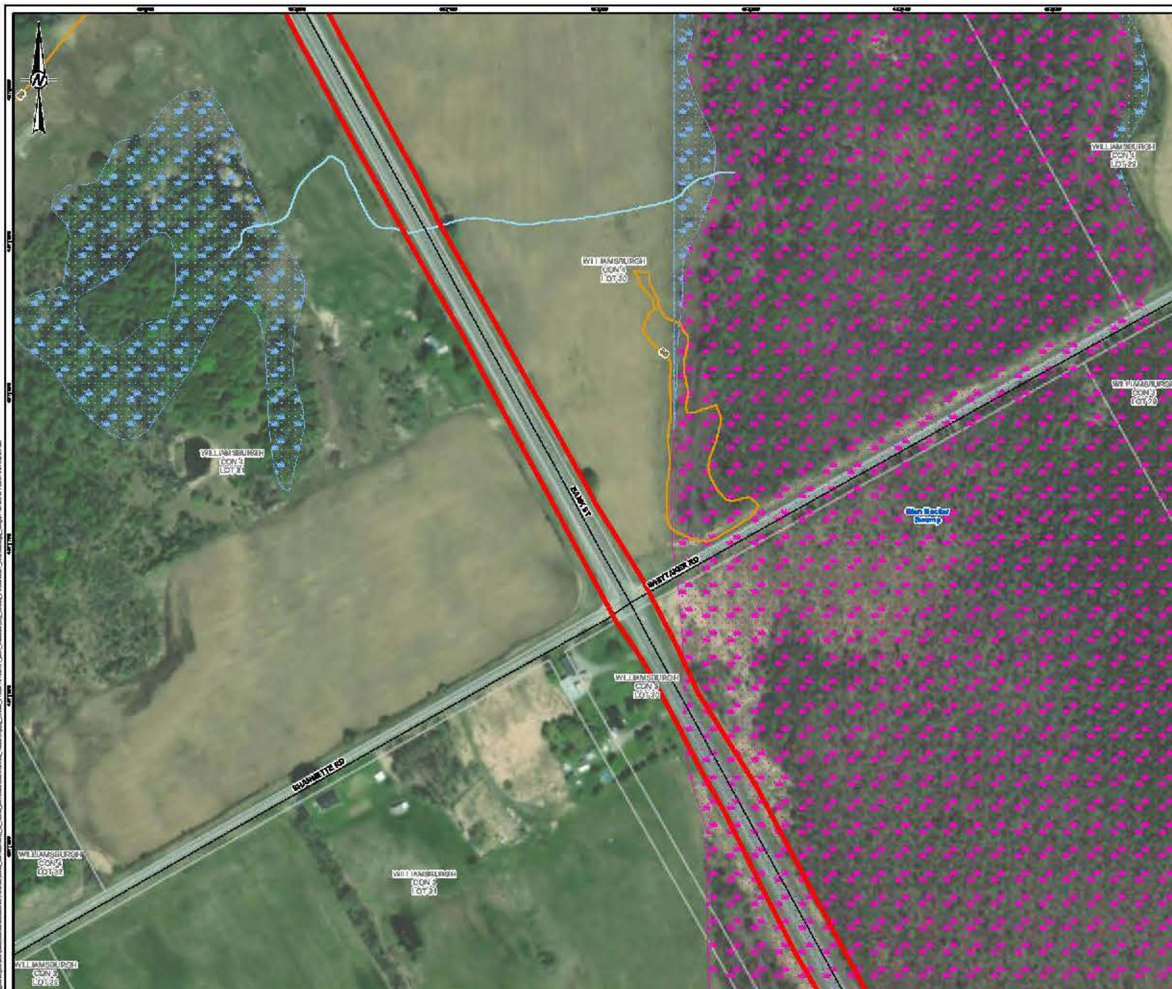
PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2EE

KEY MAP

SCALE 1:360,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED-PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT



NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	2FF

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
1:2,500 METRES

CLIENT
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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2GG

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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SITE PLAN

CONSULTANT
GOLDER
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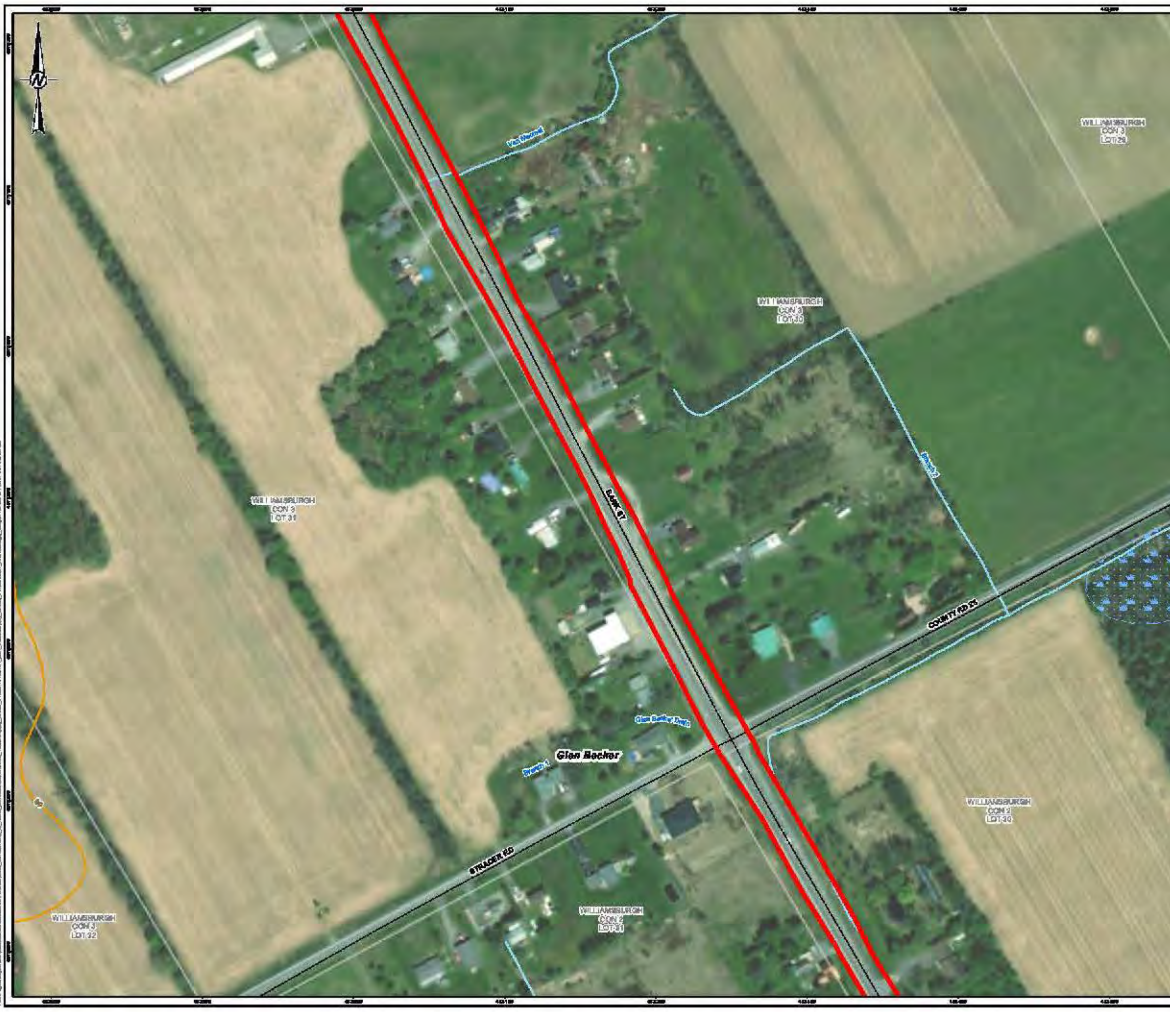
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	2HH



KEY MAP

SCALE 1:300,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
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0 25 50 100
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TITLE
SITE PLAN

CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-08-29
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2II

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPAVED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2JJ

KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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0 75 50 100
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J.L. RICHARDS & ASSOCIATES LIMITED

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SITE PLAN

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GOLDER
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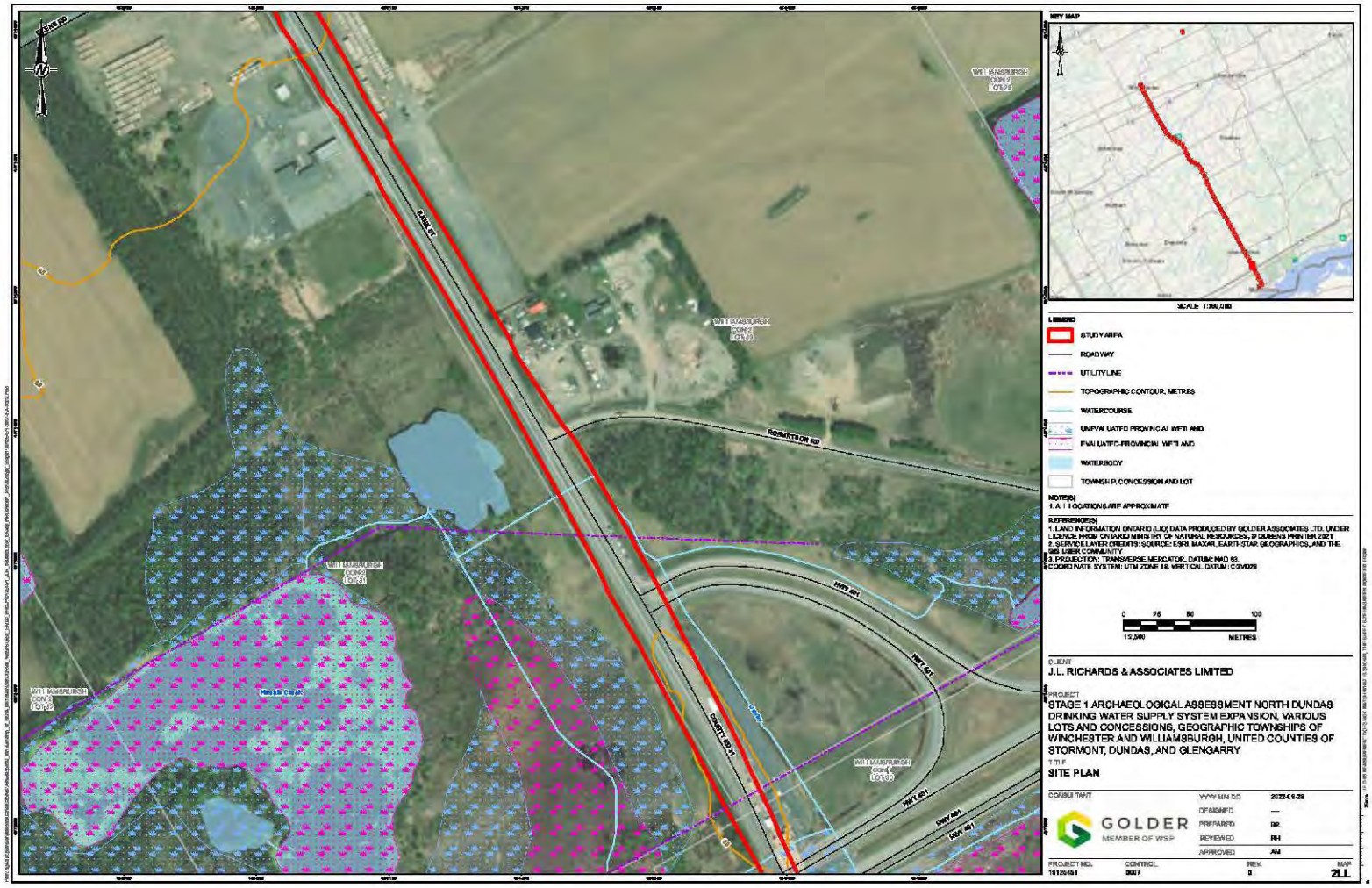
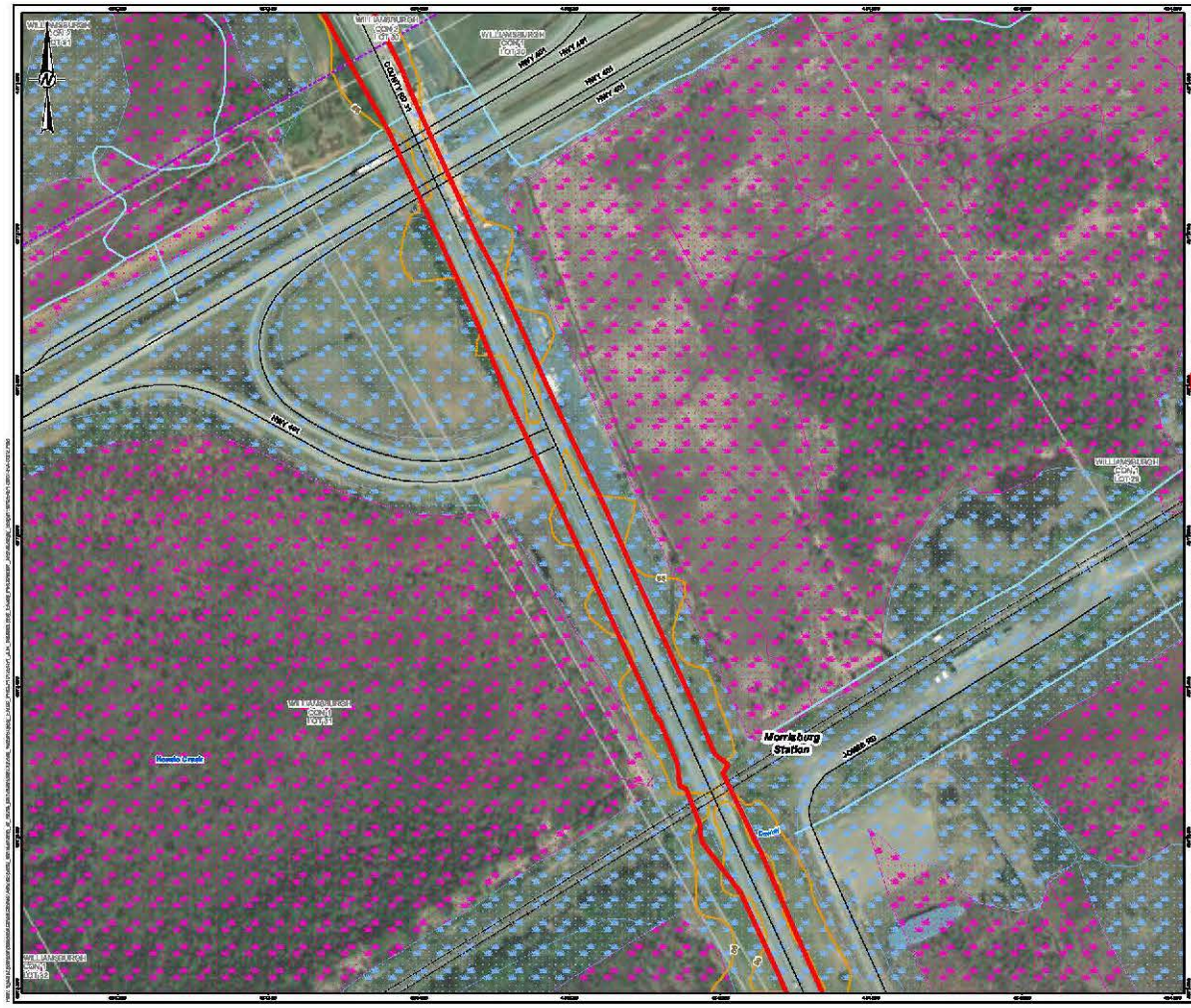
PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2KK


KEY MAP
SCALE 1:350,000
LEGEND
STUDY AREA
ROADWAY
UTILITY LINE
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
UNPVN DATED PROVINCIAL WETLAND
PNU DATED PROVINCIAL WETLAND
WATERBODY
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28
0 75 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
SITE PLAN
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 2LL



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPVNI DATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- WATERBODY

NOTES: TOWNSHIP, CONCESSION AND LOT
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

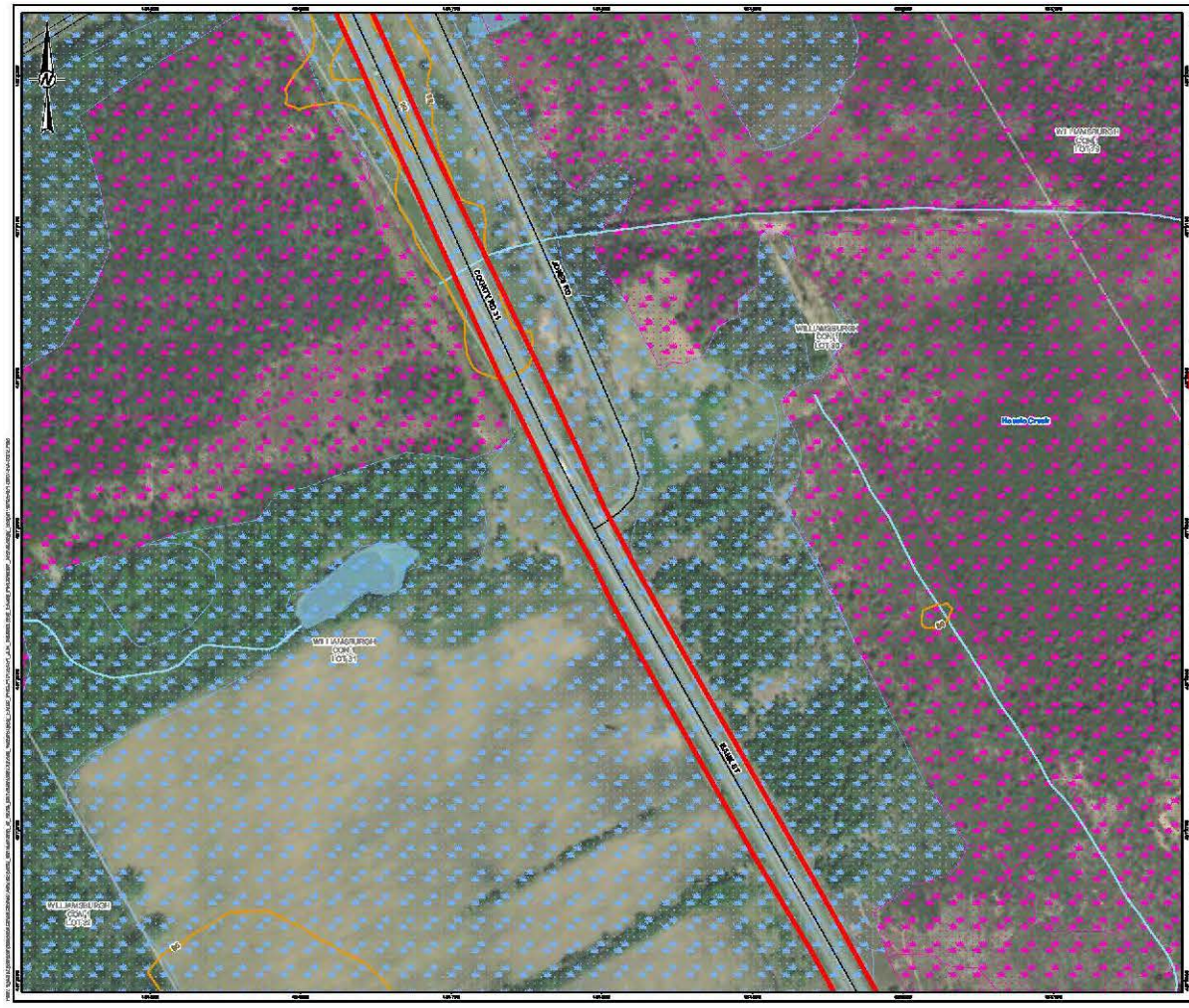
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2MM



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPAVED PROVINCIAL WETLAND
- PAVED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2021
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500
METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY/MM/DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2NN

KEY MAP

SCALE 1:300,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
4. COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

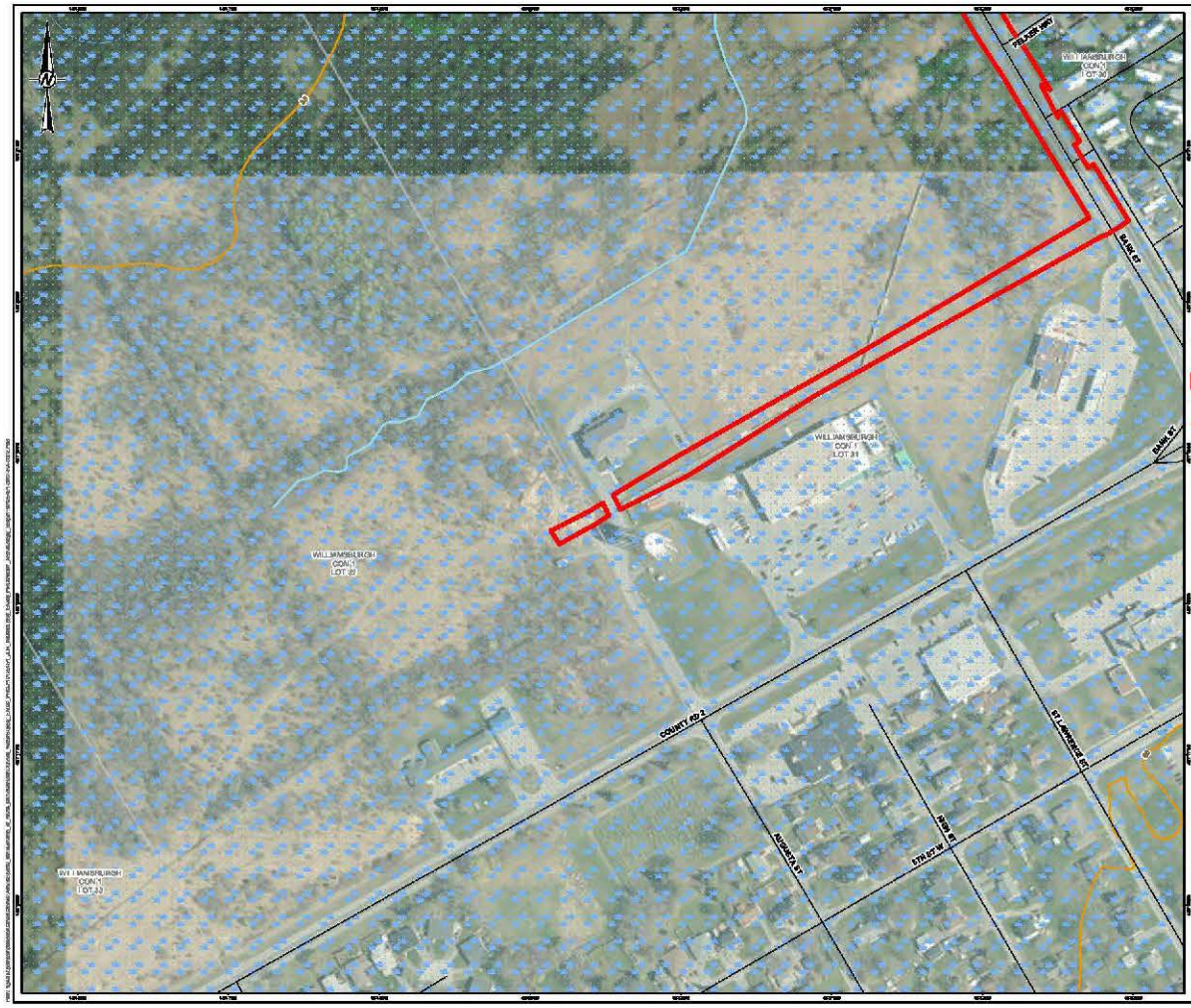
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	200



KEY MAP

SCALE 1:350,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 75 50 100
1:2,500
METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

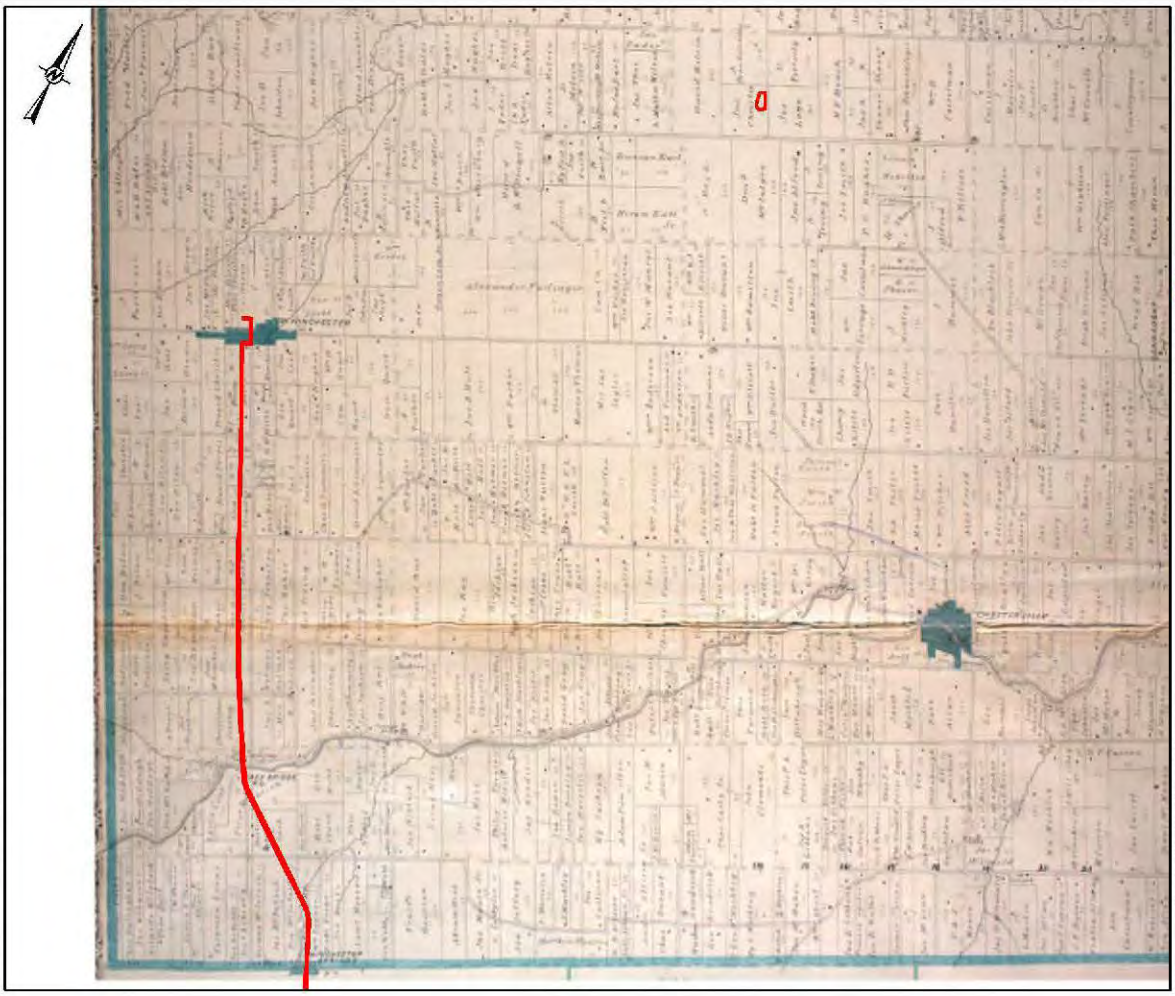
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	2PP



KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1879 TOWNSHIP OF WINCHESTER, BELDEN
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 400 800 1,600
1:50,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1879 PLAN OF WINCHESTER TOWNSHIP

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	3

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1878 TOWNSHIP OF WILLIAMSBURG, BELDEN
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 650 1,300 2,600

1:50,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

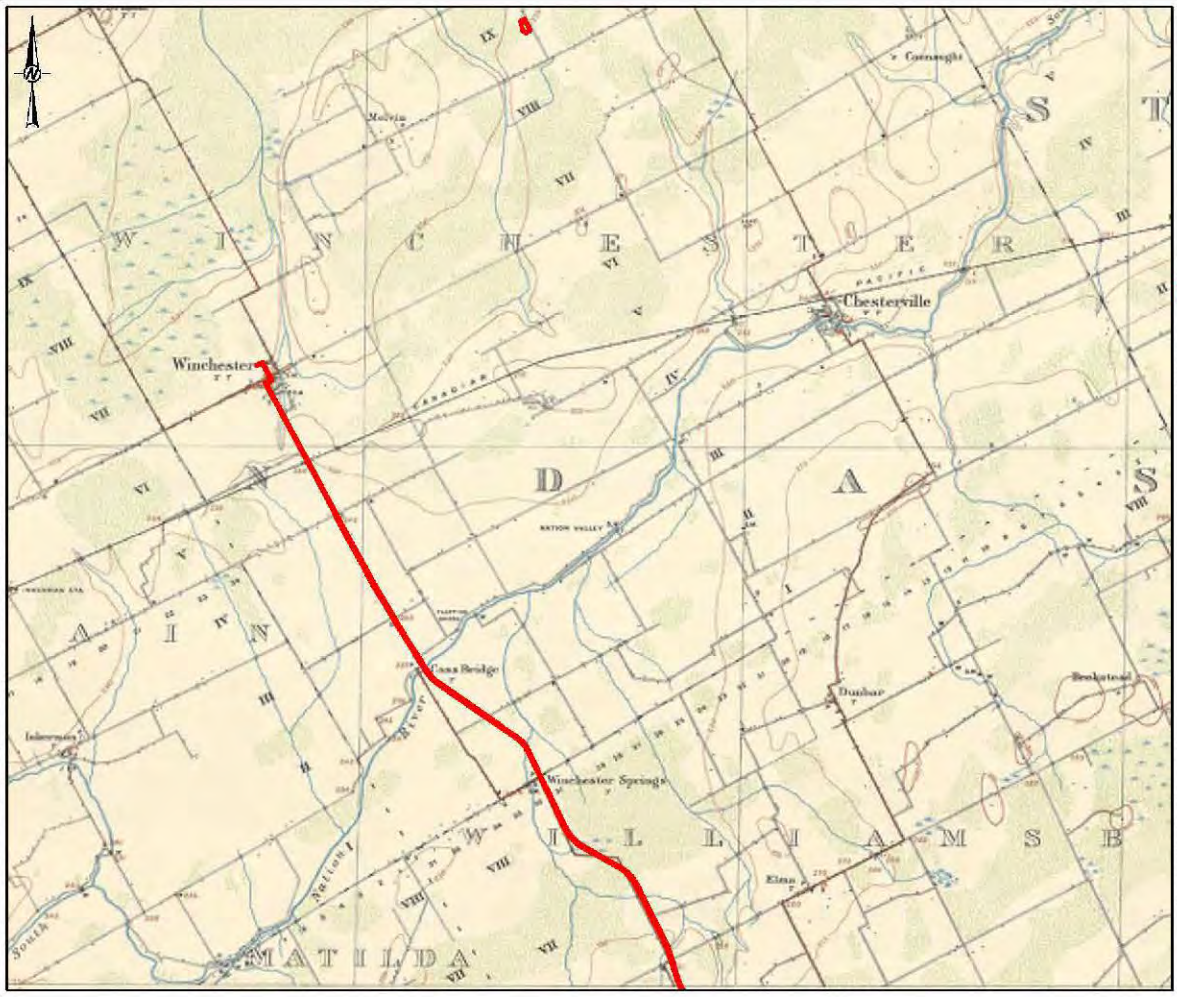
1879 PLAN OF WILLIAMSBURG TOWNSHIP

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	4



CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

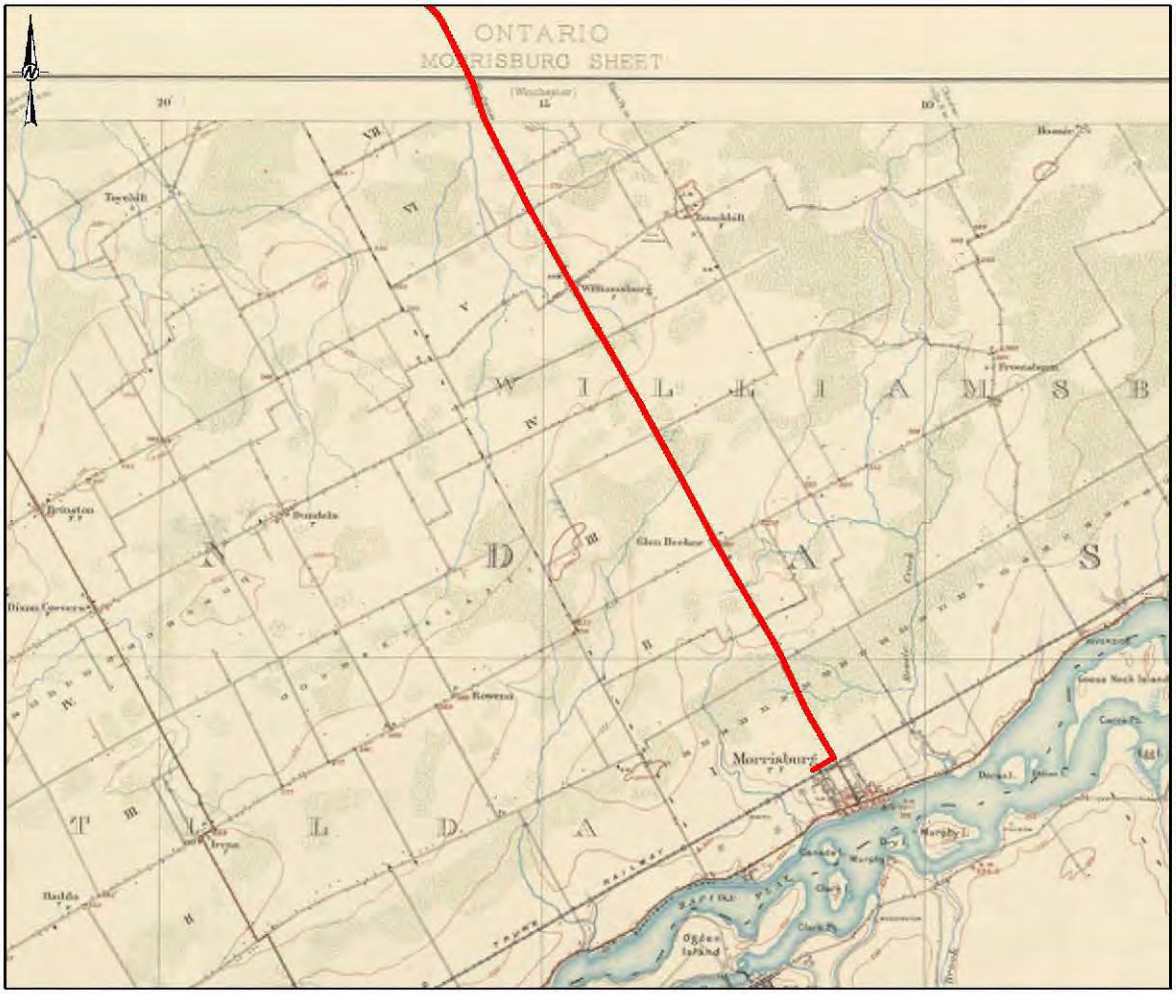
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
1908 TOPOGRAPHIC MAP OF WINCHESTER TOWNSHIP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	5



KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. MORRISBURG, ONTARIO. 1:63,360. MAP SHEET 031B14, [ED. 1], SURVEY DIVISION, DEPARTMENT OF MILITIA AND DEFENCE, 1906
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 625 1,250 2,500
1:25,000 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
1906 TOPOGRAPHIC MAP OF MORRISBURG

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-28
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	6

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448-761, 448-762, 461-762, 462-762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400
1:10,000 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7A

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

DATA SOURCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448 761, 448 762, 461 762, 462 762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

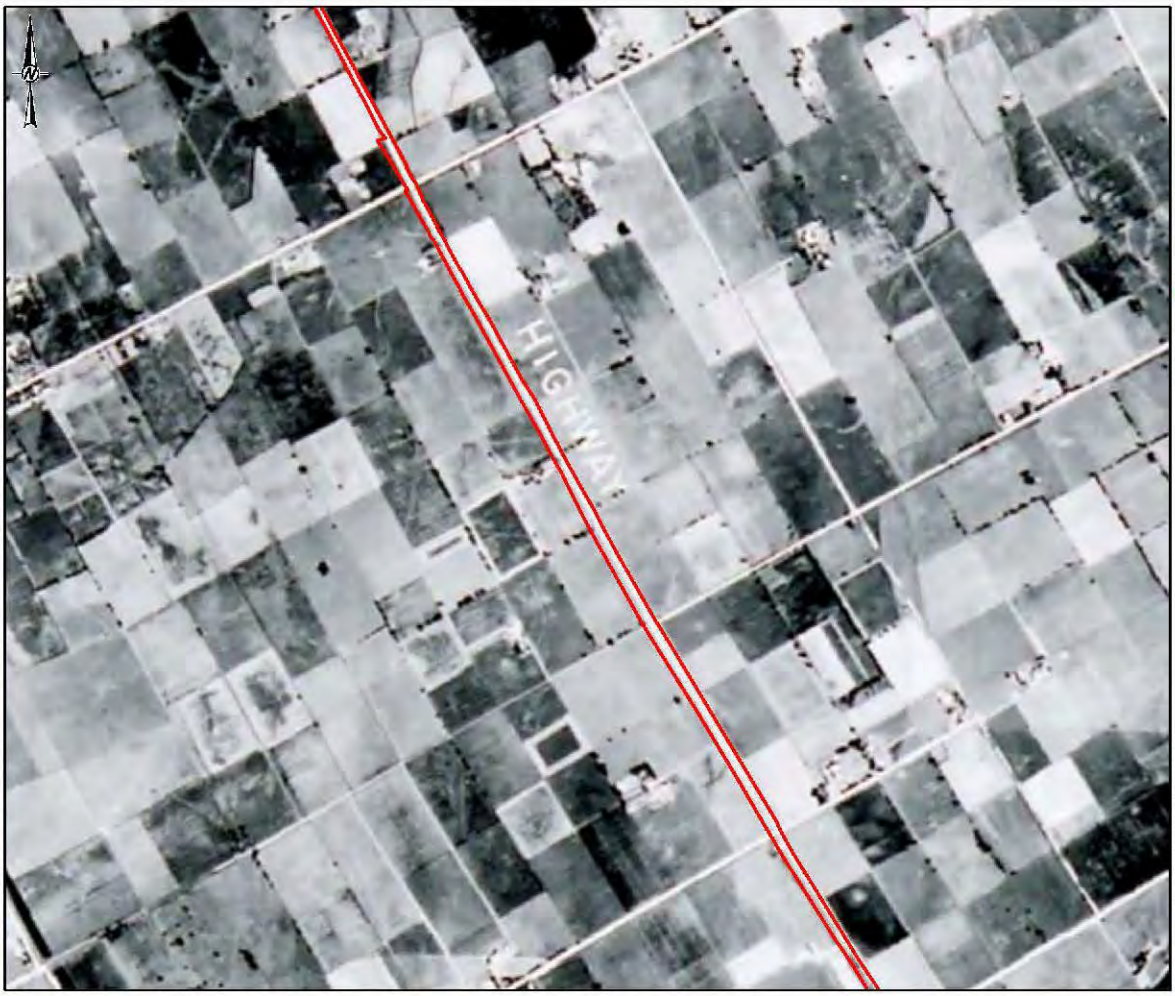
1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7B



KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448.761, 448.763, 461.763, 462.762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7C

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448 761, 448 763, 461 763, 462 762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7D

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448-761, 448-763, 461-763, 462-762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7E

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448 761, 448 763, 461 763, 462 762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

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PROJECT

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TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7F

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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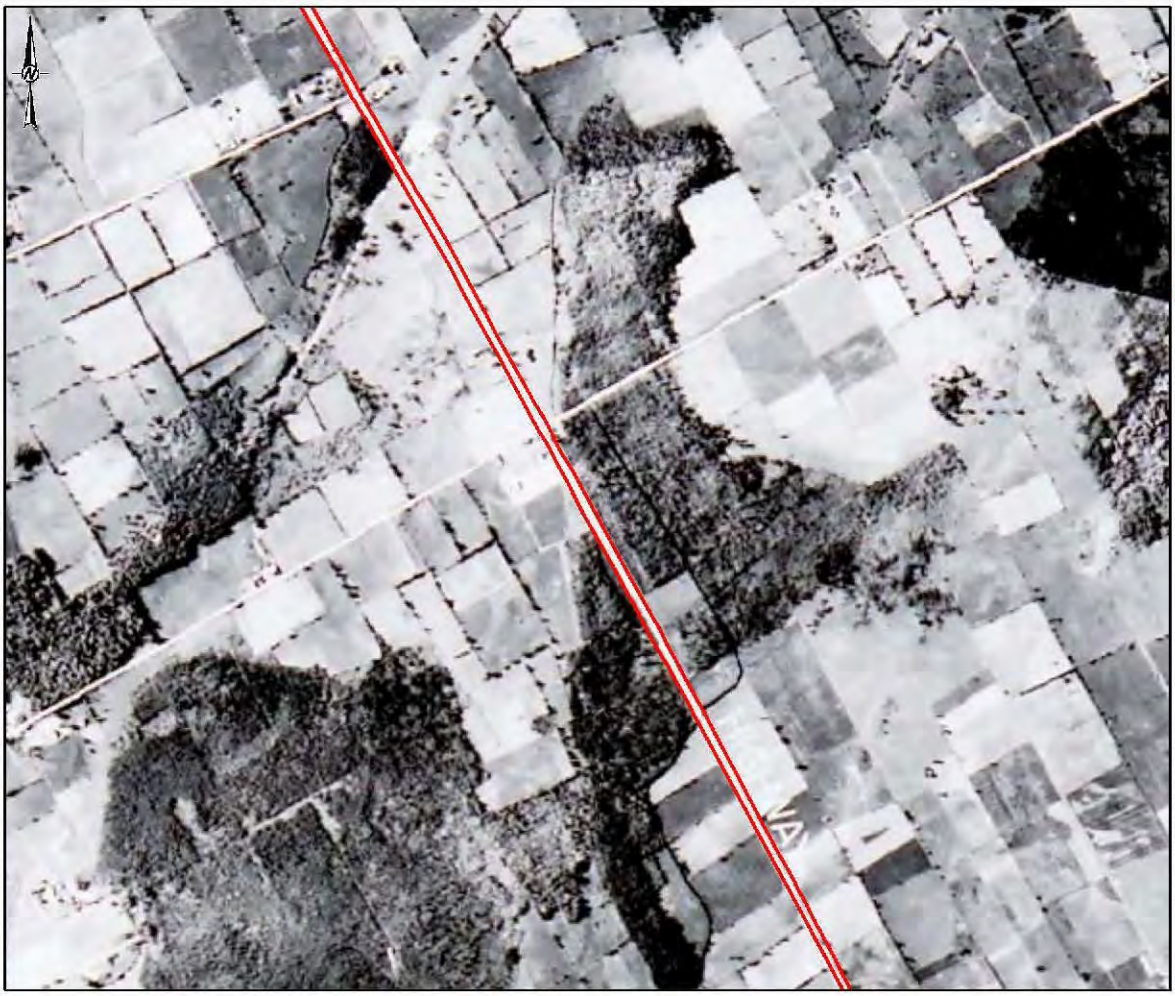
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7G



KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448 761, 448 762, 461 762, 462 762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

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STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	7H

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTES

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCES

1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448.761, 448.763, 461.763, 462.762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400

1:10,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

1954 AERIAL PHOTOGRAPHS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	71

KEY MAP

SCALE 1:500,000

LEGEND

STUDY AREA

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. 1954 SOUTHERN ONTARIO, PHOTO NUMBER - 448 761, 448 762, 461 762, 462 762, DEPARTMENT OF LANDS AND FORESTS, ONTARIO, 1954.
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 100 200 400
1:10,000 METRES

CLIENT
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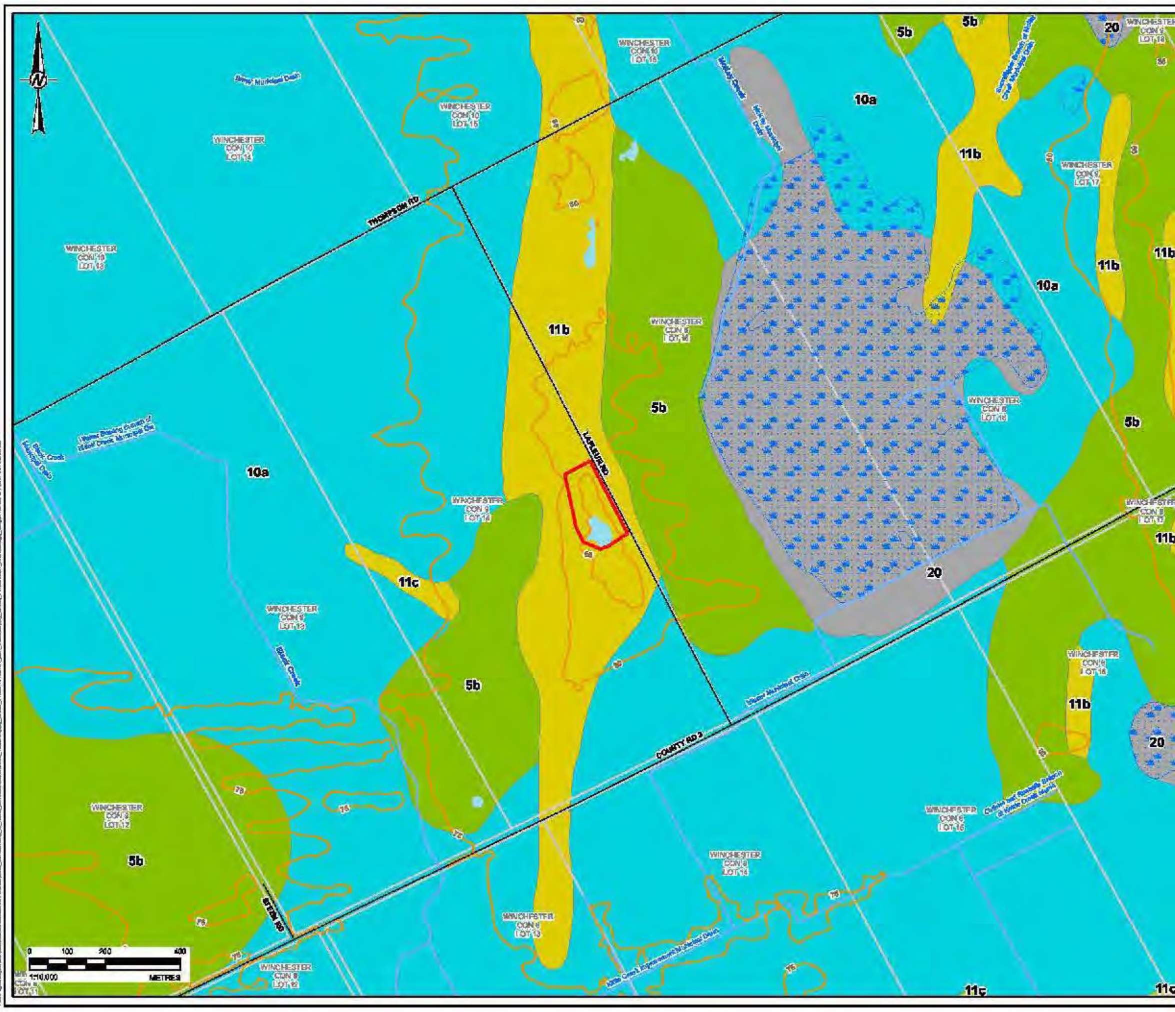

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 10a. FINE-TEXTURED GLACIOMARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL; MASSIVE TO WELL LAMINATED
- 11b. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS
- 11c. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; FORESHORE AND BASINAL DEPOSITS
- 20. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. ONTARIO GEOLOGICAL SURVEY 2010. SURFICIAL GEOLOGY OF SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, MISCELLANEOUS RELEASE--DATA 128-REV
2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
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TITLE

SURFICIAL GEOLOGY

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-28
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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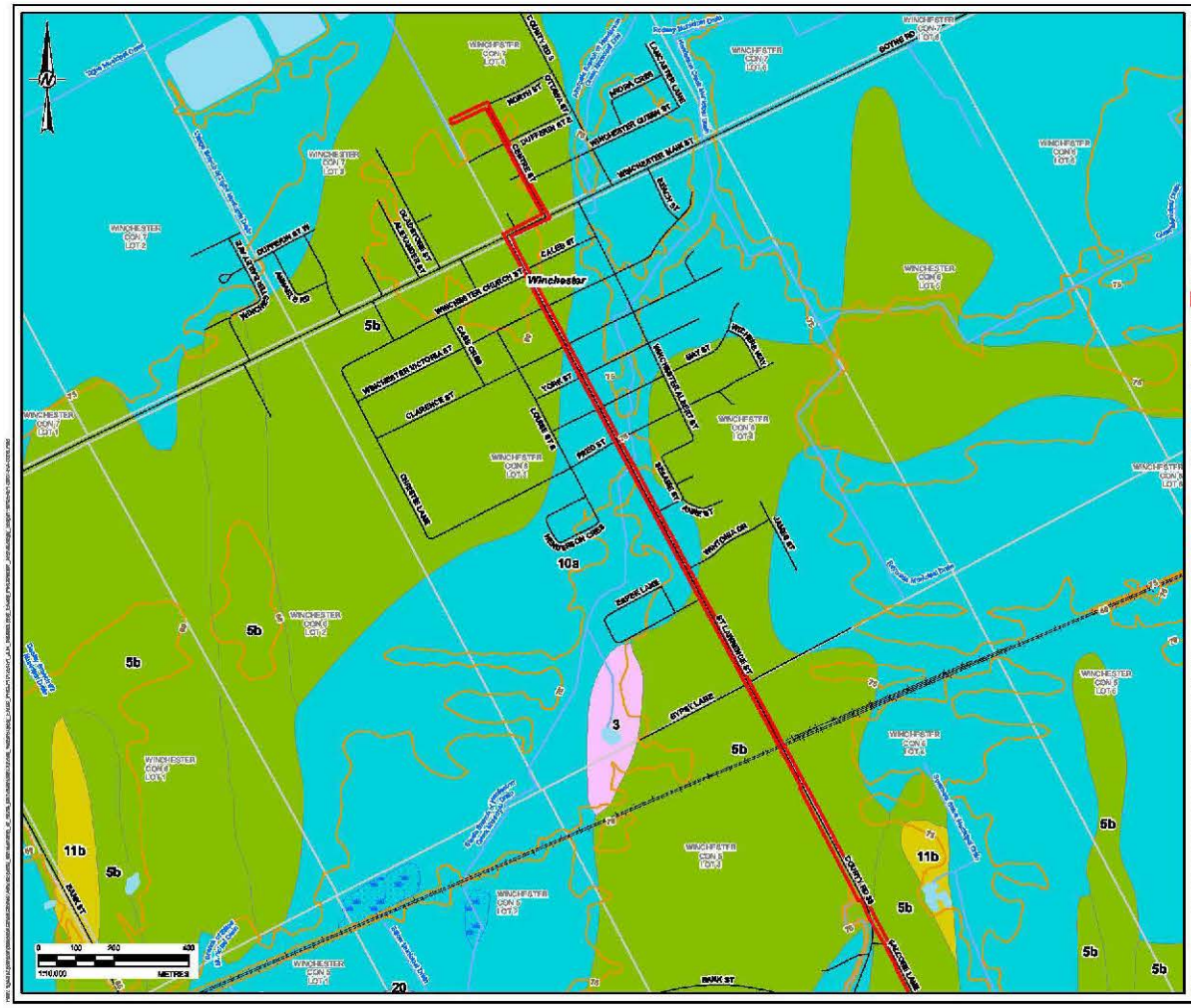

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPVM DATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 2. PALEOZOIC BEDROCK
- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 10a. FINE-TEXTURED GLACIOMARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL; MASSIVE TO WELL LAMINATED
- 11b. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS
- 26. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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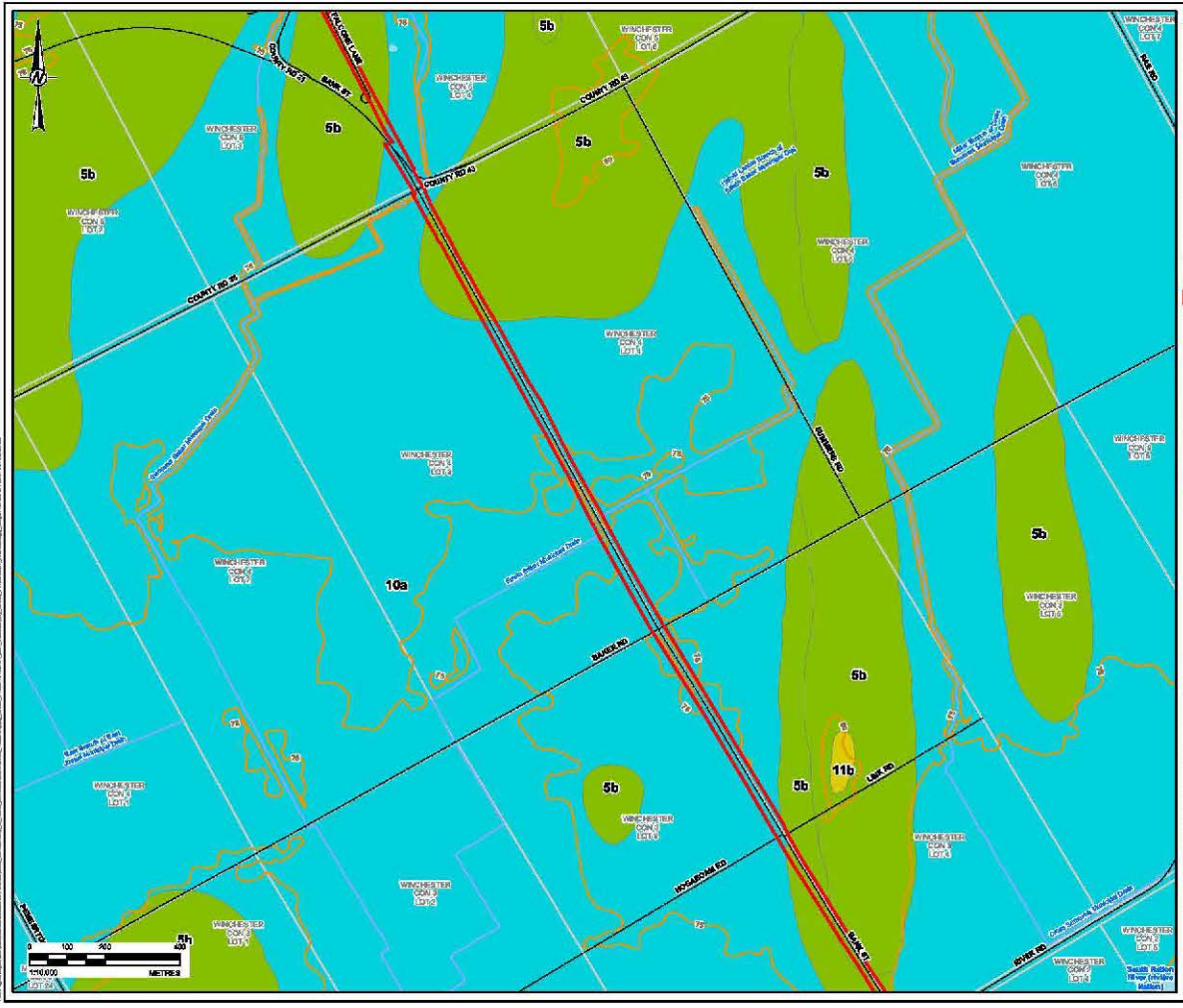

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 5b: TILL; STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 10a: FINE-TEXTURED GLACIOMARINE DEPOSITS; SILT AND CLAY, MINOR SAND AND DRAWN; MASSIVE TO WELL LAMINATED
- 11b: COARSE-TEXTURED GLACIOFLUVIAL DEPOSITS; SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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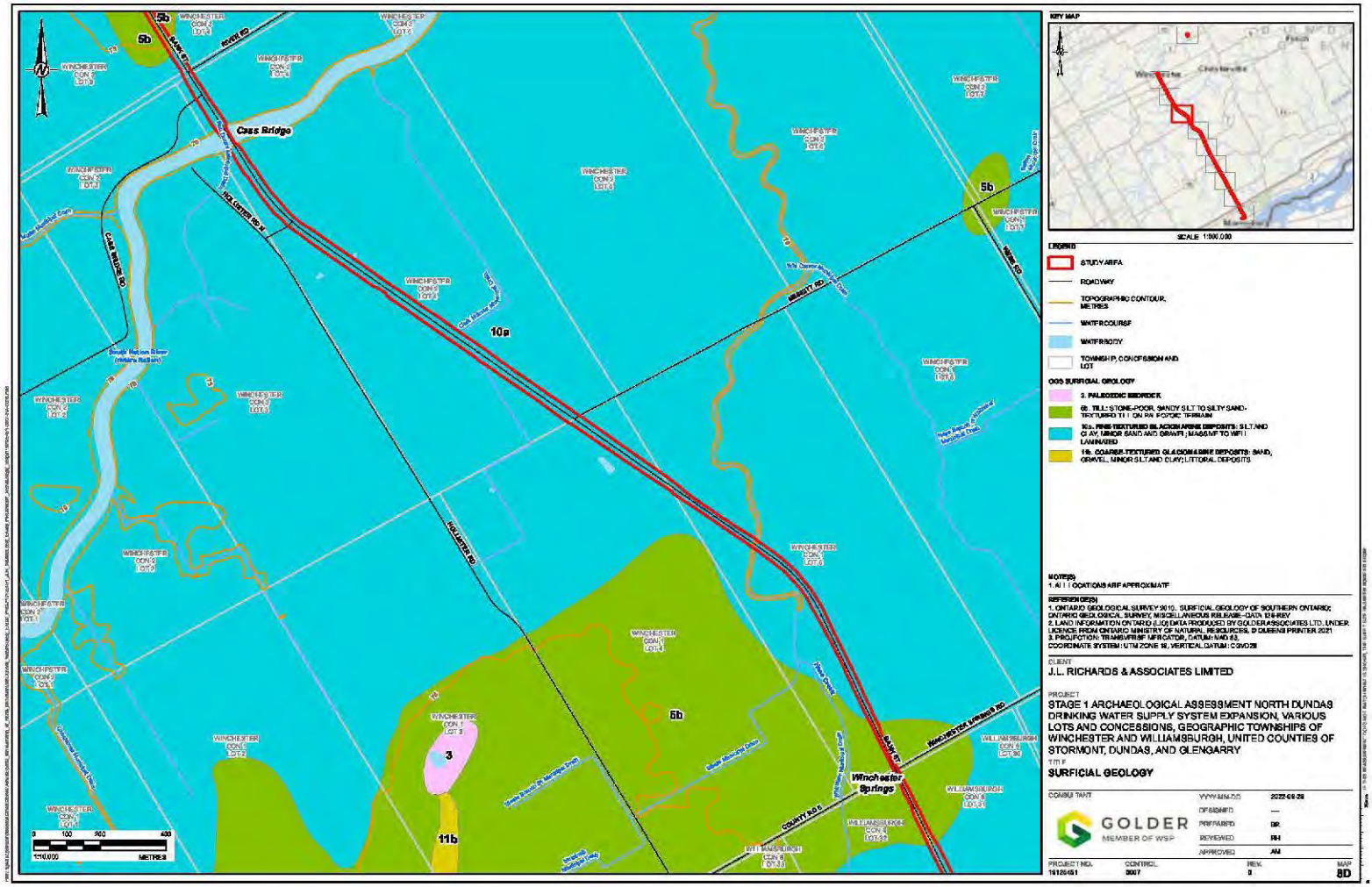

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 2. PALEOZOIC BEDROCK
- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON RAVINED TERRAIN
- 10a. FINE-TEXTURED GLACIOMARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND DRAPE, MASSIVE TO WELL LAMINATED
- 11b. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS

NOTE(S)
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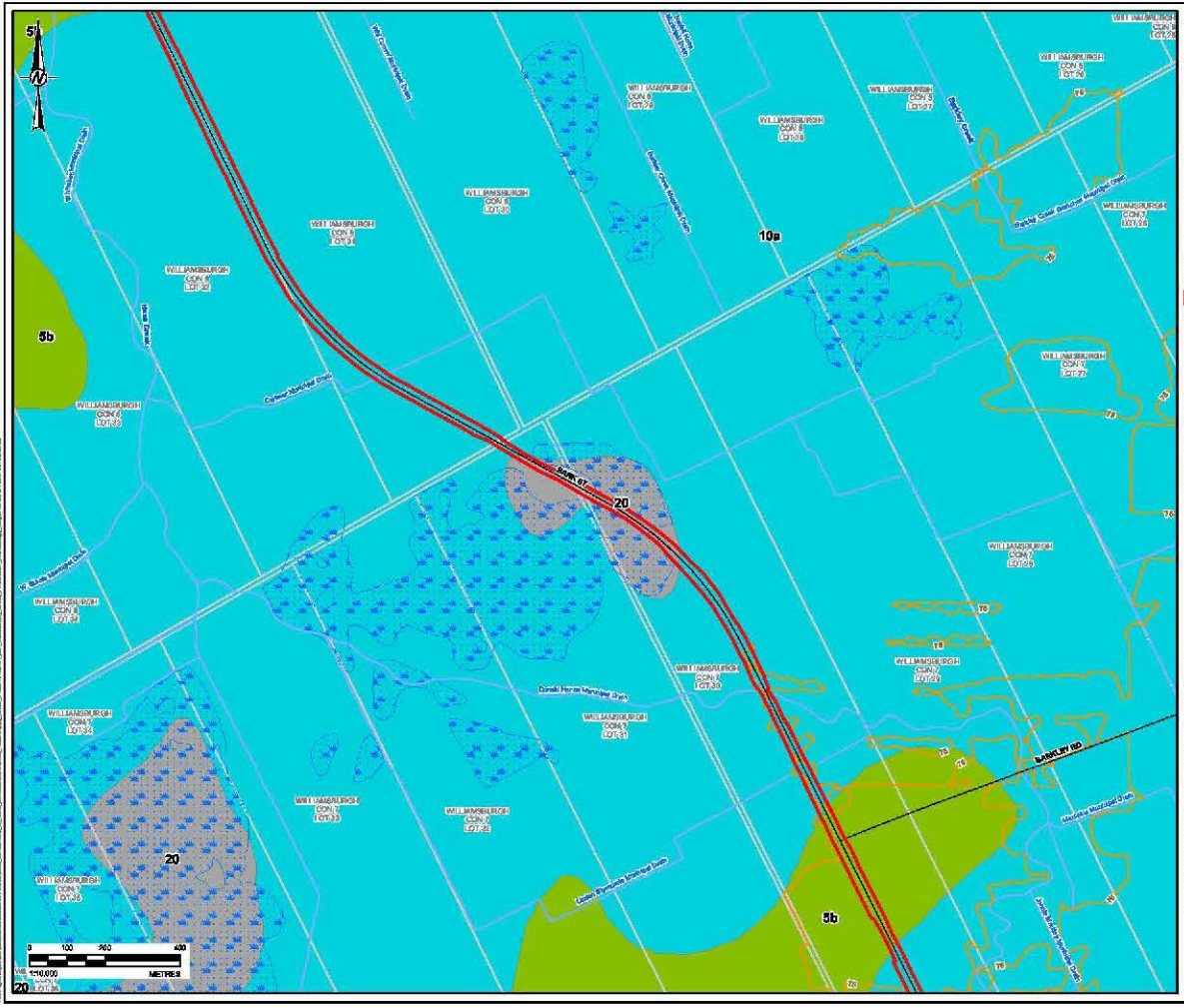

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNPAVILIATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 10a. FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL; MASSIVE TO WELL LAMINATED
- 20. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. ONTARIO GEOLOGICAL SURVEY 2010. SURFICIAL GEOLOGY OF SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, MISCELLANEOUS RELEASE--DATA 128-REV
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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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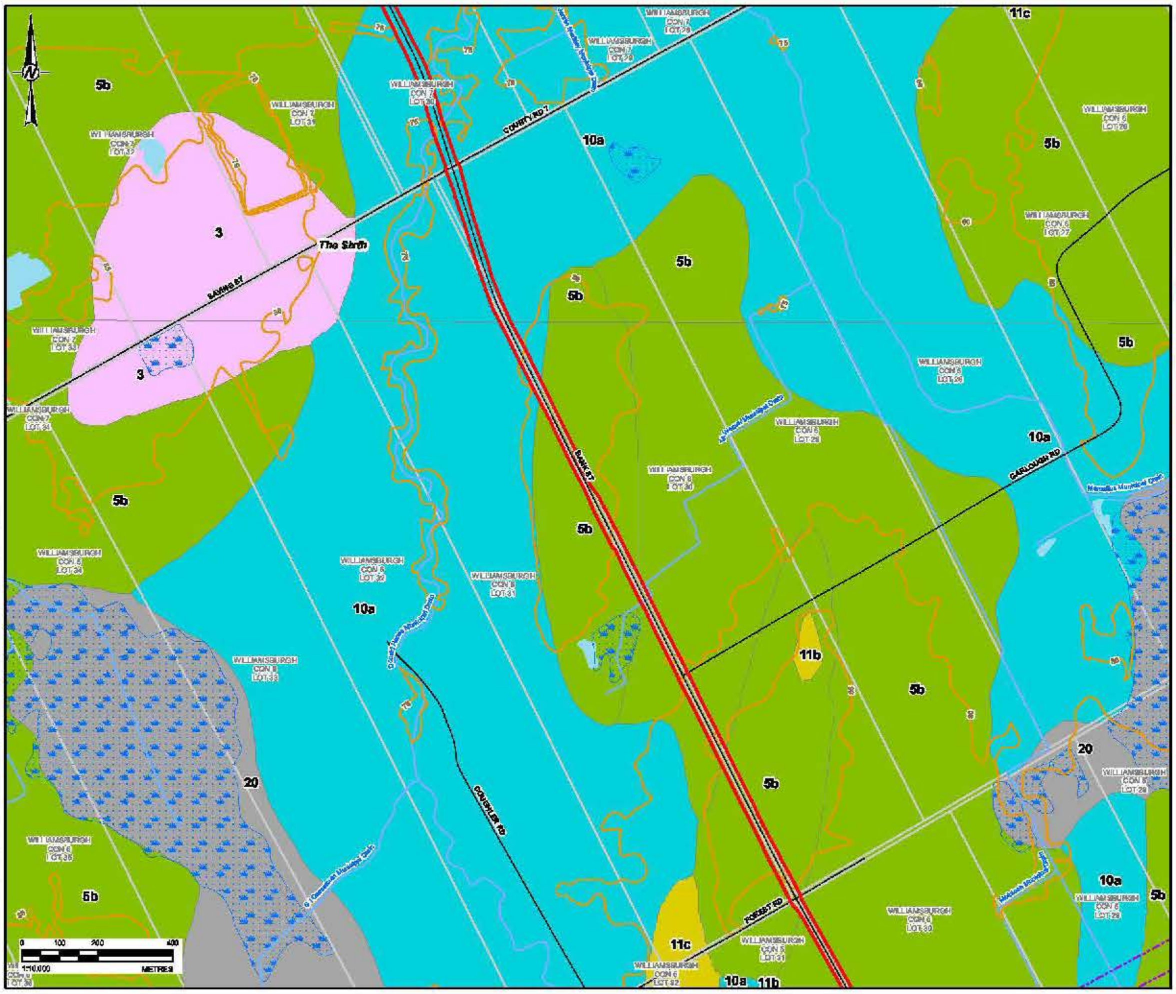

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 3. PALEOZOIC BEDROCK
- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 10a. FINE-TEXTURED GLACIOMARINE DEPOSITS: SILT AND CLAY, MINOR SAND AND GRAVEL; MASSIVE TO WELL LAMINATED
- 11b. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS
- 11c. COARSE-TEXTURED GLACIOMARINE DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; FORESHORE AND BASINAL DEPOSITS
- 20. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)

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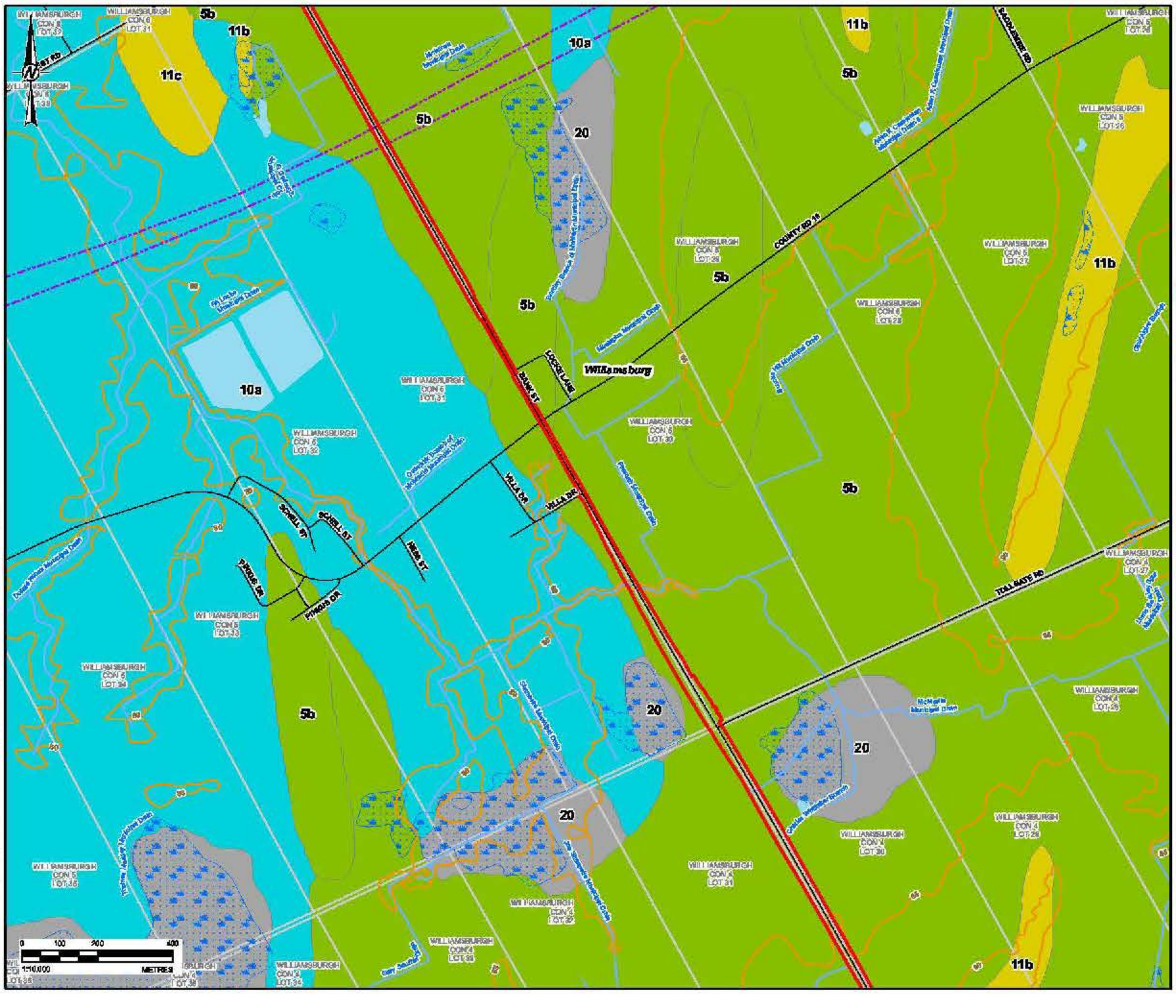

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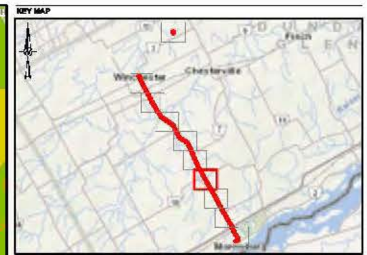

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- **5b. TILL**: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- **10a. FINE-TEXTURED GLACIOMARINE DEPOSITS**: SILT AND CLAY, MINOR SAND AND GRAVEL; MASSIVE TO WELL LAMINATED
- **11b. COARSE-TEXTURED GLACIOMARINE DEPOSITS**: SAND, GRAVEL, MINOR SILT AND CLAY; LITTORAL DEPOSITS
- **11c. COARSE-TEXTURED GLACIOMARINE DEPOSITS**: SAND, GRAVEL, MINOR SILT AND CLAY; FORESHORE AND BASINAL DEPOSITS
- **20. ORGANIC DEPOSITS**: PEAT, MUCK, MARL.

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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TITLE

SURFICIAL GEOLOGY

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-08-29
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PROJECT NO.	CONTROL	REV.	MAP
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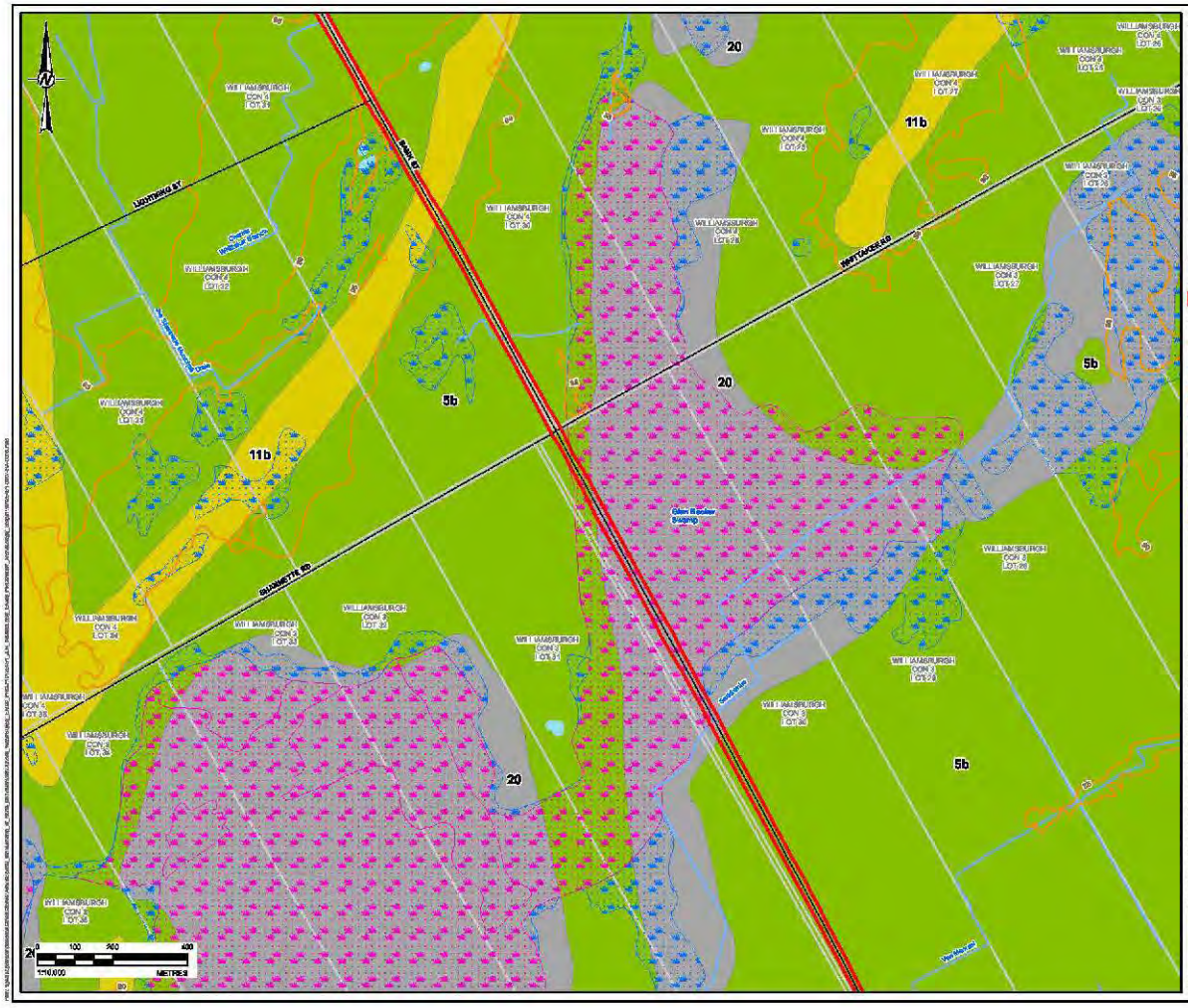

KEY MAP

SCALE 1:500,000

LEGEND

- STUDY AREA
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- WATER BODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 11b. COARSE-TEXTURED GLACIOFLUVIAL DEPOSITS: SAND, GRAVEL, MINOR SILT AND CLAY; UNDIFFERENTIATED DEPOSITS
- 20. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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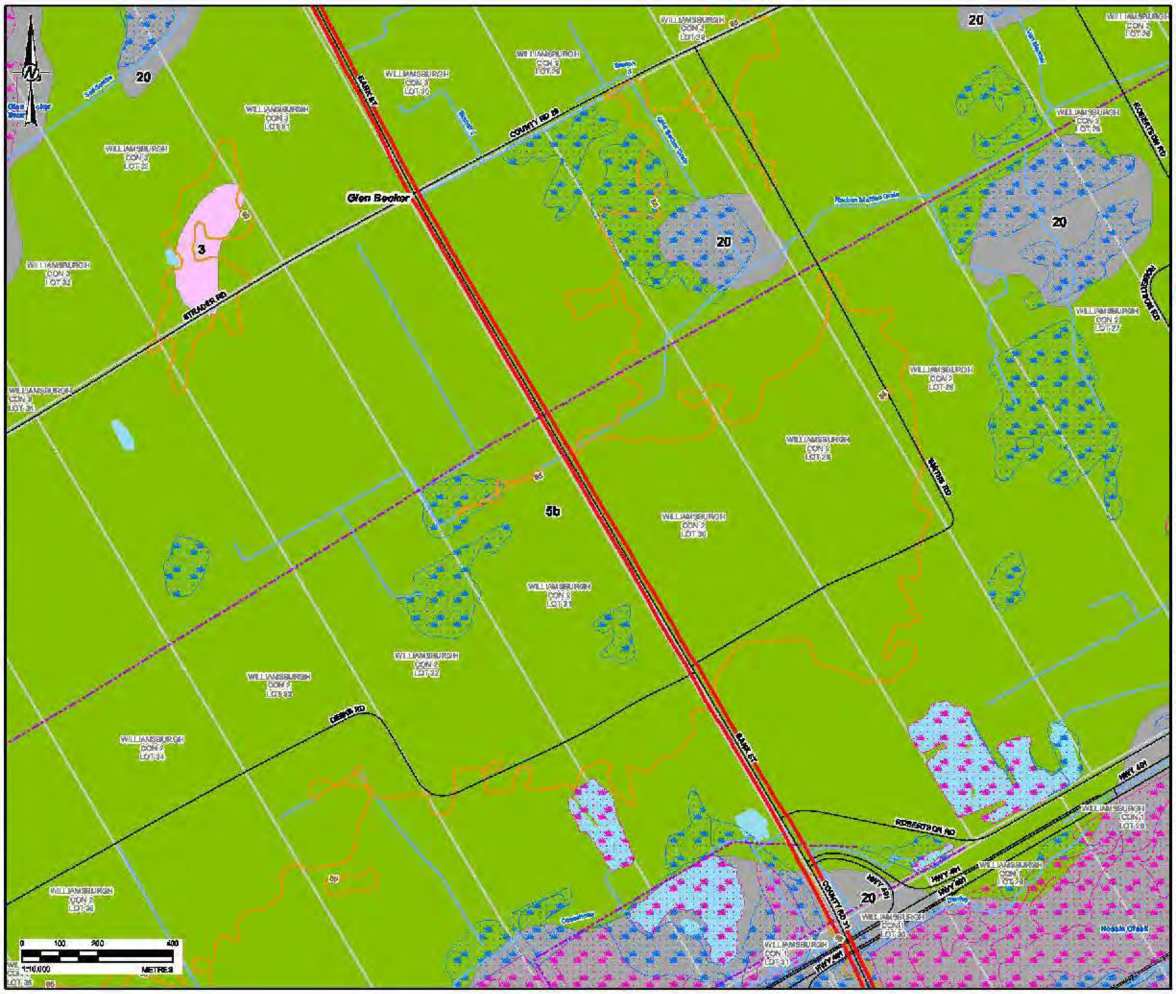

KEY MAP

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LEGEND

- STUDY AREA
- ROADWAY
- UTILITY LINE
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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- EVALUATED-PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

OGS SURFICIAL GEOLOGY

- 3. PALEOZOIC BEDROCK
- 5b. TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 20. ORGANIC DEPOSITS: PEAT, MUCK, MARL

NOTE(S)

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GOLDER MEMBER OF WSP

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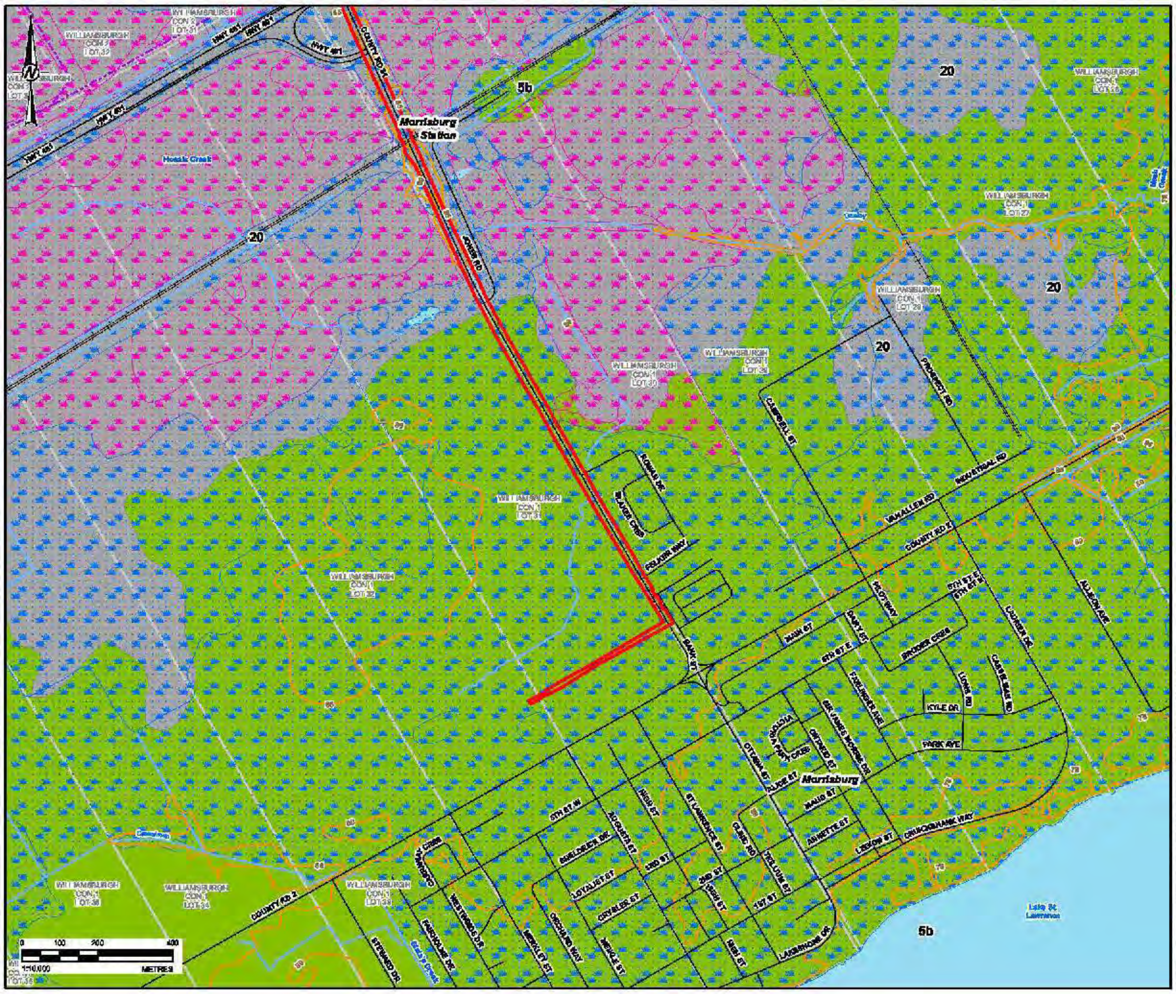

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OGS SURFICIAL GEOLOGY

- 5b : TILL: STONE-POOR, SANDY SILT TO SILTY SAND-TEXTURED TILL ON PALEOZOIC TERRAIN
- 20 : ORGANIC DEPOSITS: PEAT, MUCK, MARL

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J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

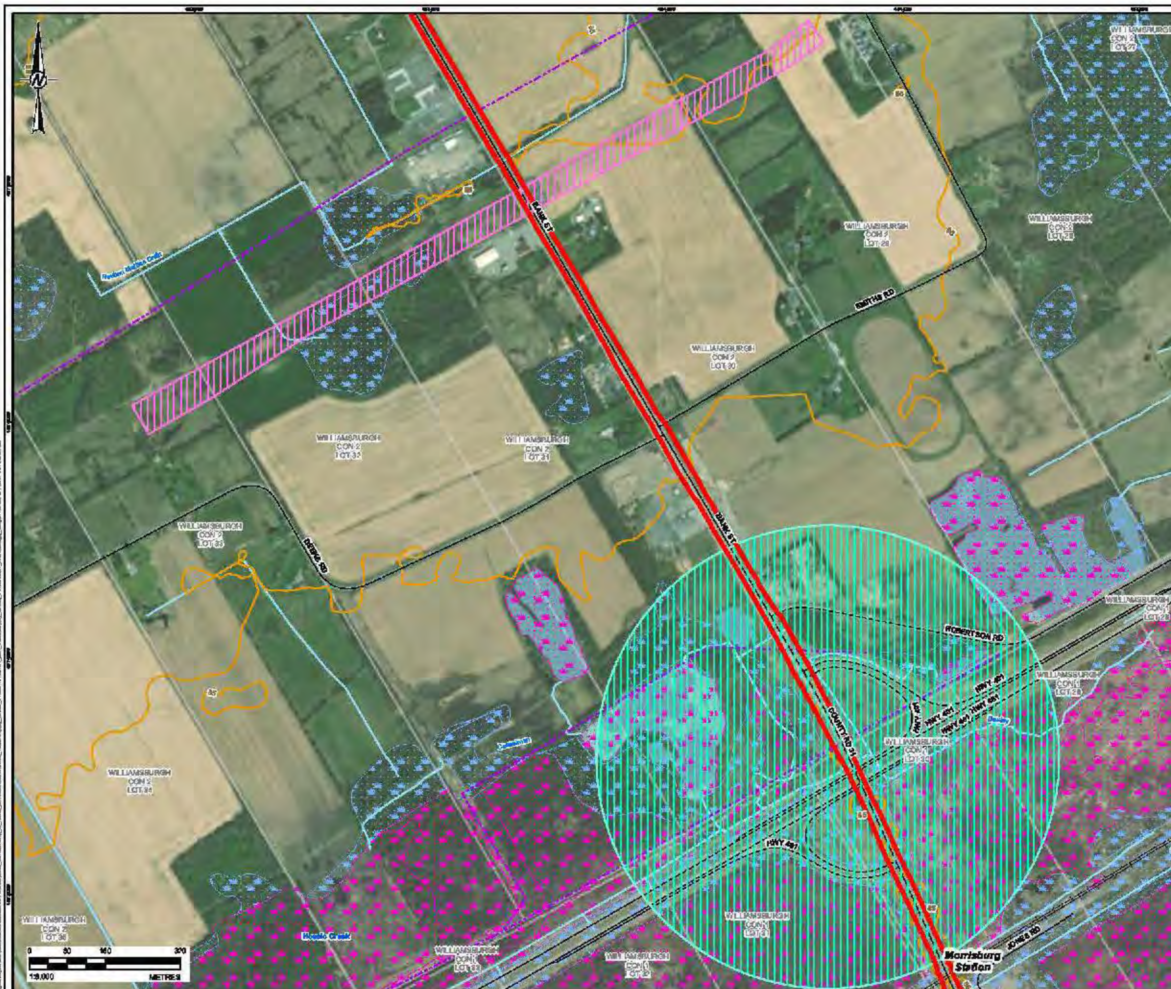
SURFICIAL GEOLOGY

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	6J



KEY MAP

SCALE 1:300,000

LEGEND

STUDY AREA

PREVIOUS ARCHAEOLOGICAL ASSESSMENTS

GOLDER 2016 (P340-0059-2016)

P361-0017-2014

ROADWAY

UTILITY LINE

RAILROAD

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

UNEVALUATED PROVINCIAL WETLAND

EVALUATED-PROVINCIAL WETLAND

WATERBODY

TOWNSHIP, CONCESSION AND LOT

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE.

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

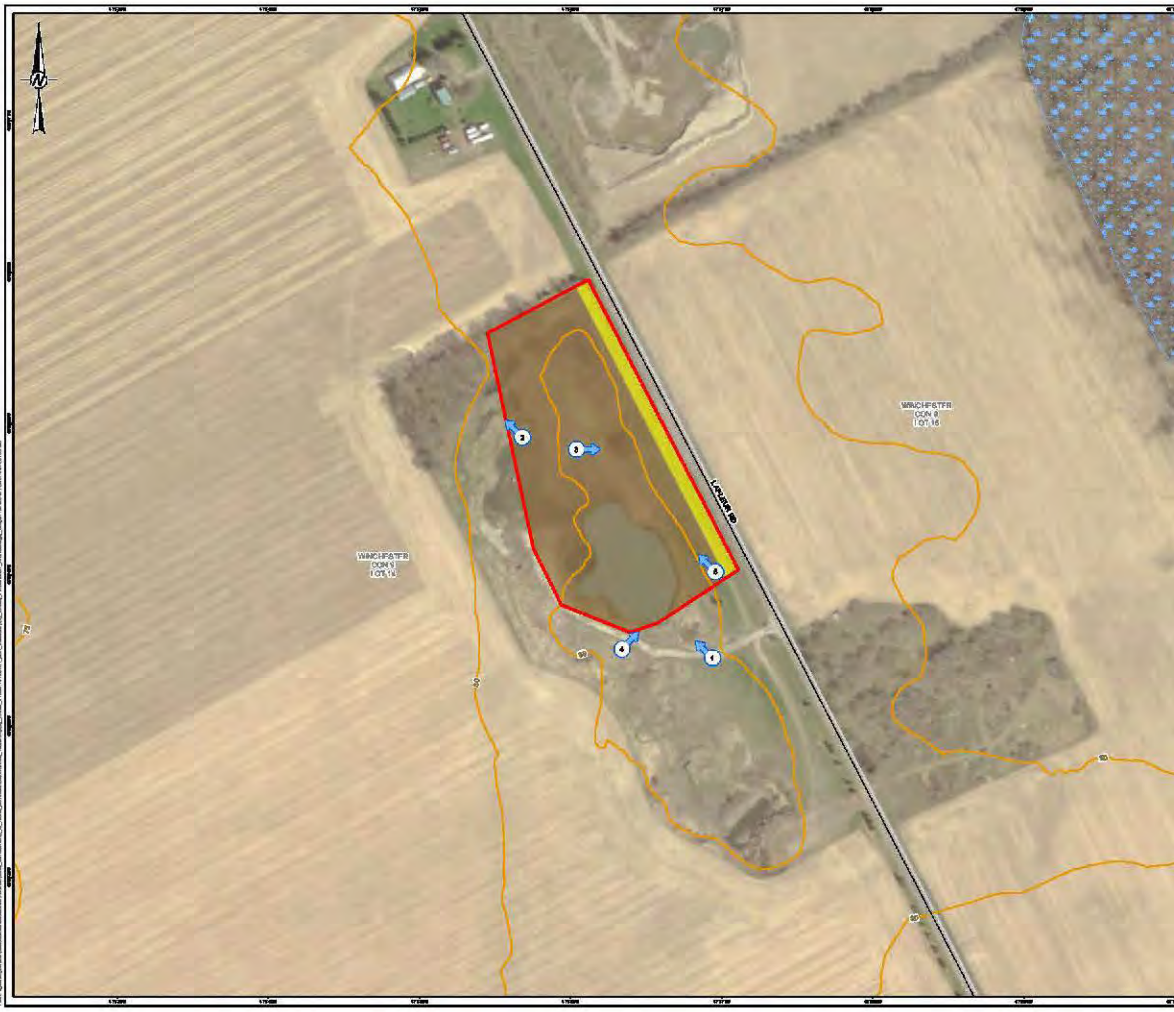
PREVIOUS ARCHAEOLOGICAL ASSESSMENTS WITHIN 50 METRES

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	9



KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

ROADWAY

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

UNEVALUATED PROVINCIAL WETLAND

WATERBODY

TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100

1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	**10A**

KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

ROADWAY

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

TOWNSHIP, CONCESSION AND LOT

NOTE(S)

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0 25 50 100

1:2,500 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10B

KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

DISTURBED

ROADWAY

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10C


KEY MAP
SCALE 1:875,000
LEGEND
PHOTO LOCATION AND DIRECTION
STUDY AREA
ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
DISTURBED
ROADWAY
RAILROAD
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
WATERBODY
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
REFERENCE(S)
1. LAND INFORMATION ONTARIO © (C) DATA PRODUCED BY GOLDER ASSOCIATES LTD., UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021.
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0 25 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 10D

KEY MAP

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT: GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-28
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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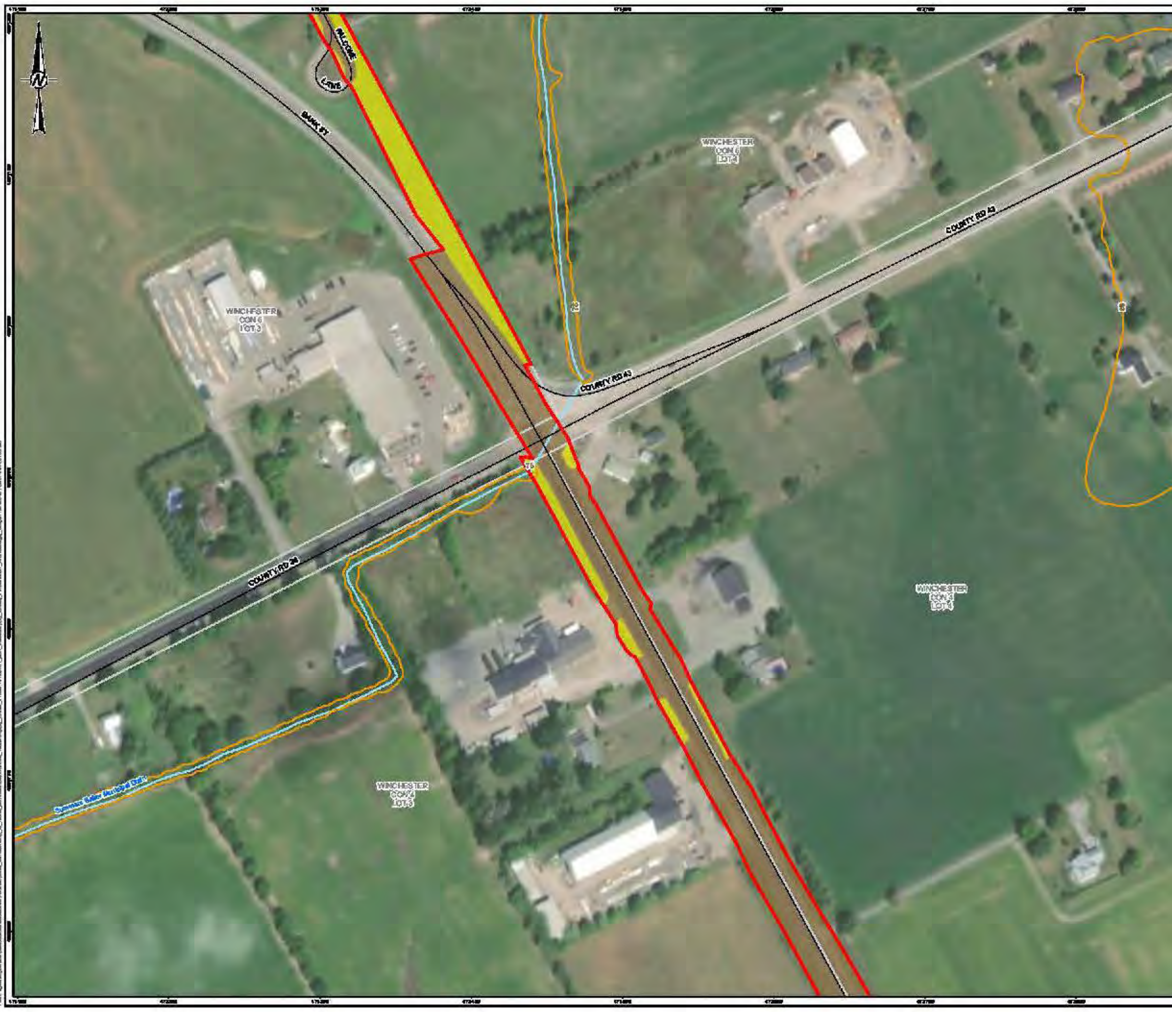

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 25 50 100

1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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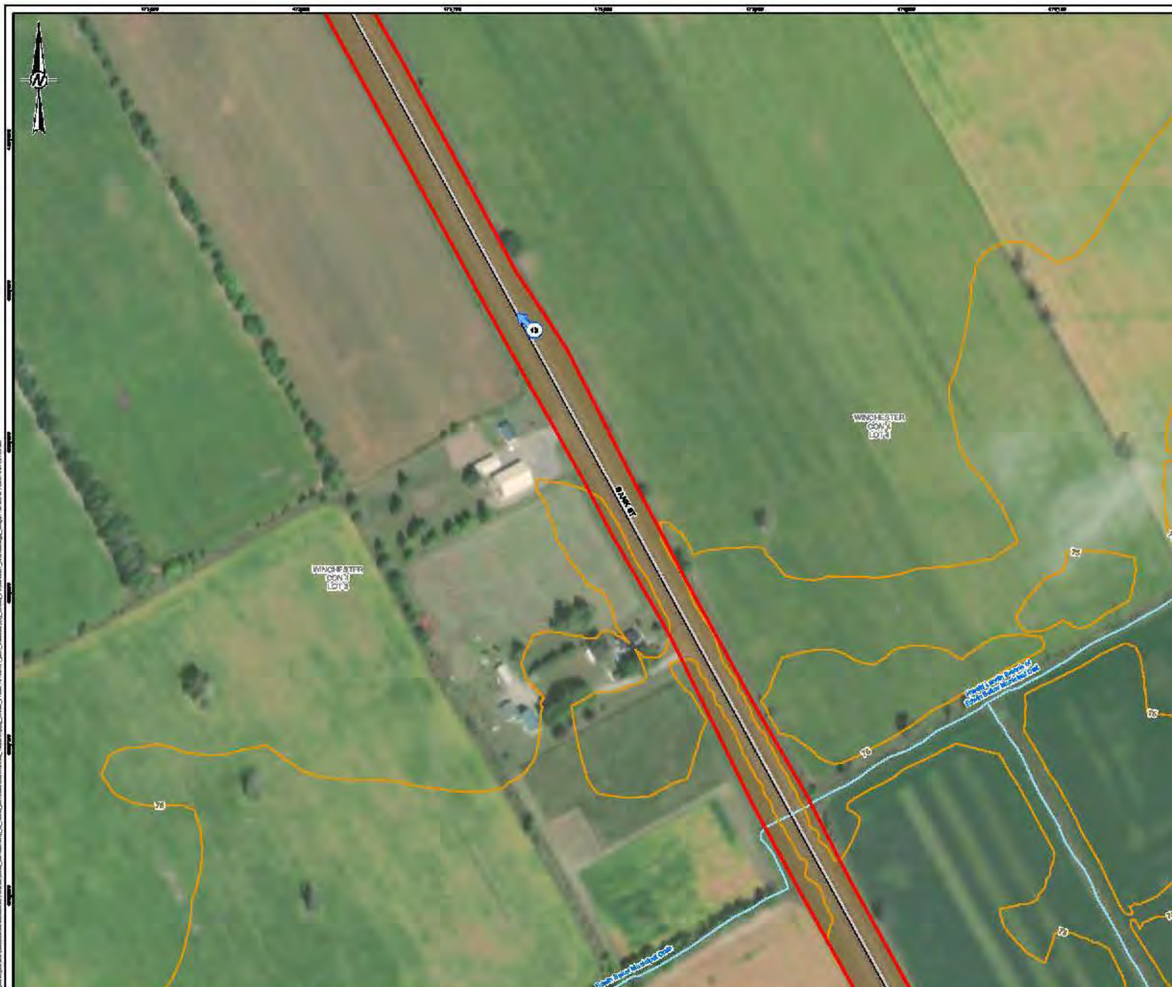

KEY MAP

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10G

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10H

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
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0 25 50 100
1:2,500 METRES

CLIENT
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TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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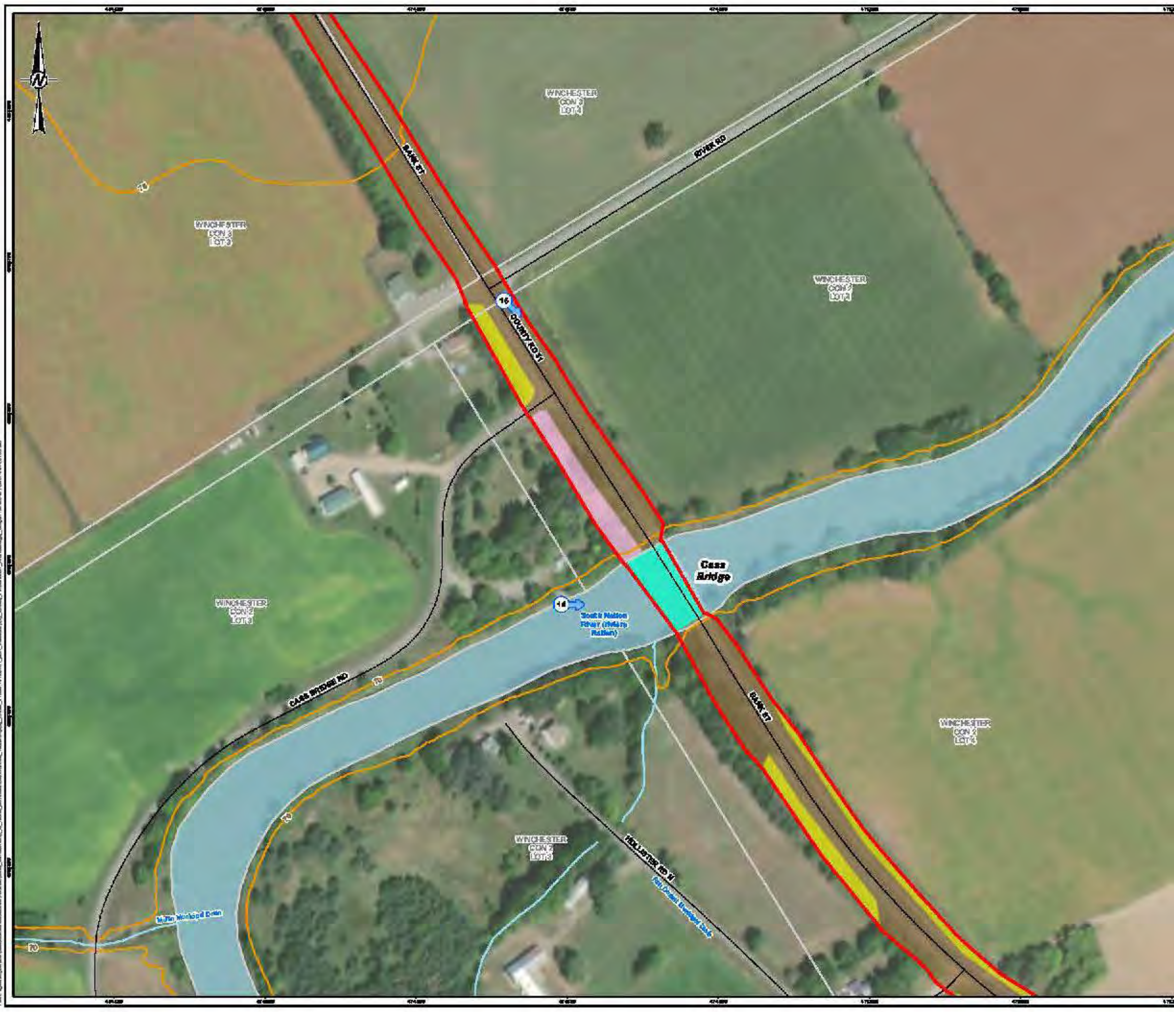

KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

PERMANENTLY WET

SLOPED

ROADWAY

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

WATERBODY

TOWNSHIP, CONCESSION AND LOT

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0 25 50 100

1:2,500 METRES

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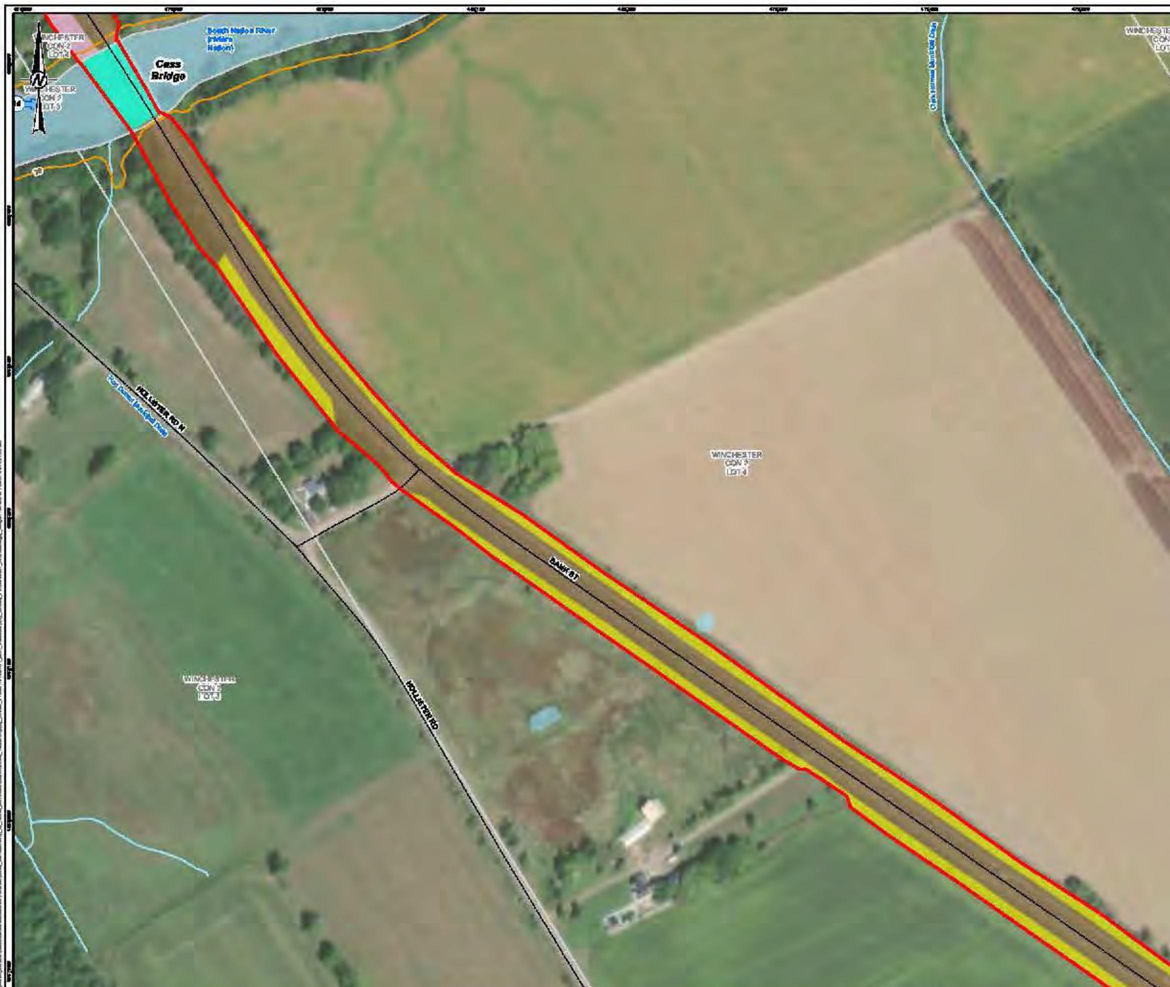

KEY MAP

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LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

PERMANENTLY WET

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TOPOGRAPHIC CONTOUR, METRES

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0 25 50 100
1:2,500 METRES

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STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

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GOLDER
MEMBER OF WSP

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PROJECT NO.	CONTROL	REV.	MAP
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KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
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- ROADWAY
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0 25 50 100

1:2,500 METRES

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STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

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PROJECT NO.	CONTROL	REV.	MAP
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KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
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0 25 50 100
1:2,500 METRES

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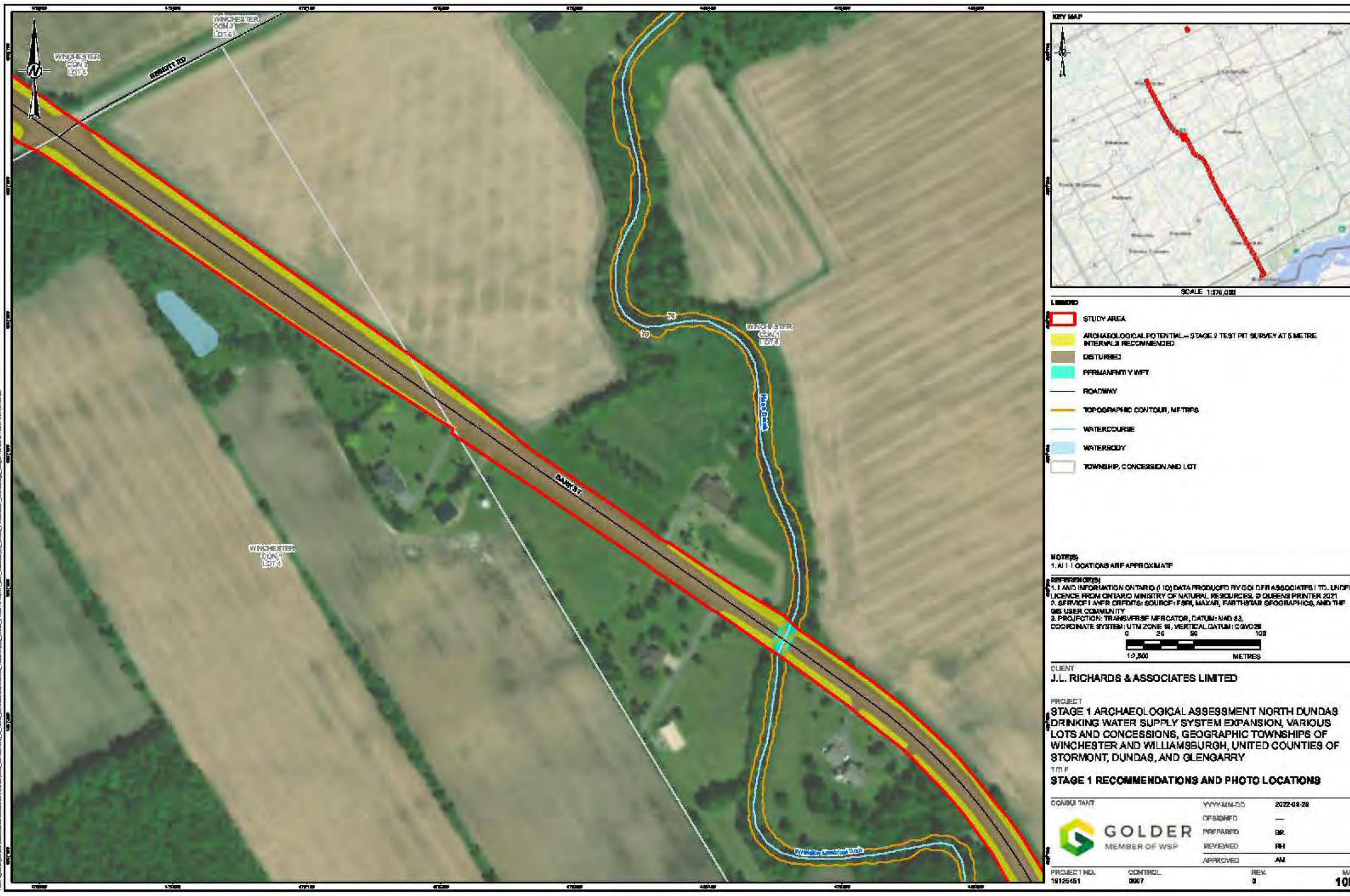

LEGEND

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- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- PERMANENTLY WET
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- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100

1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

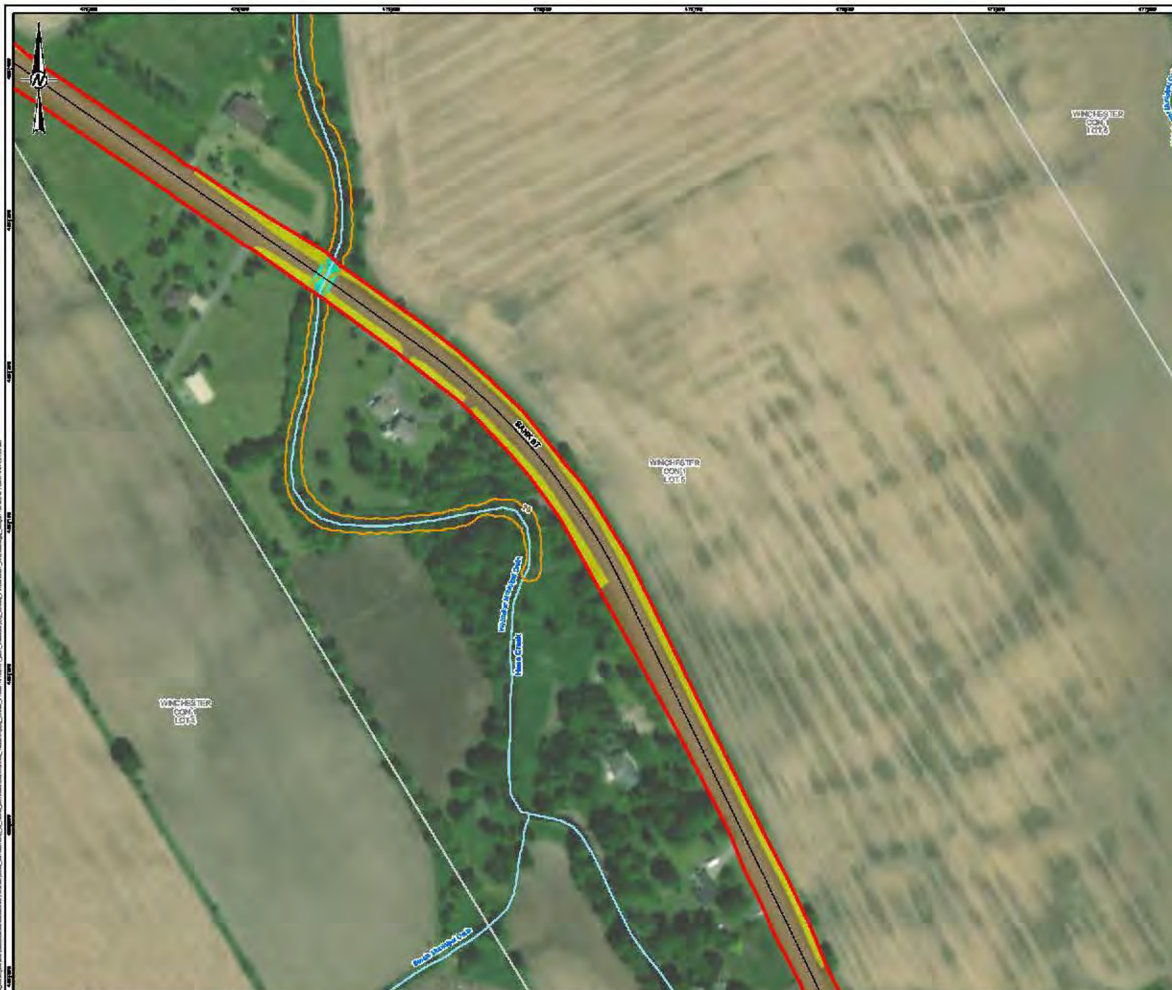
TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10N



KEY MAP

SCALE 1:376,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- PERMANENTLY WET
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

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STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-28
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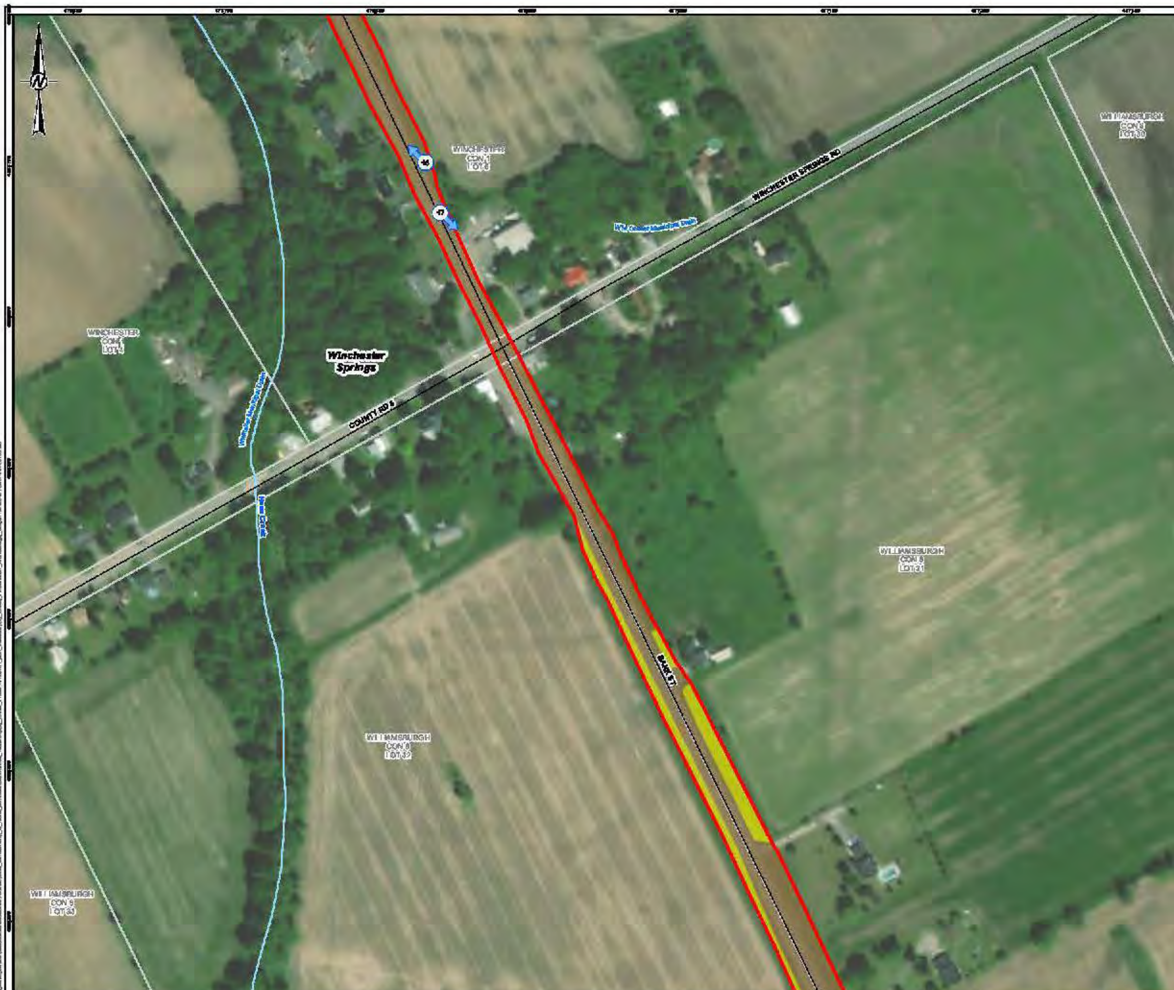
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	100



KEY MAP

SCALE 1:375,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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REFERENCE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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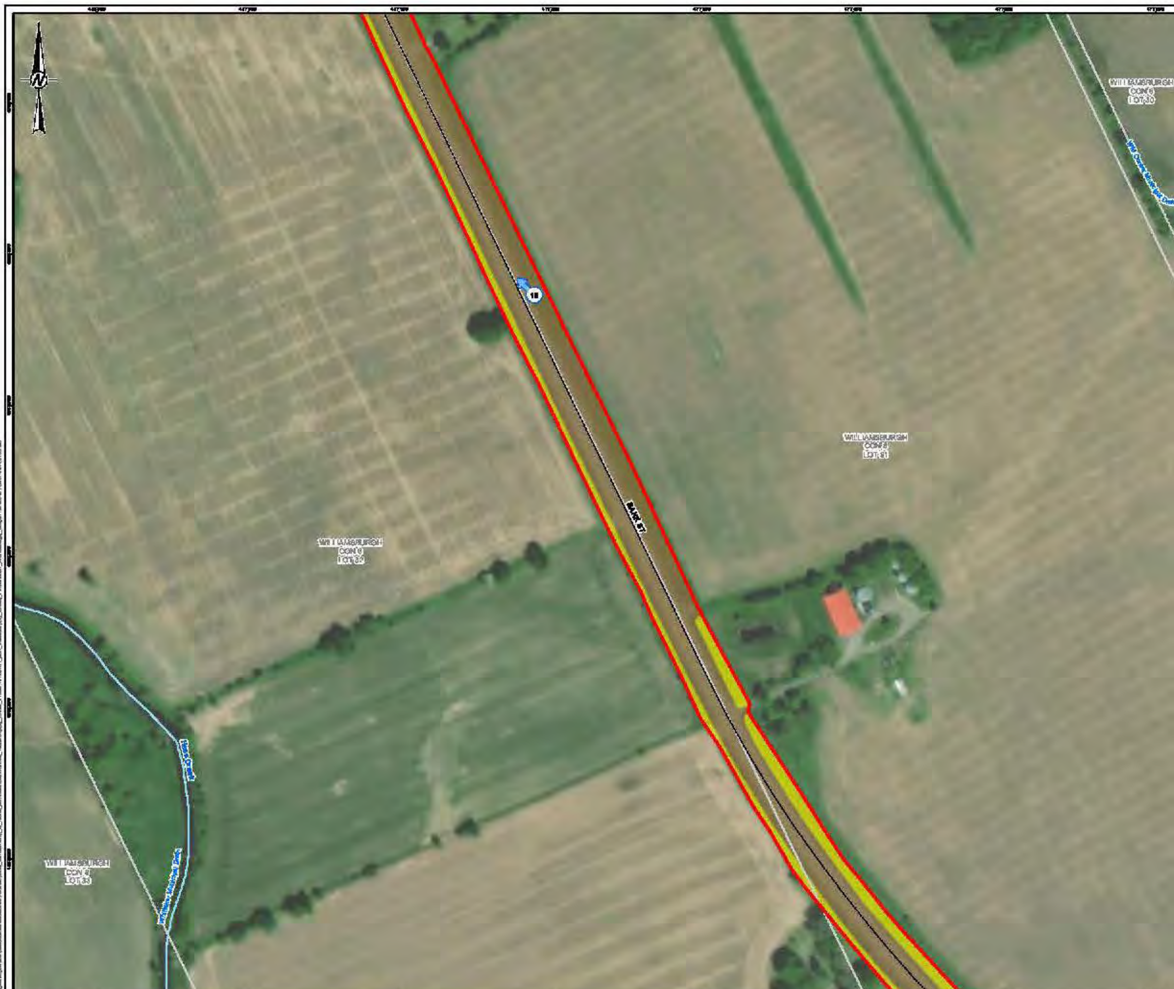

KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

ROADWAY

WATERCOURSE

TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100

1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-28
DESIGNED	—
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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10Q

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

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APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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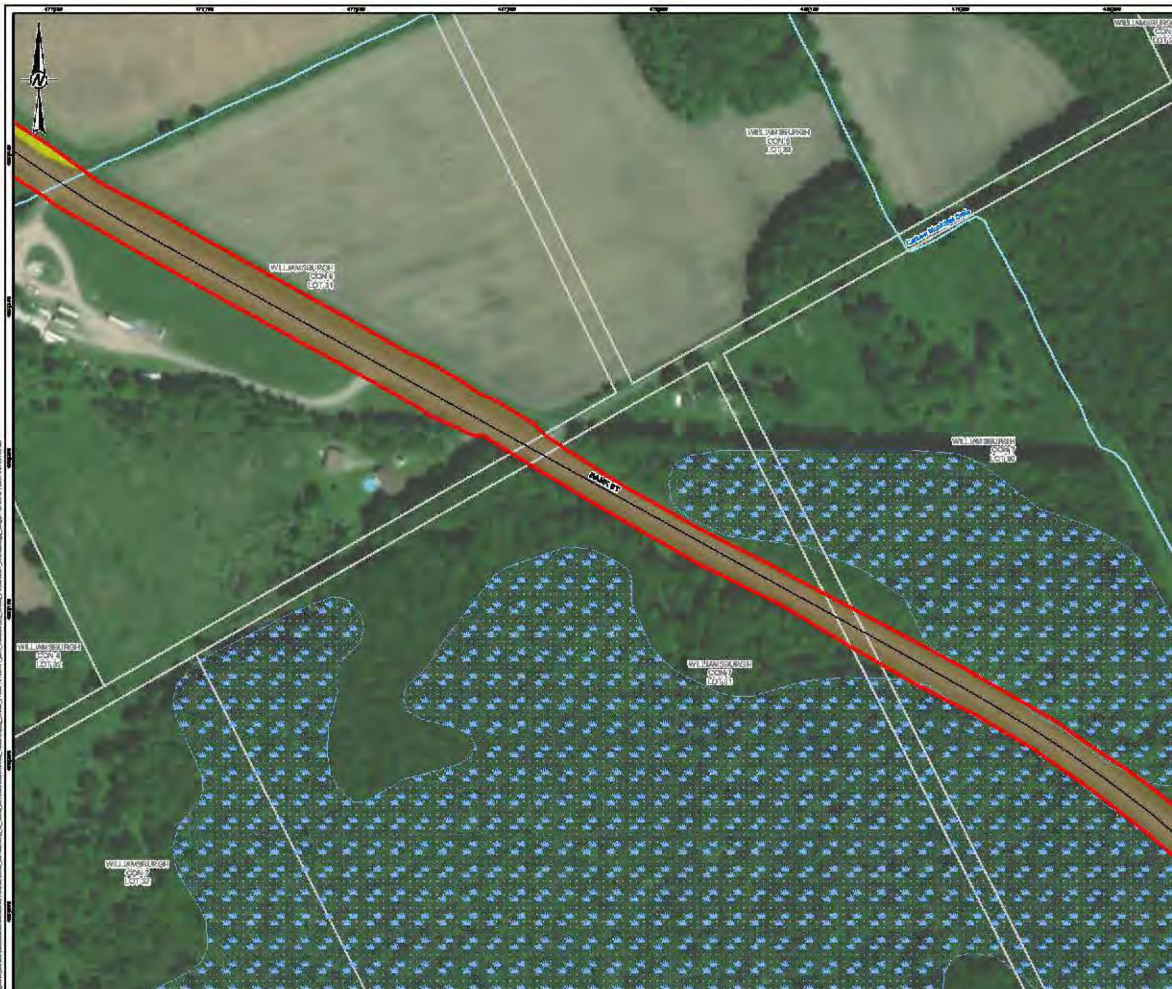

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)

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0 25 50 100

1:2,500 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE

STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10S

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10T

KEY MAP

SCALE 1:1,875,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- PERMANENTLY WET
- SLOPED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021.
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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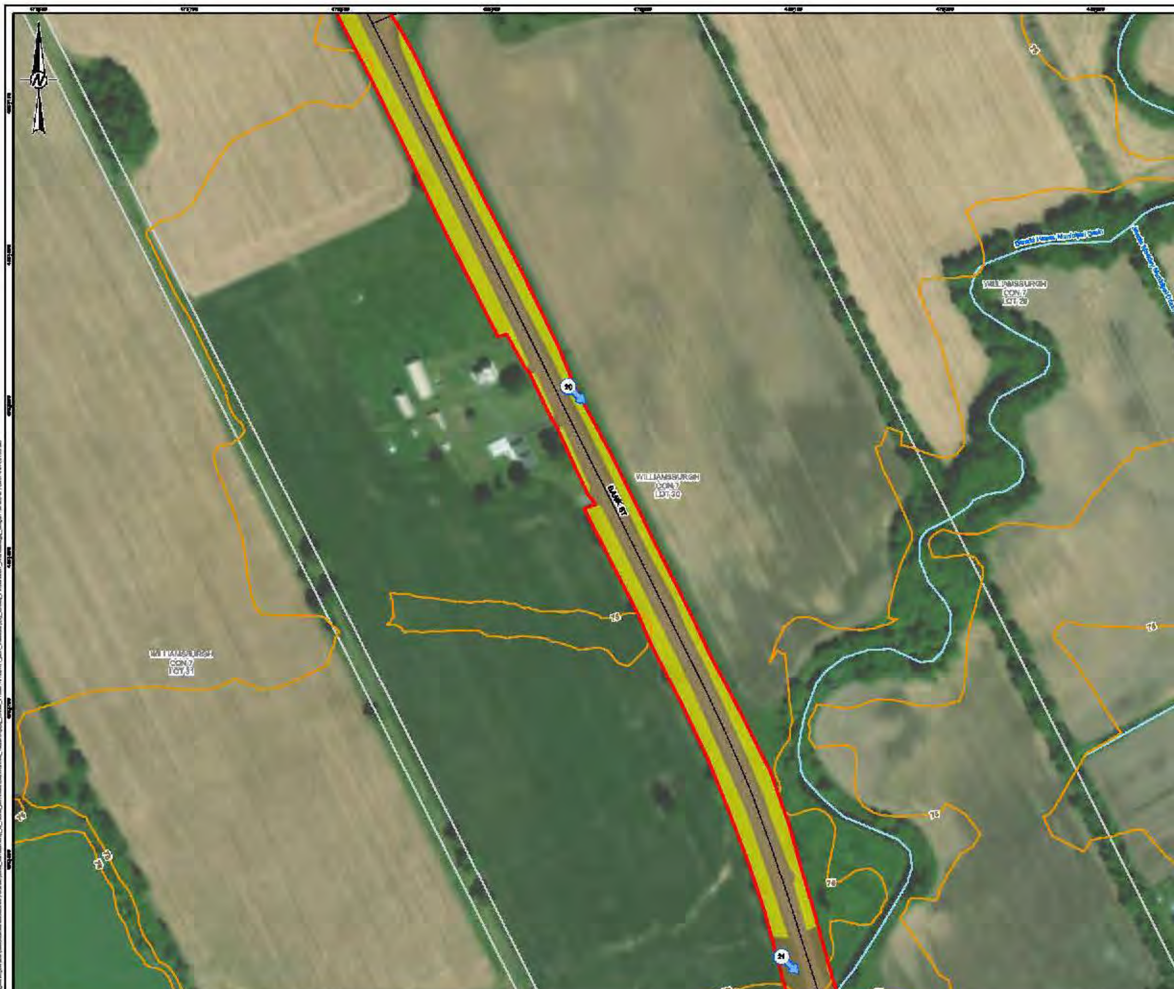

KEY MAP

SCALE 1:376,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- PERMANENTLY WET
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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REFERENCE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER MEMBER OF WSP

YYYY-MM-DD	2022-06-28
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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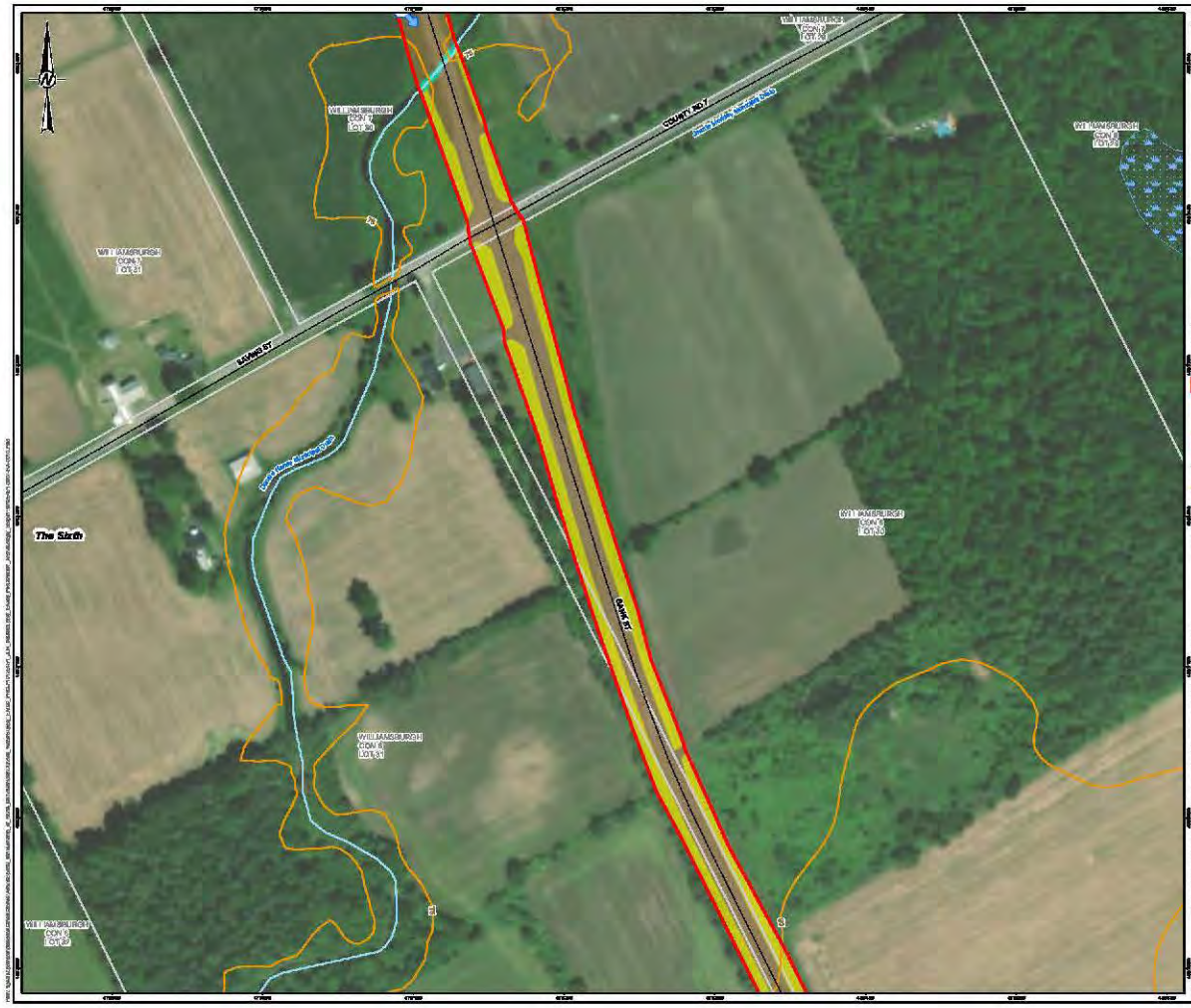

KEY MAP

SCALE 1:875,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- PERMANENTLY WET
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LIO AND INFORMATION ONTARIO © [0] DATA PRODUCED BY GOLDER ASSOCIATES LTD., UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500
METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
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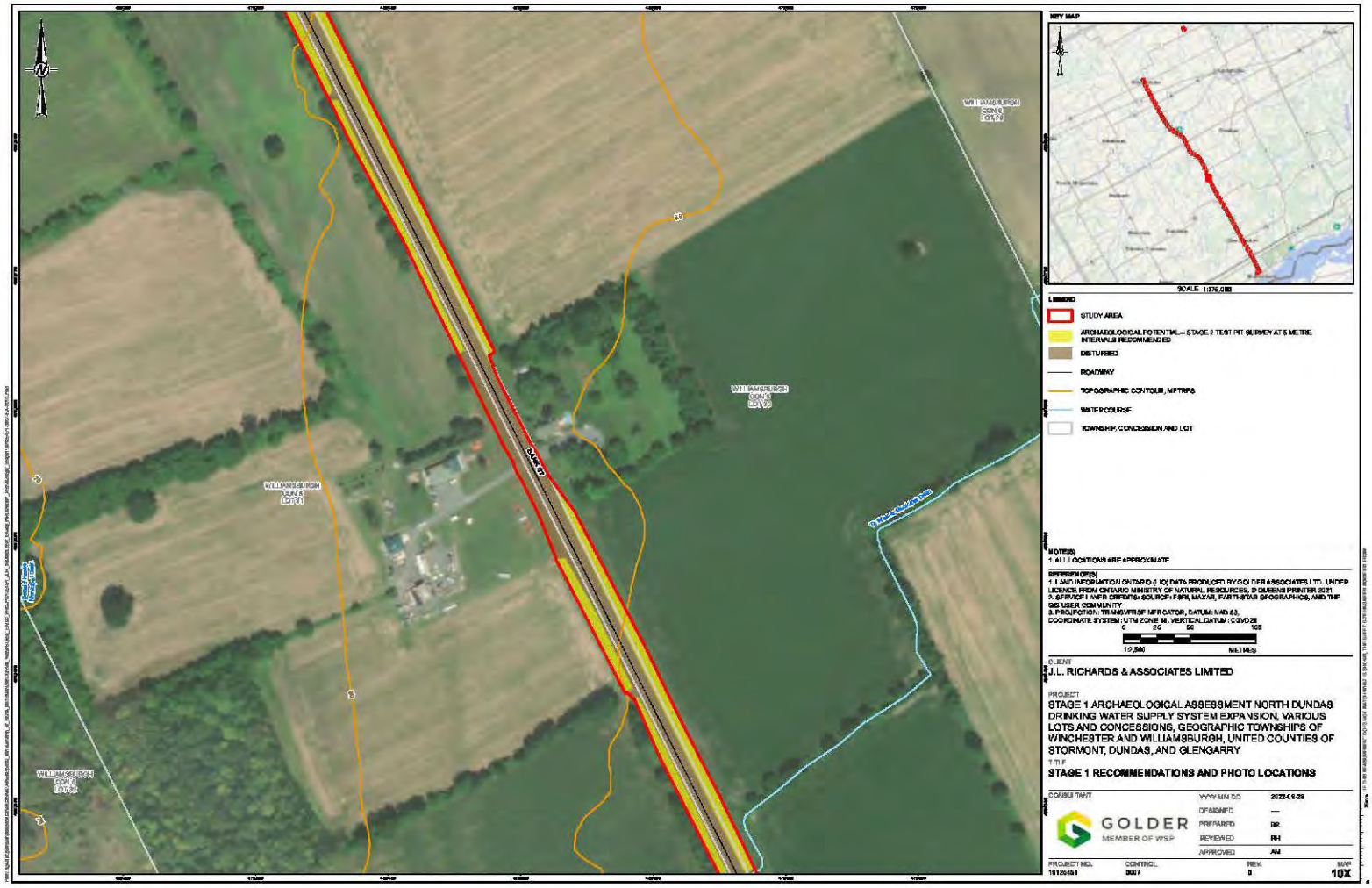
KEY MAP
SCALE 1:875,000
LEGEND
STUDY AREA
ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
DISTURBED
ROADWAY
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
REFERENCE(S)
1. GIS INFORMATION ONTARIO © [Q] DATA PRODUCED BY GOLDER ASSOCIATES LTD., UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28
0 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY/MM/DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
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MAP 10X

KEY MAP

SCALE 1:875,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION, AND LOT

NOTE(S)
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REFERENCE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
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STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
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REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10Y

KEY MAP

SCALE 1:375,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

ARCHAFOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED

DISTURBED

ROADWAY

UTILITY LINE

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

UNEVALUATED PROVINCIAL WETLAND

WATERBODY

TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARF APPROXIMATF

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0 25 50 100
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PROJECT NO.	CONTROL	REV.	MAP
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KEY MAP

SCALE 1:875,000

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- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- UTILITY LINE
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
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0 50 100 200
1:2,500
METRES

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J.L. RICHARDS & ASSOCIATES LIMITED

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APPROVED	AM

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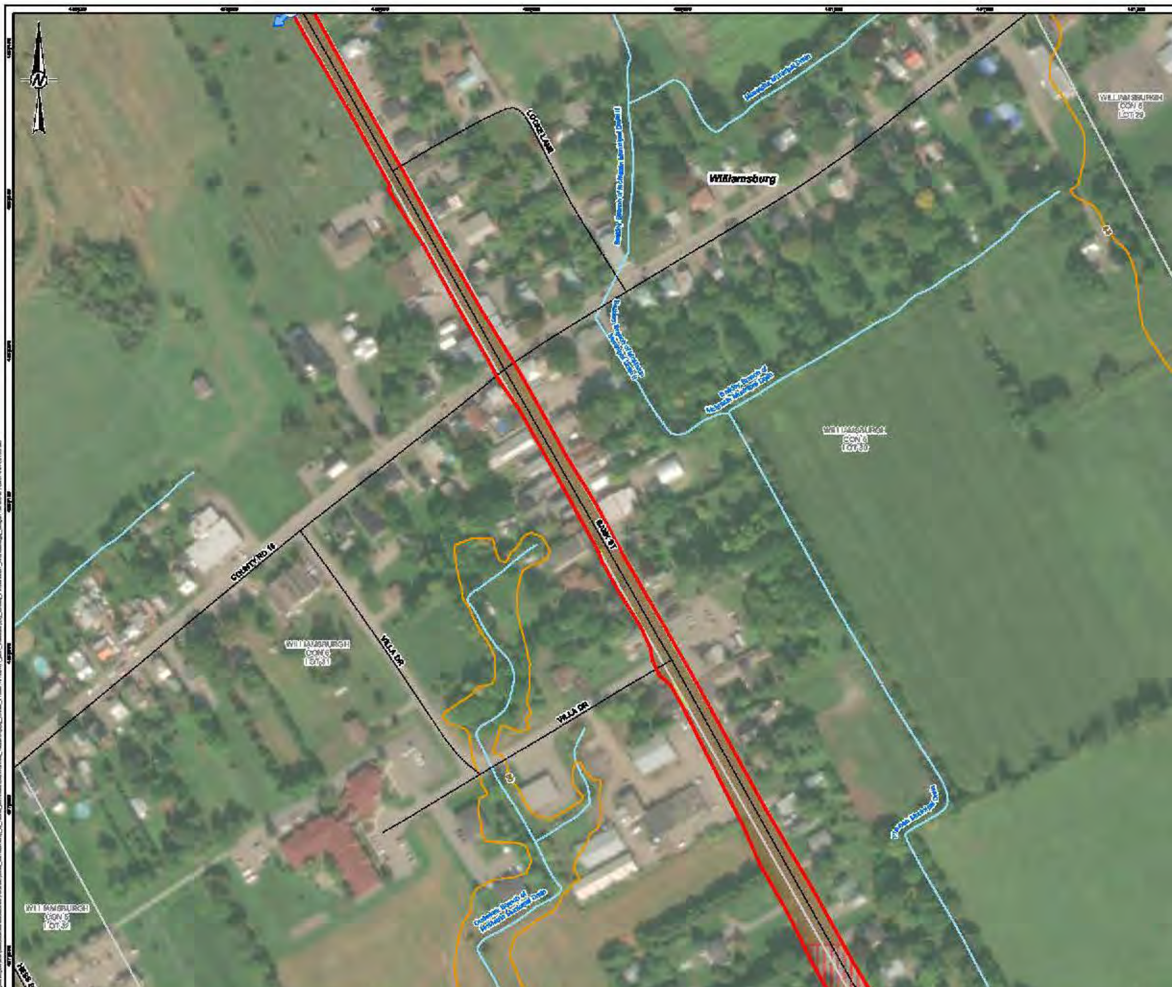

KEY MAP

SCALE 1:375,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- SEE SUPPLEMENTARY DOCUMENTATION
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10BB

KEY MAP

SCALE 1:375,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- SEE SUPPLEMENTARY DOCUMENTATION
- PREVIOUSLY ASSESSED – NO FURTHER ARCHAEOLOGY RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- WATERBODY
- TOWNSHIP, CONCESSION AND LOT

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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
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STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10CC

KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- SEE SUPPLEMENTARY DOCUMENTATION
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

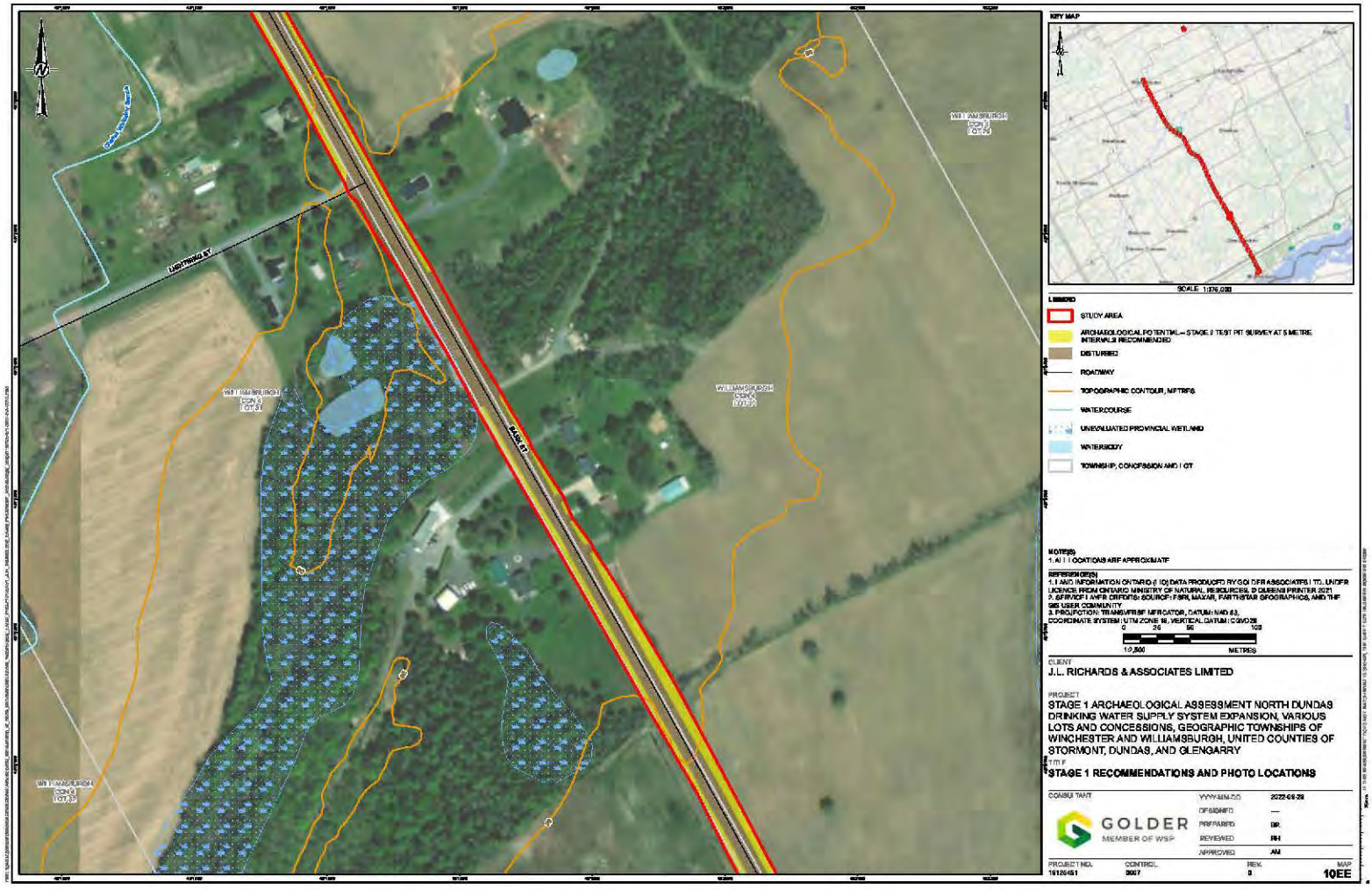
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-28
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10DD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SCALE 1:1676,000
LEGEND
STUDY AREA
ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
DISTURBED
ROADWAY
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
UNEVALUATED PROVINCIAL WETLAND
WATERBODY
TOWNSHIP, CONCESSION AND LOT
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0 25 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
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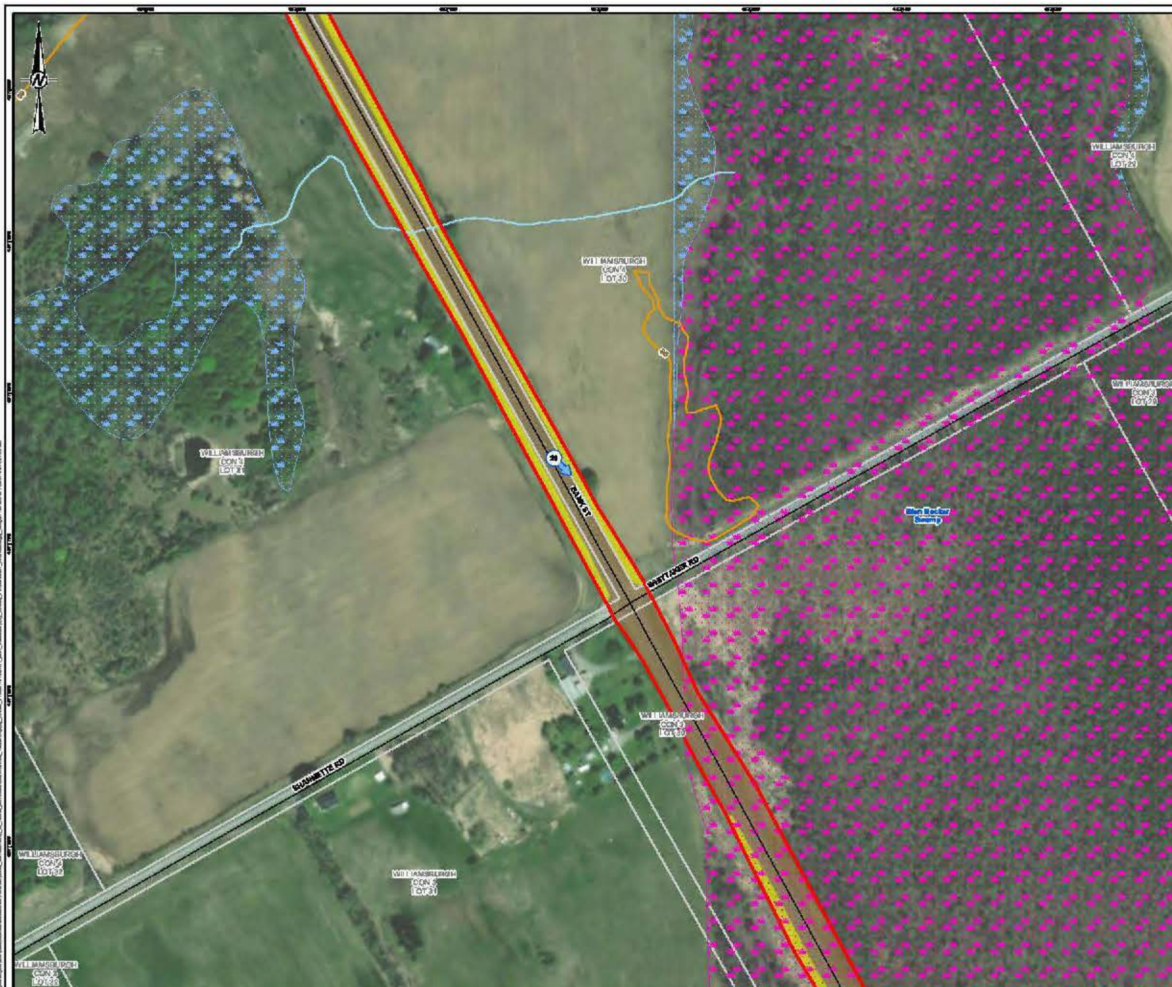
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 10EE
LIGHTNING ST
MAIN ST
WILLIAMSBURGH CON 3 LOT 24
WILLIAMSBURGH CON 4 LOT 24
WILLIAMSBURGH CON 4 LOT 25
WILLIAMSBURGH CON 5 LOT 24



KEY MAP

SCALE 1:375,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
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- TOPOGRAPHIC CONTOUR, METRES
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0 25 50 100
1:2,500 METRES

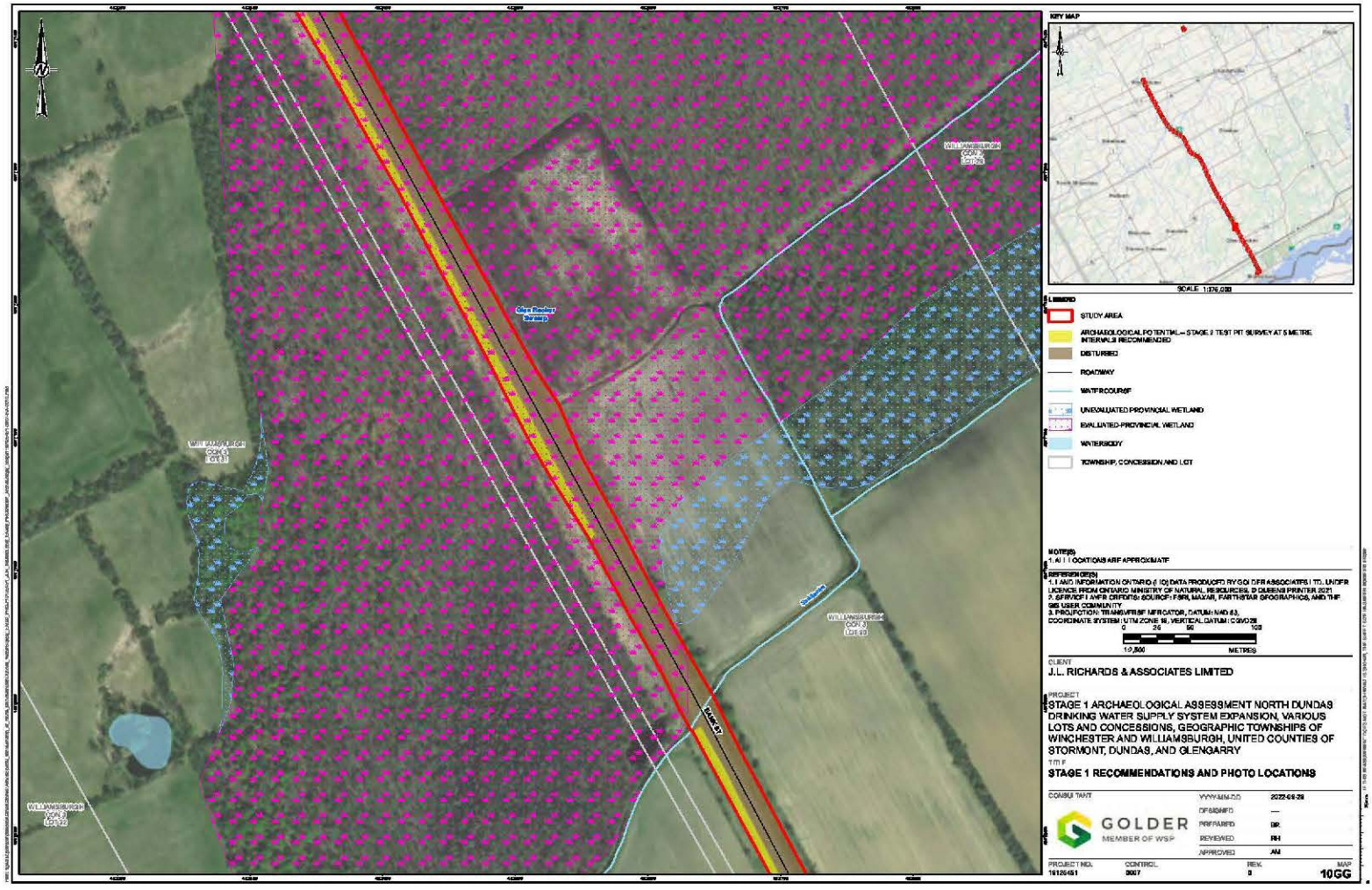
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT		
GOLDER MEMBER OF WSP	YYYY-MM-DD	2022-08-29
	DESIGNED	—
	PREPARED	BR
	REVIEWED	RH
	APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10FF


KEY MAP
SCALE 1:875,000
LEGEND
STUDY AREA
ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
DISTURBED
ROADWAY
WATERCOURSE
UNEVALUATED PROVINCIAL WETLAND
EVALUATED-PROVINCIAL WETLAND
WATERBODY
TOWNSHIP, CONCESSION AND LOT
NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
REFERENCE(S)
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2. ESRI ROPI LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28
0 25 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY/MM/DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 10GG

KEY MAP

SCALE 1:875,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- EVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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2. ESRI ROPI AND ITS DEPUTIES: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

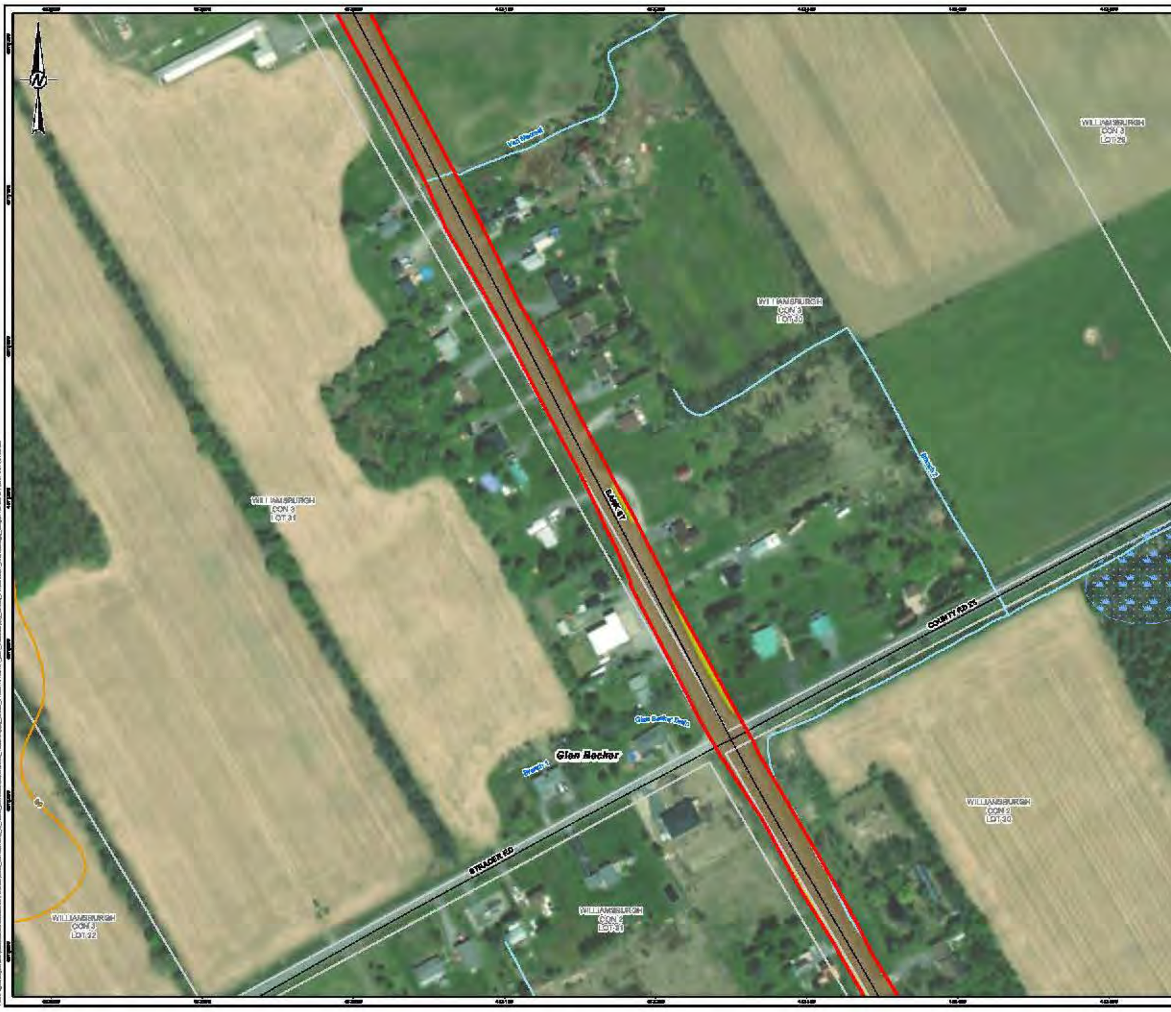
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	10HH



KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
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NOTE(S)
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BP
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19126451	0007	0	10II

KEY MAP

SCALE 1:175,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- PREVIOUSLY ASSESSED – NO FURTHER ARCHAEOLOGY RECOMMENDED
- DISTURBED
- ROADWAY
- UTILITY LINE
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
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NOTE(S)
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0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

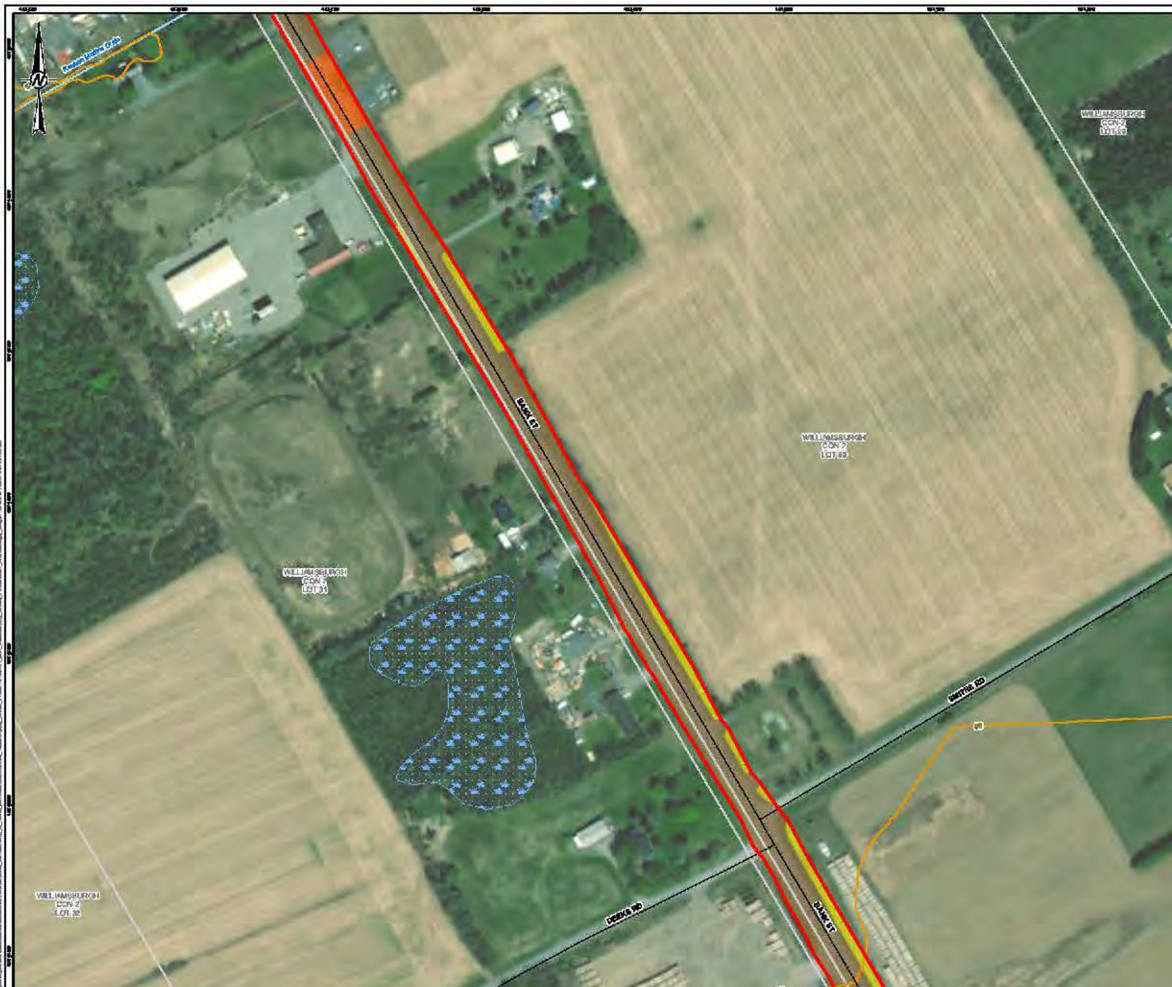
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10JJ



KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- PREVIOUSLY ASSESSED – NO FURTHER ARCHAEOLOGY RECOMMENDED
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0 25 50 100
12,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

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STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

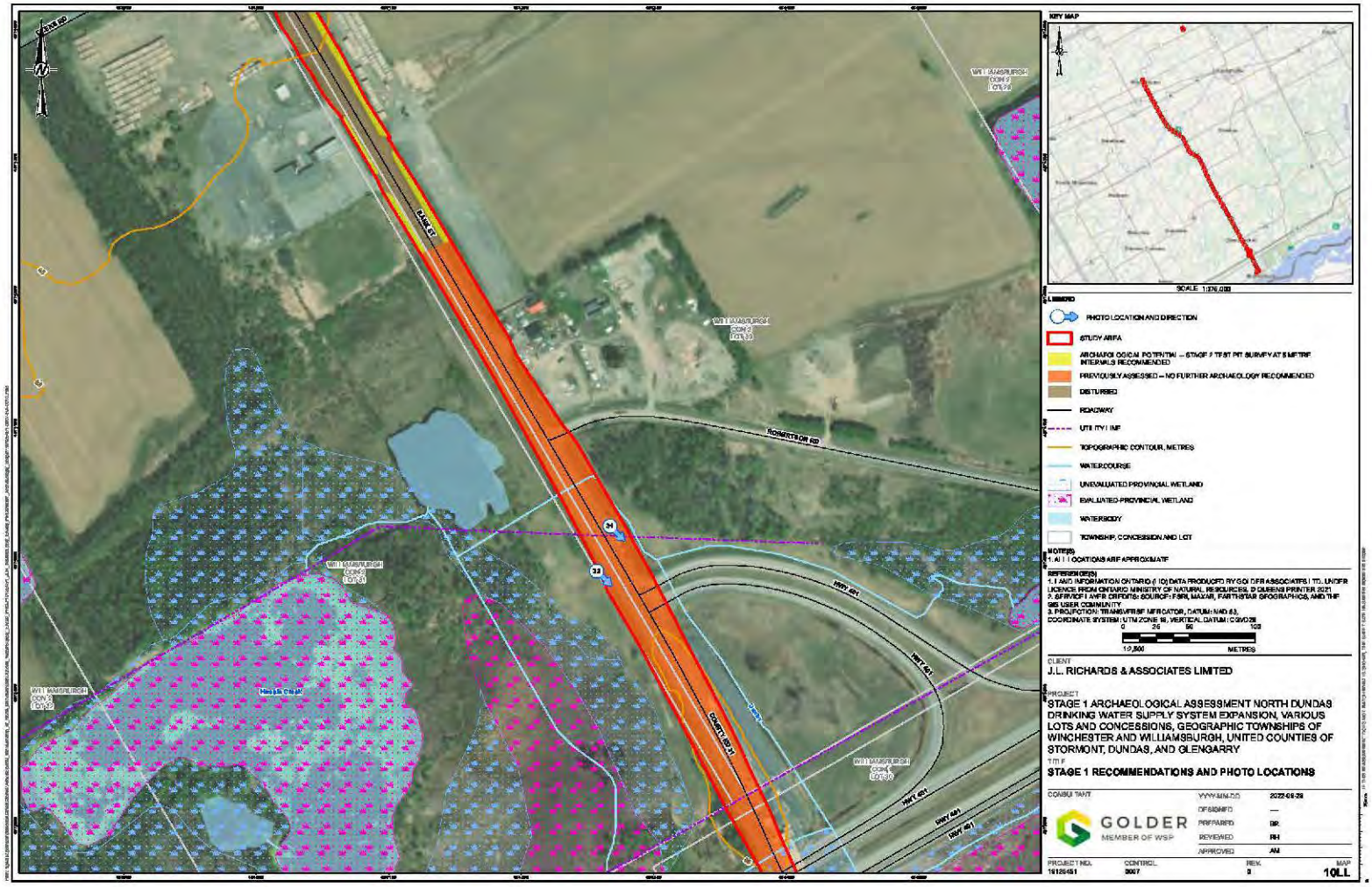
TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-08-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10KK


KEY MAP
SCALE 1:175,000
LEGEND
PHOTO LOCATION AND DIRECTION
STUDY AREA
ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
PREVIOUSLY ASSESSED – NO FURTHER ARCHAEOLOGY RECOMMENDED
DISTURBED
ROADWAY
UTILITY LINE
TOPOGRAPHIC CONTOUR, METRES
WATERCOURSE
UNEVALUATED PROVINCIAL WETLAND
EVALUATED PROVINCIAL WETLAND
WATERBODY
TOWNSHIP, CONCESSION AND LOT
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0 25 50 100
1:2,500
METRES
CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY
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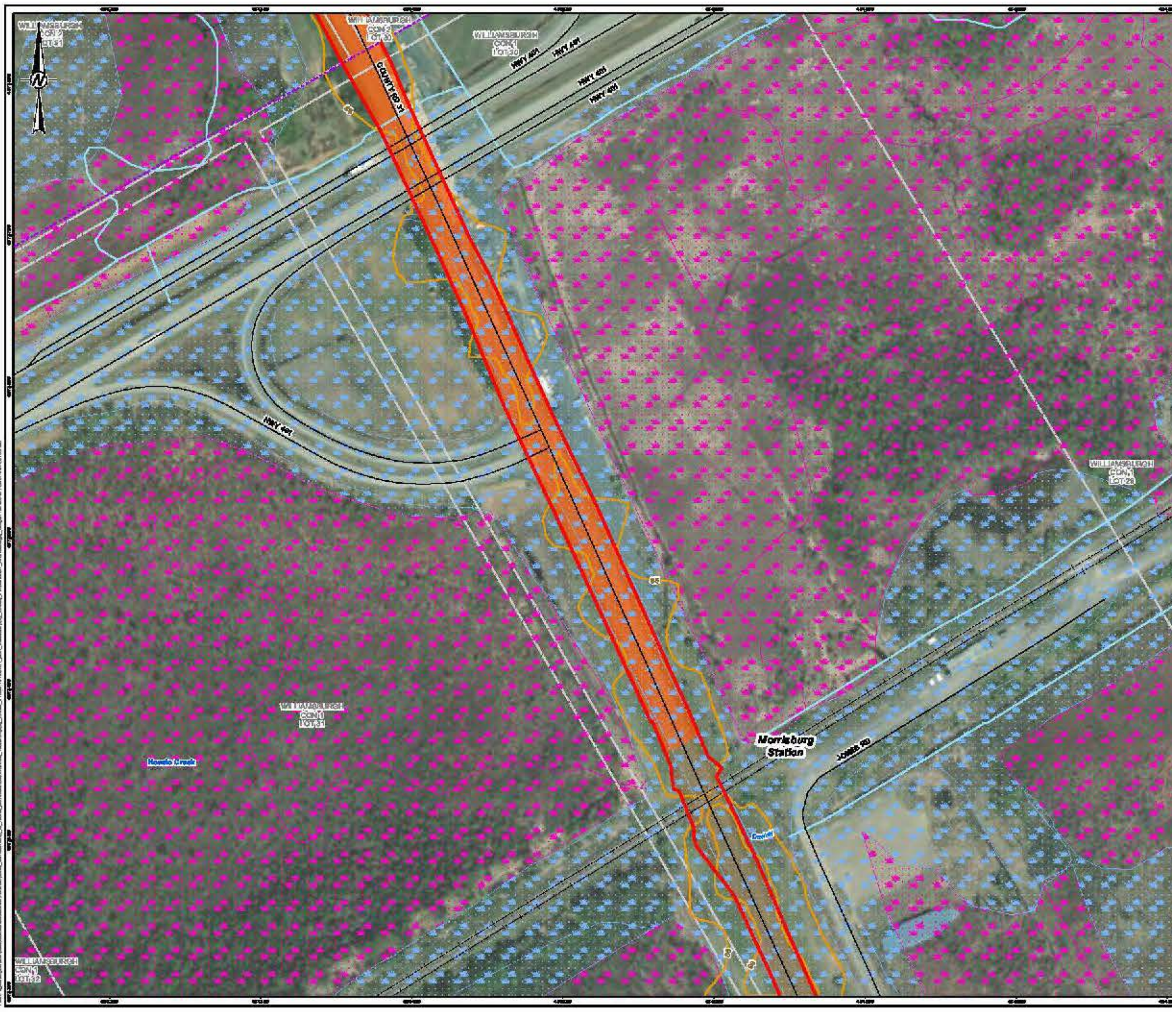
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS
CONSULTANT
GOLDER
MEMBER OF WSP
YYYY-MM-DD 2022-06-29
DESIGNED —
PREPARED BR
REVIEWED RH
APPROVED AM
PROJECT NO. 19125451
CONTROL 0007
REV. 0
MAP 10LL
EARNEST ST
ROBERTSON RD
COUNTY RD 21
HWY 401
HWY 401
HWY 401
HWY 401
WILLIAMSBURGH CON 2 LOT 30
WILLIAMSBURGH CON 3 LOT 30
WILLIAMSBURGH CON 4 LOT 30
WILLIAMSBURGH CON 5 LOT 30
WILLIAMSBURGH CON 6 LOT 30
Hoople Creek



KEY MAP

SCALE 1:375,000

LEGEND

- STUDY AREA
- PREVIOUSLY ASSESSED – NO FURTHER ARCHAEOLOGY RECOMMENDED
- DISTURBED
- ROADWAY
- UTILITY LINE
- RAILROAD
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
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0 25 50 100
1:2,500 METRES

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J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

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STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
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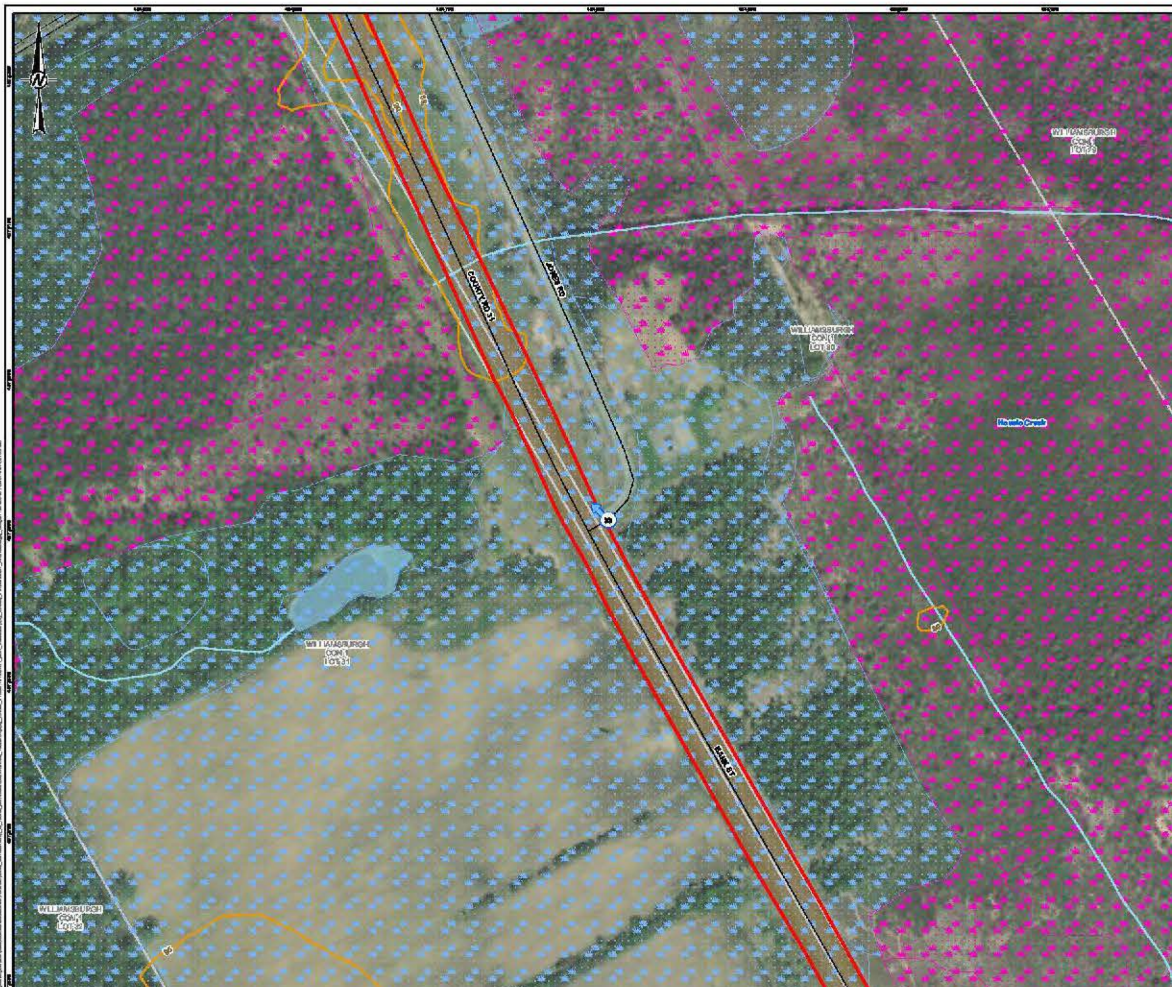
PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10MM



KEY MAP

SCALE 1:376,000

LEGEND

PHOTO LOCATION AND DIRECTION

STUDY AREA

DISTURBED

ROADWAY

RAILROAD

TOPOGRAPHIC CONTOUR, METRES

WATERCOURSE

UNEVALUATED PROVINCIAL WETLAND

EVALUATED-PROVINCIAL WETLAND

WATERBODY

TOWNSHIP, CONCESSION AND LOT

NOTE(S)
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0 25 50 100
1:2,500 METRES

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J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

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CONSULTANT		
GOLDER MEMBER OF WSP	YYYY-MM-DD	2022-09-28
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	REVIEWED	RH
	APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	8007	0	10NN

KEY MAP

SCALE 1:175,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
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- EVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD., UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2021.
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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100
1:2,500 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

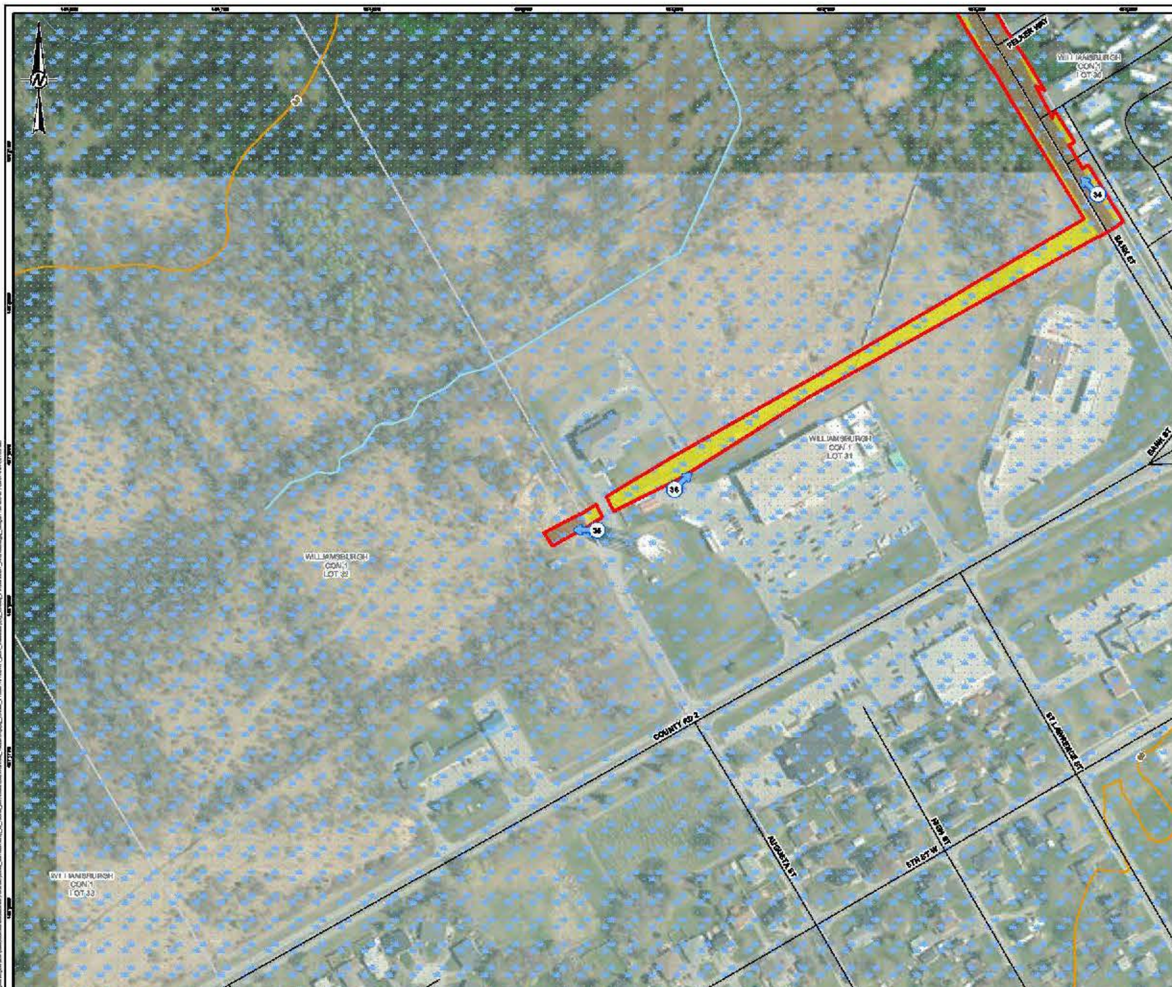
PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM EXPANSION, VARIOUS LOTS AND CONCESSIONS, GEOGRAPHIC TOWNSHIPS OF WINCHESTER AND WILLIAMSBURGH, UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY

TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	1000



KEY MAP

SCALE 1:375,000

LEGEND

- PHOTO LOCATION AND DIRECTION
- STUDY AREA
- ARCHAEOLOGICAL POTENTIAL – STAGE 2 TEST PIT SURVEY AT 5 METRE INTERVALS RECOMMENDED
- DISTURBED
- ROADWAY
- TOPOGRAPHIC CONTOUR, METRES
- WATERCOURSE
- UNEVALUATED PROVINCIAL WETLAND
- TOWNSHIP, CONCESSION AND LOT

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
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0 25 50 100
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TITLE
STAGE 1 RECOMMENDATIONS AND PHOTO LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-09-29
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	AM

PROJECT NO.	CONTROL	REV.	MAP
19125451	0007	0	10PP

Signature Page

We trust that this report meets your current needs. If you have any questions, or if we may be of further assistance, please contact the undersigned.

Golder Associates Ltd.

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Staff Archaeologist

Aaron Mior, M.MA.
Senior Archaeologist

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