APPENDIX H STAGE 1 ARCHAEOLOGICAL ASSESSMENT - DELAWARE SANITARY PUMPING STATION #2

Stage 1 Archaeological Assessment: Delaware Sanitary Pumping Station #2

Part of Lot 4, Concession D, Geographic Township of Delaware, now Municipality of Middlesex Centre, Middlesex County, Ontario

December 23, 2024

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Project Number: 165630236

ORIGINAL REPORT

Limitations and Sign-off

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Executive Summary

The Municipality of Middlesex Centre (the Municipality) retained Stantec Consulting Ltd. (Stantec) to complete the Middlesex Centre Servicing Master Plan (SMP). From the SMP, the Municipality identified the need to construct a new sanitary pumping station, the Delaware Sanitary Pumping Station #2 (the Project). The Project is being completed as part of a Schedule 'B' Municipal Class Environmental Assessment (Class EA) and the Stage 1 archaeological assessment was undertaken by Stantec, on behalf of the Municipality, in the preliminary planning and design process of the Class EA under the *Ontario Environmental Assessment Act* (Government of Ontario 1990a). The study area for the Project is located in part of Lot 4, Concession D, Geographic Township of Delaware, now Municipality of Middlesex Centre, Middlesex County, Ontario. The study area comprises municipal parkland, encompassing an area of approximately 0.1 hectares.

The Stage 1 archaeological assessment was completed under Project Information Form number P256-0801-2024, issued to Parker Dickson, MA by the Ministry of Citizenship and Multiculturalism (the MCM). A property inspection was conducted on May 16, 2024, by Parker Dickson (P256).

The Stage 1 archaeological assessment of the study area for the Project determined that the entire study area (100.0%) retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impact an area of archaeological potential.**

Full and detailed recommendations are provided in the body of the report.

The MCM is asked to review the results presented and to enter this report into the *Ontario Public Register of Archaeological Reports.*

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

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Acronyms / Abbreviations

The Municipality	Municipality of Middlesex Centre
Stantec	Stantec Consulting Ltd.
Servicing Master Plan	SMP
Class EA	Class Environmental Assessment
ROW	Right-of-way
MCM	Ministry of Citizenship and Multiculturalism
BP	Before Present
GIS	Geographical Information Services
GNSS	Global Navigation Satellite System

1 Project Context

1.1 Development Context

The Municipality of Middlesex Centre (the Municipality) retained Stantec Consulting Ltd. (Stantec) to complete the Middlesex Centre Servicing Master Plan (SMP). The purpose of the SMP was to update the strategy previously developed in 2010 (Middlesex Centre 2024). Since the completion of the 2010 SMP, the Municipality has experienced growth in settlement areas which has prompted servicing extensions and infrastructure upgrades not captured in the previous study. As such, the SMP examines the servicing system by reviewing new planning policies; considering population and development growth projections; reviewing current and future needs that exist in the Municipality; aligning with and supporting the Municipality's Official Plan and other strategic plans and policies; and, supporting planned growth within the Municipality to the year 2042 (Middlesex Centre 2024). The SMP will identify shortcomings in the water, wastewater, stormwater, and solid waste servicing systems, and identify a preferred solution(s) to support planned growth in the Municipality to the year 2042. From the SMP, the Municipality identified the need to construct a new sanitary pumping station, the Delaware Sanitary Pumping Station #2 (the Project).

The Project is being completed as part of a Schedule 'B' Municipal Class Environmental Assessment (Class EA) and the Stage 1 archaeological assessment was undertaken by Stantec, on behalf of the Municipality, in the preliminary planning and design process of the Class EA under the *Ontario Environmental Assessment Act* (Government of Ontario 1990a). The study area for the Project is located in part of Lot 4, Concession D, Geographic Township of Delaware, now Municipality of Middlesex Centre, Middlesex County, Ontario and comprises municipal parkland, encompassing an area of approximately 0.1 hectares (Figure 1 and Figure 2).

1.1.1 Objectives

In compliance with the provincial standards and guidelines set out in the Ministry of Citizenship and Multiculturalism's (MCM's) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 1 archaeological assessment are to:

- Provide information about the study area's geography, history, previous archaeological fieldwork, and current land conditions.
- Evaluate the study area's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property.
- Recommend appropriate strategies for Stage 2 survey.

To meet these objectives, Stantec archaeologists:

- Reviewed relevant archaeological, historical, and environmental literature pertaining to the study area.
- Reviewed the land use history of the study area, including pertinent historical maps.

- Examined the *Ontario Archaeological Sites Database* to determine the presence of registered archaeological sites in and around the study area.
- Queried the *Ontario Public Register of Archaeological Reports* to identify previous archaeological assessments which have occurred within 50 metres of the study area.
- Completed a property inspection of the study area.

Permission to enter the study area for the property inspection was provided by the Municipality.

1.2 Historical Context

"Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the interaction between Indigenous and European nations. There is no definitive moment of contact and the understanding of when Indigenous and European nations first began to influence one another is evolving with new study of archaeological and historical evidence, and from Indigenous oral tradition and history. Contact in what is now the Province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

1.2.1 Pre-Contact Indigenous Resources

It has been demonstrated that Indigenous people began occupying southern Ontario as early as 11,000 years ago as the Laurentide glacier receded (Ellis and Ferris 1990, 13). Much of what is understood about the lifeways of these Indigenous peoples is derived from archaeological evidence and ethnographic analogy. In Ontario, Indigenous culture prior to contact with European peoples has been distinguished into archaeological periods based on observed changes in material culture. These archaeological periods are largely based on observed changes to formal lithic tools. They are separated into the Early Paleo, Late Paleo, Early Archaic, Middle Archaic, Late Archaic, and Terminal Archaic periods. Following the advent of ceramic technology in the Indigenous archaeological record, archaeological periods are separated into the Early Woodland, Middle Woodland, and Late Woodland periods, based primarily on observed changes in formal ceramic decoration.

It should be noted that these archaeological periods do not necessarily represent specific cultural identities but are a useful paradigm for understanding changes in Indigenous culture through time. The current understanding of Indigenous archaeological culture is summarized in Table 1, based on Ellis and Ferris (1990). The provided periods are based on the "Before Present" (BP) calendar notation system, wherein BP stands for the years before the present. The "Present Year" is set in the calendar year 1950.

Table 1: Generalized Cultural Chronology of the Study Area

Archaeological Period	Characteristics	Time Period	Comments
Early Paleo	Fluted Projectiles	10,950 – 10,350 BP	Spruce parkland/caribou hunters
Late Paleo	Hi-Lo Projectiles	10,350 – 9,950 BP	Smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	9,950 – 7,950 BP	Slow population growth
Middle Archaic	Brewerton-like points	7,950 – 4,450 BP	Environment similar to present

Archaeological Period	Characteristics	Time Period	Comments
Late Archaic	Narrow Points	4,450 – 3,750 BP	Increasing site size
	Broad Points	3,750 – 3,450 BP	Large chipped lithic tools
	Small Points	3,450 – 3,050 BP	Introduction of bow hunting
Terminal Archaic	Hind Points	3,050 – 2,900 BP	Emergence of true cemeteries
Early Woodland	Meadowood Points	2,900 – 2,350 BP	Introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	2,350 – 1,400 BP	Increased sedentism
	Princess Point Pottery	1,400 – 1,050 BP	Introduction of corn
Late Woodland	Early Late Woodland Pottery	1050 – 650 BP	Emergence of agricultural villages
	Middle Late Woodland Pottery	650 – 550 BP	Long longhouses (100+ metres)
	Late Late Woodland Pottery	550 – 350 BP	Tribal warfare and displacement

Between 10,950 and 9,950 BP, Indigenous populations were sustained by hunting, fishing, and foraging and lived a relatively nomadic existence across an extensive geographic territory. Despite these wide territories, social ties were maintained between groups. One method of maintaining social ties was through gift exchange, which was evident through exotic lithic material documented on many sites (Ellis 2013, 35-40).

By approximately 9,950 BP, evidence existed and became more common for producing ground-stone tools such as axes, chisels, and adzes. These tools themselves are believed to be indicative specifically of woodworking. This evidence can be extended to indicate an increased craft production and, arguably, craft specialization. This latter statement is supported by evidence dating to approximately 8,950 BP of ornately carved stone objects, which would be laborious to produce and have explicit aesthetic qualities (Ellis 2013, 41). This indirectly indicates changes in the social organization, which permitted individuals to devote time and effort to craft specialization. Since 9,950 BP, the Great Lakes basin experienced a low-water phase, with shorelines significantly below current lake levels (Stewart 2013, Figure 1.1.C). It is presumed that the majority of human settlements would have been focused along these former shorelines. At approximately 8,450 BP, the climate had warmed considerably since the recession of the glaciers, and the environment had grown more similar to the present day. By approximately 6,450 BP, evidence exists from southern Ontario for using native copper, i.e., naturally occurring pure copper metal (Ellis 2013, 42). The recorded origin of this material along Lake Superior's north shore indicates extensive exchange networks across the Great Lakes basin.

At approximately 5,450 BP, the isostatic rebound of the North American plate following the melt of the Laurentide glacier had reached a point that significantly affected the Great Lakes basin watershed. Prior to this, the Upper Great Lakes had drained down the Ottawa Valley via the French River and Mattawa River valleys. Following this shift in the watershed, the drainage of the Great Lakes basin changed to its present course. This also prompted a significant increase in water-level to approximately current levels (with a brief high-water period); this change in water levels is believed to have occurred catastrophically (Stewart 2013, 28-30). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013, 46). By 4,450 BP, the earliest evidence exists for constructing fishing weirs (Ellis et al. 1990, Figure 4.1). However, the construction of fishing weirs could have occurred as early as 8,600 BP (Stevens

2004). Regardless, the construction of fishing weirs would have required a large amount of communal labour and indicates the continued development of social organization and communal identity. The large-scale food procurement at a single location also has significant implications for the permanence of settlement within the landscape. This period is also marked by further population increase; by 3,450 BP, evidence exists for substantial permanent structures (Ellis 2013, 45-46).

By approximately 2,900 BP, the earliest evidence exists for populations using ceramics. Populations are understood to have continued to exploit natural resources seasonally. However, this advent of ceramic technology correlated with the intensive exploitation of seed foods such as goosefoot and knotweed and mast such as nuts (Williamson 2013, 48). The use of ceramics implies changes in the social organization of food storage, cooking, and diet. Fish also continued to be an important facet of the economy at this time. Evidence continues for the expansion of social organization (including hierarchy), group identity, ceremonialism (particularly in burial), interregional exchange throughout the Great Lakes basin and beyond, and craft production (Williamson 2013, 48-54).

By approximately 1,400 BP, evidence emerged for introducing maize into southern Ontario. This crop would have initially only supplemented Indigenous people's diet and economy (Birch and Williamson 2013, 13-14). Maize-based agriculture gradually became more important to societies. By approximately 900 CE, permanent communities emerged primarily focused on agriculture and the storage of crops, with satellite locations oriented toward procuring other resources such as hunting, fishing, and foraging. By approximately 700 BP, evidence exists for the common cultivation of historic Indigenous cultigens, including maize, beans, squash, sunflower, and tobacco. The extant archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013, 55).

1.2.2 Post-Contact Indigenous Resources

The post-contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian-speaking groups from northern Ontario at the end of the 17th century and beginning of the 18th century (Konrad 1981, Schmalz 1991). By 1690, Algonkian speakers from the north appear to have begun repopulating Bruce County (Rogers 1978, 761). This is when the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa, and Potawatomi) immigrated from Ohio and Michigan in the late 1700s (Feest and Feest 1978, 778-779). At approximately 1790, the study area was occupied by populations of Ottawa, Chippewa, Pottawatomi, and Wyandot (Feest and Feest 1978, 777, 779).

From the mid-16th century until the turn of the 17th century, the region of the study area was within the extended political territory of Iroquoian populations who were probably ancestral to those historically described as the *Neutre* (by the French), *Neutral* (by the English), or the *Atawandaron* (by the Huron-Wendat); their autonym is not conclusively known (Birch 2015). Following the turn of the 17th century, the region of the study area seems to have been abandoned by permanent settlement and constituted a liminal territory between the Atawandaron and the Fire Nation, an Algonquian group occupying the western end of Lake Erie. It is argued, however, that the Atawandaron expanded extensively westward,

displacing the Fire Nation and occupying the region of modern Chatham-Kent (Lennox and Fitzgerald 1990, 418-419).

It is debated whether the Fire Nation were descendent from the archaeologically described Western Basin Tradition (which is documented throughout the Thames River Valley watershed since approximately 1250 BP) or if they migrated into the western part of Lake Erie, displacing a previous Indigenous culture (Murphy and Ferris 1990, 193-194). In 1649, the Seneca and the Mohawk led a campaign into southern Ontario and dispersed the Huron-Wendat, Tionontati (Petun), and Atawandaron, and the Seneca established dominance over the region and used it for a hinterland for beaver hunting (Heidenreich 1978). By 1690, Ojibwa-speaking people had begun moving south into the lower Great Lakes basin. From the turn of the 18th century, the Indigenous economy focused on fishing and the fur trade, supplemented by agriculture and hunting (Konrad 1981; Rogers 1978). Generally, the study area falls within the traditional territory of the Bkejwanong (Walpole Island) First Nation, the Aamjiwnaang (Sarnia) First Nation (Aamjiwnaang First Nation), the Wiiwkwedong and Aazhoodena (Kettle Point and Stony Point) First Nation, and the Deshkaan Ziibing Anishinaabeg (Chippewas of the Thames First Nation.

The expansion of the fur trade led to increased interaction between European and Indigenous people and, ultimately, intermarriage between European men and Indigenous women. During the 18th century, the progeny of these marriages began to identify no longer with either their paternal or maternal cultures but as Métis. The ethnogenesis of the Métis progressed with the establishment of distinct Métis communities along the major waterways in the Great Lakes of Ontario. Métis communities were primarily focused around the upper Great Lakes and along Georgian Bay; however, Métis people have historically lived throughout Ontario (Métis Nation of Ontario 2024; Stone and Chaput 1978, 607-608).

Despite the differentiation among Indigenous groups in Euro-Canadian sources, there was a considerably different view by Indigenous communities concerning their self-identification during the first few centuries of European contact. These peoples relied upon kinship ties that cut across European notions of nation identity (Bohaker 2006, 277-283). Many of the British-imposed nation names, such as Chippewa, Ottawa, Potawatomi, or Mississauga, artificially separated how self-identified Anishinaabeg classified themselves (Bohaker 2006, 1-8) and as a result, a number of these groups were culturally and socially more alike than contemporary European documentation might indicate.

Since contact with European explorers and immigrants and, later, with the establishment of provincial and federal governments (the Crown), the lands within Ontario have been included in various treaties, land claims, and land cessions. Though not an exhaustive list, Morris (1943) outlines some treaties within the Province of Ontario from 1783 to 1923. Based on Morris (1943), the study area is situated within Treaty Number 2. Treaty Number 2 was established on May 19, 1790, between the Crown and the Odawa, Chippewa, Pottawatomi, and Huron. Treaty Number 2:

> ... was made with the O[dawa], Chippew[a], Pottawatom[i] and Huro[n] May 19th, 1790, portions of which nations had established themselves on the Detroit River all of whom had been driven by the Iroquois from the northern and eastern parts of the Province, from the Detroit River easterly to Catfish Creek and south of the river La Tranche [Thames River] and Chenail Ecarte, and contains Essex County except Anderdon Township and Part of West

> Sandwich; Kent County except Zone Township, and Gores of Camden and Chatham; Elgin County except Bayham Township and parts of South Dorchester and Malahide. In Middlesex County, Del[a]ware and Westminster Townships and part of North Dorchester [are included].
>
> (Morris 1943, 21)

While it is difficult to exactly delineate treaty boundaries today, Figure 3 provides an approximate outline of Treaty Number 2 (identified by the letter "C").

Caldwell First Nation was not part of the negotiations or signing of Treaty Number 2 (Mckee's Purchase) and could not secure rights and benefits from the treaty (Caldwell First Nation 2021). Without a treaty, Caldwell First Nation's traditional territory remained in possession of private and government interests. In November 2020, Caldwell First Nation received land designation from the Crown and established a Reserve for their community (Caldwell First Nation 2021). Today, several Indigenous communities express interest in land use planning and development within the general region of the study area, including Caldwell First Nation, Chippewas of the Thames First Nation, Oneida Nation of the Thames, Delaware-Munsee Nation, Walpole Island First Nation, Aamjiwnaang First Nation and Chippewas of Kettle Point and Stony Point First Nation.

The nature of Indigenous settlement size, population distribution, and material culture shifted as European settlers encroached upon their territory. However, despite this shift, "written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to…systems of ideology and thought" (Ferris 2009, 114). As a result, Indigenous peoples have left behind archaeological resources throughout southern Ontario, which show continuity with past peoples, even if they have not been recorded in Euro-Canadian documentation.

1.2.3 Euro-Canadian Resources

In 1791, the Provinces of Upper Canada and Lower Canada were created from the former Province of Quebec by an act of British Parliament. At this time, Colonel John Graves Simcoe was appointed as the Lieutenant Governor of Upper Canada and was tasked with governing the new province, directing its settlement, and establishing a constitutional government modelled after that of Britain. In 1792, Simcoe divided Upper Canada into 19 counties consisting of previously settled lands, new lands opened for settlement, and lands not yet acquired by the Crown. These new counties stretched from Essex in the west to Glengarry in the east.

1.2.3.1 Middlesex County

The County of Middlesex, located in the London District, comprised ten townships: Aldborough, Dunwich, Southwold, Yarmouth, Malahide, Bayham, Delaware, Westminster, Dorchester, and London. By 1842, the population of Middlesex County had reached over 31,000 European inhabitants. The area developed quickly, and over the next two years, roughly 7,300 hectares of land became cleared for agricultural purposes. By 1844, the county's agricultural lands exceeded 52,000 hectares (Smith 1846). Middlesex County was known for its many good roads at this time. Between 1846 and 1849, Middlesex County

comprised the townships of Adelaide, Aldborough, Bayham, Caradoc, Delaware, Dorchester, Dunwich, Ekfrid, Lobo, London, Metcalfe, Mosa, Malahide, Southwold, Westminster, Williams, Yarmouth, and the Town of London. The townships of Yarmouth, London, Lobo, Westminster, Southwold, and Malahide were the best settled and, overall, the county contained many good farms with large clearings and expansive orchards (Smith 1846).

1.2.3.1.1 Geographic Township of Delaware

The Township of Delaware was surveyed between 1792 and 1794 by Deputy Provincial Surveyor William Hambly, which resulted in the creation of 125 lots, each approximately 200 acres in size (Grainger 2006). Land in the southwest portion of the township was reserved for the Oneida First Nation, now Oneida Nation of the Thames, who were allies of the Crown during the American Revolutionary War (Grainger 2006). The first European settlers in Delaware Township were Ebenezer Allan and Mathias Crow, who settled along the Thames River in 1798. Neither would remain in the township long; both defected to the United States during the War of 1812. Other early European settlers and patent holders included Gideon Tiffany, Squire Singer, Thomas Sumner, Thomas Allison, Ronald McDonald, and Joseph Kilbourne (Page & Co. 1878). The War of 1812 proved disruptive to the township as prominent citizens of the township and other early European settlers defected to the United States or fled the township out of fear (Grainger 2006).

In 1817, the Township of Delaware was home to 80 European immigrants and contained 18 dwellings, 2 sawmills, 1 church, 1 school, and 1 gristmill (Grainger 2006). The hamlet of Delaware was initially very prosperous and was even considered as the District Seat for the London District. However, once London was chosen as the District Seat, the importance of Delaware diminished (Page & Co. 1878; Grainger 2006). By 1877, the population of the township was approximately 2,000 (Page & Co. 1878).

1.2.3.1.2 Historical Map Review

The 1862 *Historical County Map of Middlesex County* (Tremaine 1862) indicates that the Township of Delaware was well populated by the mid-19th century, with multiple railroads and small towns, including the village of Delaware, within the vicinity of the current study area (Figure 4). The 1878 *Illustrated Historical Atlas of the County of Middlesex, Ontario* (Page & Co. 1878) also demonstrates that, by the late 19th century, much of the current road system was constructed and is still recognizable today (Figure 5). The study area is situated within the village of Delaware, on the east side of the Thames River. No specific landowners or structures are illustrated for the study area on the 1862 nor the 1878 map.

In discussing the late 19th century historical mapping, it must be remembered that many historical county atlases were produced primarily to identify subscribers' factories, offices, residences, and landholdings and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997, 100). As such, structures were not accurately depicted or placed (Gentilcore and Head 1984). A review of historical mapping also has inherent accuracy difficulties due to potential errors in geo-referencing. Geo-referencing is conducted by assigning spatial coordinates to fixed locations and using these points to reference the remainder of the map spatially. Due to changes in ‘fixed’ locations over time (e.g., road intersections, road alignments, shorelines, etc.), errors/difficulties of scale and the

relative idealism of historical cartography, historical maps may not translate accurately into real space points. This may provide obvious inconsistencies during historical map review.

1.2.4 Heritage Properties

An inventory of heritage resources has been compiled and is maintained by the Municipality of Middlesex Centre (Middlesex Centre 2020). A review of the heritage inventories according to the Municipality of Middlesex Centre (Middlesex Centre 2020) and the Ontario Heritage Trust (Ontario Heritage Trust 2024) demonstrates no designated or listed properties within 300 metres of the study area.

1.3 Archaeological Context

1.3.1 The Natural Environment

The study area is situated within the Caradoc Sand Plains and London Annex physiographic region (Chapman and Putnam 1984, 146). This area is described as:

> Immediately surrounding the City and extending several miles eastward there is a basin lying between 850 and 900 feet a.s.l [above sea level]. Into this basin the earliest glacial spillways discharged muddy water, laying down beds of silt and fine sand. Later, when standing water had retired westward to lower levels, gravelly alluvium was spread over the lower parts of the basin.
>
> (Chapman and Putnam 1984, 146)

The soils within the study area were not mapped, due to significant areas of land which have been disturbed, modified, or permanently withdrawn from agricultural use (Hagerty and Kingston 1992). However, the study area is located in a valley complex, which follows along rivers and major tributaries with moderate to very steep slopes along valley sides and flood paints in valley bottoms (Hagerty and Kingston 1992). It is likely that original soils of the study area were suitable for early agricultural practices.

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southwestern Ontario have remained relatively stable over time, proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to current water is one of the most used variables for predictive modeling of archaeological site locations in Ontario. The Thames River is located approximately 70 metres southwest of the study area. The Thames River has experienced significant flooding events, the largest of which occurred in 1883. These events have altered the alignment of the river over time. The Thames River is designated as a Canadian Heritage River on the merit of its over 11,000 years of Indigenous occupation and its importance in Canada's post-contact history (Canadian Heritage Rivers System 2024). Use of the Thames River has evolved from being a transportation route used by early Indigenous inhabitants and Euro-Canadian explorers and settlers to an industrial power source to support the early mills of the City of London, and finally to a watercourse used for recreational purposes throughout the 20th and 21st centuries.

1.3.2 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by uppercase letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lowercase letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MCM who maintain the *Ontario Archaeological Sites Database*. The study area is located within Borden block AfHi.

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information and Protection of Privacy Act* (Government of Ontario 1990b). The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MCM will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the *Ontario Archaeological Sites Database* (Government of Ontario 2024a) has shown that 34 archaeological sites have been registered within a one-kilometre radius of the study area, including one site (AfHi-134) within 300 metres of the study area. No sites were identified within 50 metres of the study area.

Table 2: Registered Archaeological Sites within One Kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type
AfHi-7	Kivas	Indigenous	Scatter
AfHi-8	Kivi	Indigenous	Tool manufacturing
AfHi-9	Adams	Not identified in the *Ontario Archaeological Sites Database* (Government of Ontario 2024a)	Scatter
AfHi-10	Martin	Indigenous	Tool manufacturing
AfHi-11	Linna	Not identified in the *Ontario Archaeological Sites Database* (Government of Ontario 2024a)	Scatter
AfHi-12	Sauna	Indigenous	Tool manufacturing
AfHi-13	Sibelius	Indigenous (Archaic; Late Woodland)	Campsite
AfHi-14	Kalevala	Indigenous (Archaic)	Tool manufacturing
AfHi-15	Lonnrot	Indigenous	Scatter
AfHi-17	Thames	Indigenous	Scatter
AfHi-121	Boresma	Indigenous (Middle Woodland)	Campsite
AfHi-134	Pocock	Indigenous (Woodland)	Campsite

Borden #	Site Name	Cultural Affiliation	Site Type
AfHi-137	Belvoir	Indigenous (Woodland)	Campsite
AfHi-139	Paddock	Indigenous (Early Woodland); Euro-Canadian	Campsite
AfHi-140	Vanderveldon #1	Indigenous (Early Woodland)	Scatter
AfHi-150	Gehman	Indigenous	Campsite
AfHi-151	Lone Goose 2	Indigenous	Campsite
AfHi-152	Lone Goose	Indigenous (Late Archaic)	Campsite
AfHi-154	Big Ben	Indigenous (Early Woodland)	Findspot
AfHi-155	Horse Trials	Indigenous (Early Woodland)	Campsite
AfHi-156	Zucarlos	Indigenous	Scatter
AfHi-157	Ian Miller	Indigenous	Scatter
AfHi-158	Stallion	Indigenous	Scatter
AfHi-165	Longwoods Trail	Indigenous (Late Woodland)	Scatter
AfHi-166	Delaware Bottoms	Indigenous	Scatter
AfHi-218	Poetry	Indigenous	Scatter
AfHi-219	Vanderveldon 2	Indigenous	Scatter
AfHi-220	History	Euro-Canadian	Homestead
AfHi-221	Old Dingman Bridge	Indigenous	Scatter
AfHi-253	Not applicable (-)	Indigenous	Scatter
AfHi-334	-	Euro-Canadian	Midden
AfHi-386	-	Euro-Canadian	Farmstead
AfHi-387	-	Indigenous (Woodland)	Findspot
AfHi-388	-	Indigenous; Euro-Canadian	Scatter

An examination of the *Ontario Public Register of Archaeological Reports* did not identify any previous archaeological assessments within 50 metres of the study area (Government of Ontario 2024b).

1.4 Existing Conditions

The study area for the Project is located in part of Lot 4, Concession D, Geographic Township of Delaware, now Municipality of Middlesex Centre, Middlesex County, Ontario. The study area comprises municipal parkland, encompassing an area of approximately 0.1 hectares.

2 Field Methods

Prior to the start of the Stage 1 archaeological assessment, the Municipality provided preliminary mapping of the Project's assessment area (i.e., the study area). This mapping was geo-referenced by Stantec's Geographical Information Services (GIS) team and a digital file (i.e., a shape file) was created of the study area. The digital file of the study area was uploaded to ArcGIS Field Maps powered by ESRI, customized by Stantec for archaeological survey and assessment, for digital data recording in the field. Data was recorded in the field on a handheld mobile device paired with a Trimble R1 Global Navigation Satellite System (GNSS) receiver to an accuracy of less than one metre.

Initial background research compiled information concerning registered and/or potential archaeological resources within the study area. A property inspection was conducted on May 16, 2024, by Parker Dickson (P256) under Project Information Form number P256-0801-2024, issued to Parker Dickson, MA by the MCM. The property inspection involved spot-checking the entirety of the study area to identify the presence of absence of features of archaeological potential in accordance with Section 1.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

During the property inspection, the weather was warm and sunny. At no time were field, lighting, or weather conditions detrimental to the identification of features of archaeological potential. The photography from the property inspection is presented in Section 7.1 and confirms that the requirements for a Stage 1 property inspection were met, as per Section 1.2 and Section 7.7.2 Standard 1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

Based on the results of the property inspection, the entirety of the study area (100.0%) consists of manicured lawns within a municipal park. Photo 1 to Photo 4 in illustrate typical examples of these areas.

3 Analysis and Conclusions

Archaeological potential is established by determining the likelihood that archaeological resources may be present within a study area. Stantec applied archaeological potential criteria commonly used by the MCM (Government of Ontario 2011) to determine areas of archaeological potential within the study area. These variables include proximity to registered archaeological sites; distance to various types of water sources; soil texture and drainage; glacial geomorphology; elevated topography; and the general topographic variability of the area. However, it is worth noting that extensive land disturbance can eradicate archaeological potential.

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southern Ontario have remained relatively stable over time, proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to current water is one of the most used variables for predictive modeling of archaeological site location in Ontario. Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential.

As discussed above, distance to water is an essential factor in archaeological potential modeling. When evaluating distance to water it is important to distinguish between water and shoreline, as well as natural and artificial water sources, as these features affect site locations and types to varying degrees. The MCM categorizes water sources in the following manner:

- Primary water sources: lakes, rivers, streams, and creeks.
- Secondary water sources: intermittent streams and creeks, springs, marshes, and swamps.
- Past water sources: glacial lake shorelines, relic river or stream channels, cobble beaches, and shorelines of drained lakes or marshes.
- Accessible or inaccessible shorelines: high bluffs, swamp or marshy lake edges, and sandbars stretching into marsh.

As stated in Section 1.3.1, the Thames River is located approximately 70 metres southwest of the study area. Ancient and/or relic tributaries of other water sources may have existed but are not identifiable today and are not indicated on historical mapping. Soil texture can also be an important determinant of past settlement, usually in combination of other factors such as topography. The soils within the study area were not mapped, due to significant areas of land which have been disturbed, modified, or permanently withdrawn from agricultural use (Hagerty and Kingston 1992). However, the study area is located in a valley complex, which follows along rivers and major tributaries with moderate to very steep slopes along valley sides and flood paints in valley bottoms (Hagerty and Kingston 1992). Thus, it is likely that the original soils would have been suitable for early agricultural practices. Moreover, the location of the study area near the Thames River may have provided for ease of access to the river for fishing and travel. A review of the MCM's *Ontario Archaeological Sites Database* identified 29 Indigenous (or multicomponent) archaeological sites within one kilometre of the study area, including one Woodland

period Indigenous campsite (AfHi-134) within 300 metres of the study area (Government of Ontario 2024a). No archaeological sites were identified within 50 metres of the study area.

Archaeological potential can be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements; early transportation routes; and properties listed on the municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 1990c) or property that local histories or informants have identified with possible historical events, activities, or occupations. Historical mapping demonstrates that the study area was occupied in the mid-to-late 19th century. Much of the established road and rail networks and agricultural settlement from the 19th century are still visible today. As detailed in Section 1.2.2, historical mapping illustrates that the village of Delaware was established by the mid-19th century, encompassing areas around the current study area. Adding to these observations is the presence of three registered Euro-Canadian archaeological sites (and two previously mentioned multicomponent sites) within one kilometre of the study area. No registered Euro-Canadian sites were identified within 300 metres of the current study area.

The Stage 1 property inspection determined that the entirety of the study area (100.0%) consists of manicured lawns within a municipal park.

In summary, the Stage 1 archaeological assessment of the Project, involving background research and a property inspection, determined that 100.0% of the study area retains archaeological potential. Figure 6 illustrates the results of the Stage 1 archaeological assessment.

4 Recommendations

The Stage 1 archaeological assessment of the study area for the Project determined that entirety (100.0%) of the study area retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impact an area of archaeological potential.**

The objective of Stage 2 archaeological assessment is to document archaeological resources within the portions of the study area still retaining archaeological potential and to determine whether these archaeological resources require further assessment. For areas that are actively or recently cultivated, the Stage 2 archaeological assessment must include the systematic walking of open ploughed fields as outlined in Section 2.1.1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MCM standards require that all agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure, but not deeper than previous ploughing, and must provide at least 80% ground surface visibility.

For areas inaccessible for ploughing, the Stage 2 archaeological assessment must include a test pit survey as outlined in Section 2.1.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MCM standards require that each test pit be at least 30 centimetres in diameter, excavated to at least five centimetres into subsoil, and have excavated soil screened through six-millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

If the archaeological field team determines any additional lands to be low and permanently wet, steeply sloped, or disturbed during the Stage 2 field work, those areas will not require survey, but will be photographically documented in accordance with Section 2.1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The MCM is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.

5 Advice on Compliance with Legislation

In accordance with Section 7.5.9 of the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), the following standard statements are a required component of archaeological reporting and are provided from the MCM's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011).

This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c O.18 (Government of Ontario 1990c). 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* (Government of Ontario 1990c) 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 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 Archaeological Reports* referred to in Section 65.1 of the *Ontario Heritage Act* (Government of Ontario 1990c).

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* (Government of Ontario 1990c). 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* (Government of Ontario 1990c).

The *Funeral, Burial and Cremation Services Act,* 2002, S.O. 2002, c.33 (Government of Ontario 2002), 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 Ministry of Business and Public Delivery Services and Procurement is also immediately notified.

Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990c) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

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7 Images

7.1 Photographs

Photo 1: Area of archaeological potential, showing municipal park, facing southwest

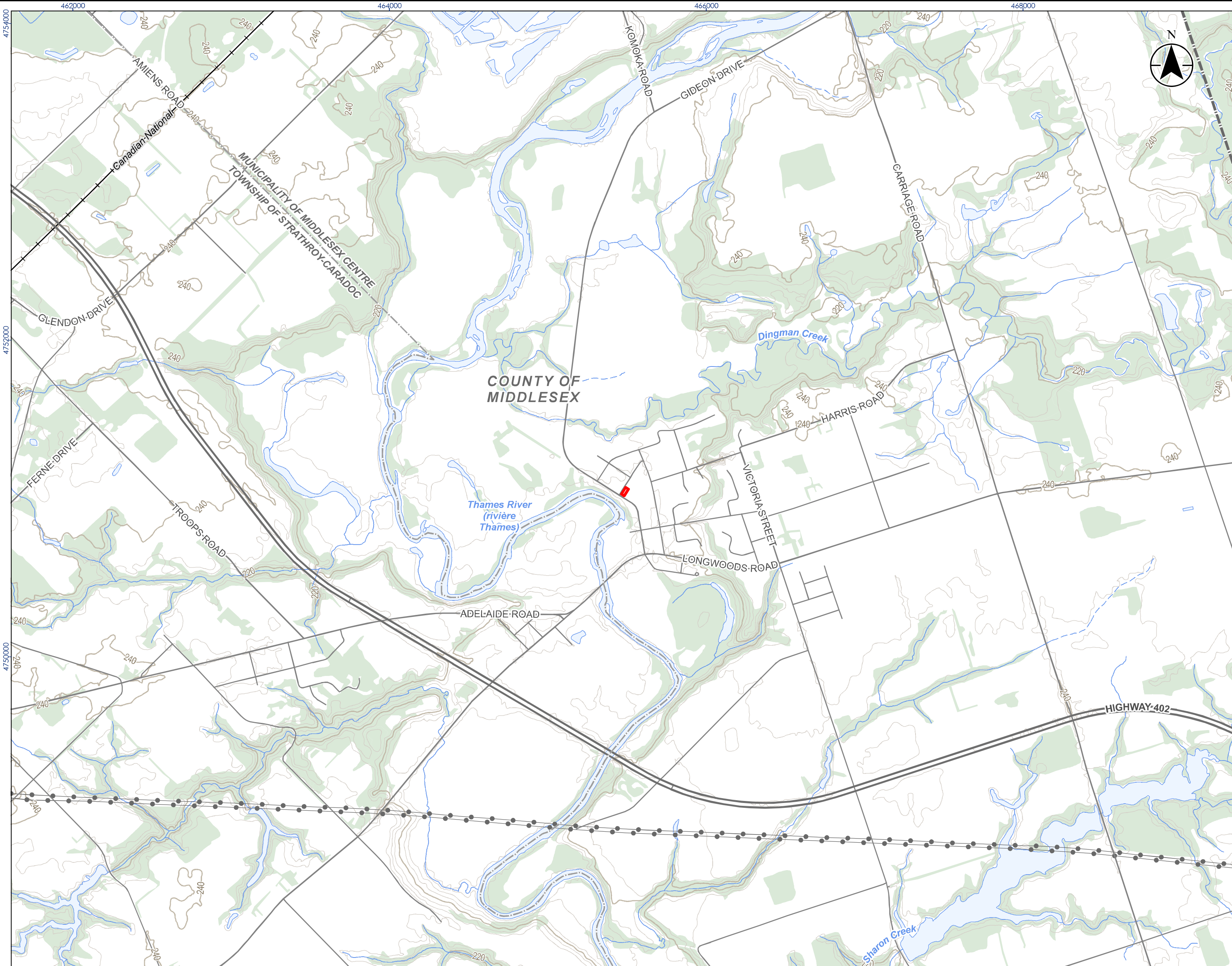
Photo 2: Area of archaeological potential, showing municipal park, facing east-southeast

Photo 3: Area of archaeological potential, showing municipal park, facing north-northeast

Photo 4: Area of archaeological potential, showing municipal park, facing northwest

8 Maps

Maps of the study area for the Stage 1 archaeological assessment follow on succeeding pages.



Stantec

Legend

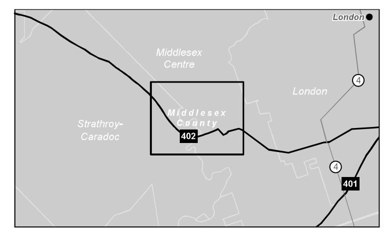
- Study Area
- Highway
- Major Road
- Minor Road
- Railway
- Hydro Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wooded Area
- Municipal Boundary, Upper Tier
- Municipal Boundary, Lower Tier

0 0.5 1 km

1:25,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.



Project Location
Komoka, Ontario

Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
1

Title
Location of the Study Area

Revised: 2024-05-31 By: kaitang

Stantec

Legend

Study Area

0 50 100 Metres

1:1,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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3. Imagery source: Elgin County, Middlesex, Maxar, Microsoft

Project Location
Komoka, Ontario

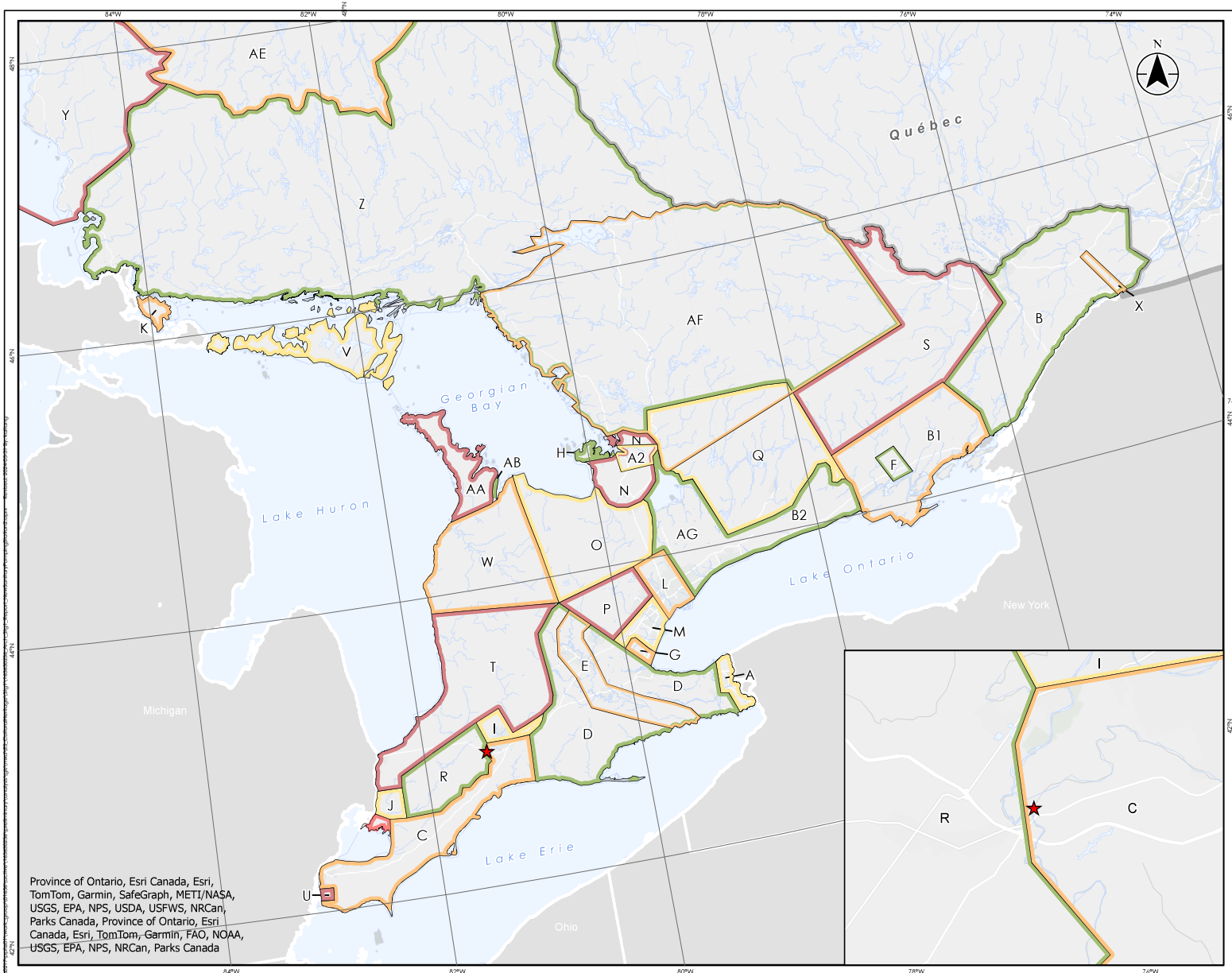
Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
2

Title
Detailed Location of the Study Area

\\Cal0217-ppfss01\work_group\01656\active\165630236\preliminary\analysis\gis\mxd\ES_CulturalHeritage\Stg1\165630236_Arch_Stg1_Report_NewSanitaryPumpingStation2.aprx\165630236_Arch_Stg1_Fig2_LocationOfStudyArea_NewSanitaryPumpingStation2 Revised: 2024-05-31 By: kaitang



Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS, NRCan, Parks Canada, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, NRCan, Parks Canada

Stantec

Legend

- Study Area
- Waterbody

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AE Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
AF Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
AG Williams Treaty, October 31st, 1923 (Chippewa)
A2 John Collins' Purchase, 1785 (Chippewa)
B Crawford's Purchase, October 9th, 1783 (Algonquin and Iroquois)
B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
B2 Crawford's Purchase, 1783, 1787, 1788 (Mississauga)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract: from the Crown to the Mohawk, 1793
F Tyendinaga: from the Crown to the Mohawk, 1793
G Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
I Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
K Treaty No. 11, June 30th, 1798 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No. 16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
V Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians To Reside Thereon")
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Y Treaty No. 60, Robinson, Superior, September 7th, 1850 (Ojibwa)
Z Treaty No. 61, Robinson, Huron, September 9th, 1850 (Ojibwa)

0 50 100 150 Km
1:3,000,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Treaty boundaries adapted from Morris 1943 (1964 reprint). For cartographic representation only.

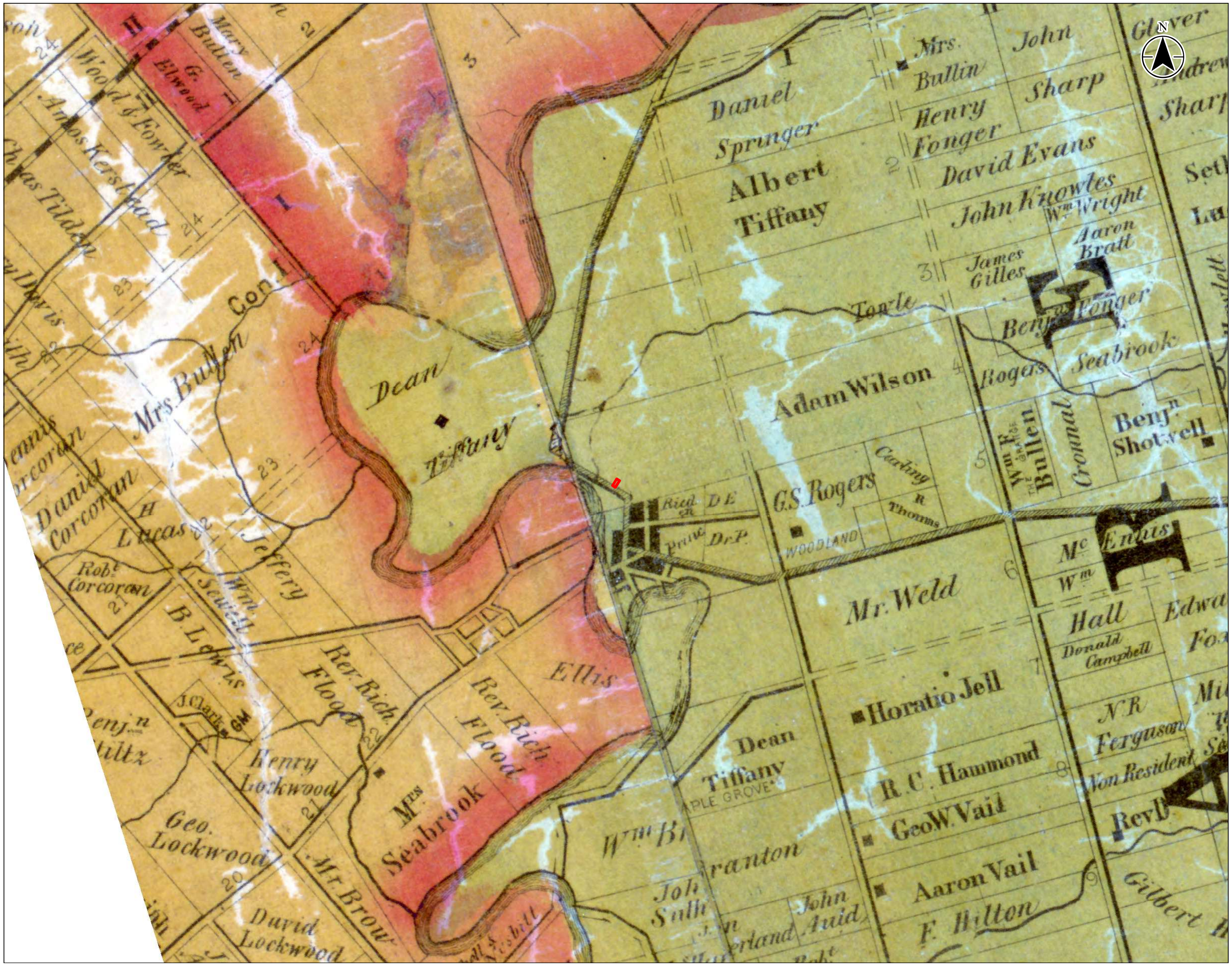
Project Location
Komoka, Ontario

Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
3

Title
Treaties and Purchases (Adapted from Morris 1943)



Legend

Study Area - Approximate Location

Notes
1. Historical information not to scale
2. Reference: Tremaine, George R. 1862. Tremaine's Map of the County of Middlesex, Canada West. Toronto: George R. Tremaine.

Project Location
Komoka, Ontario

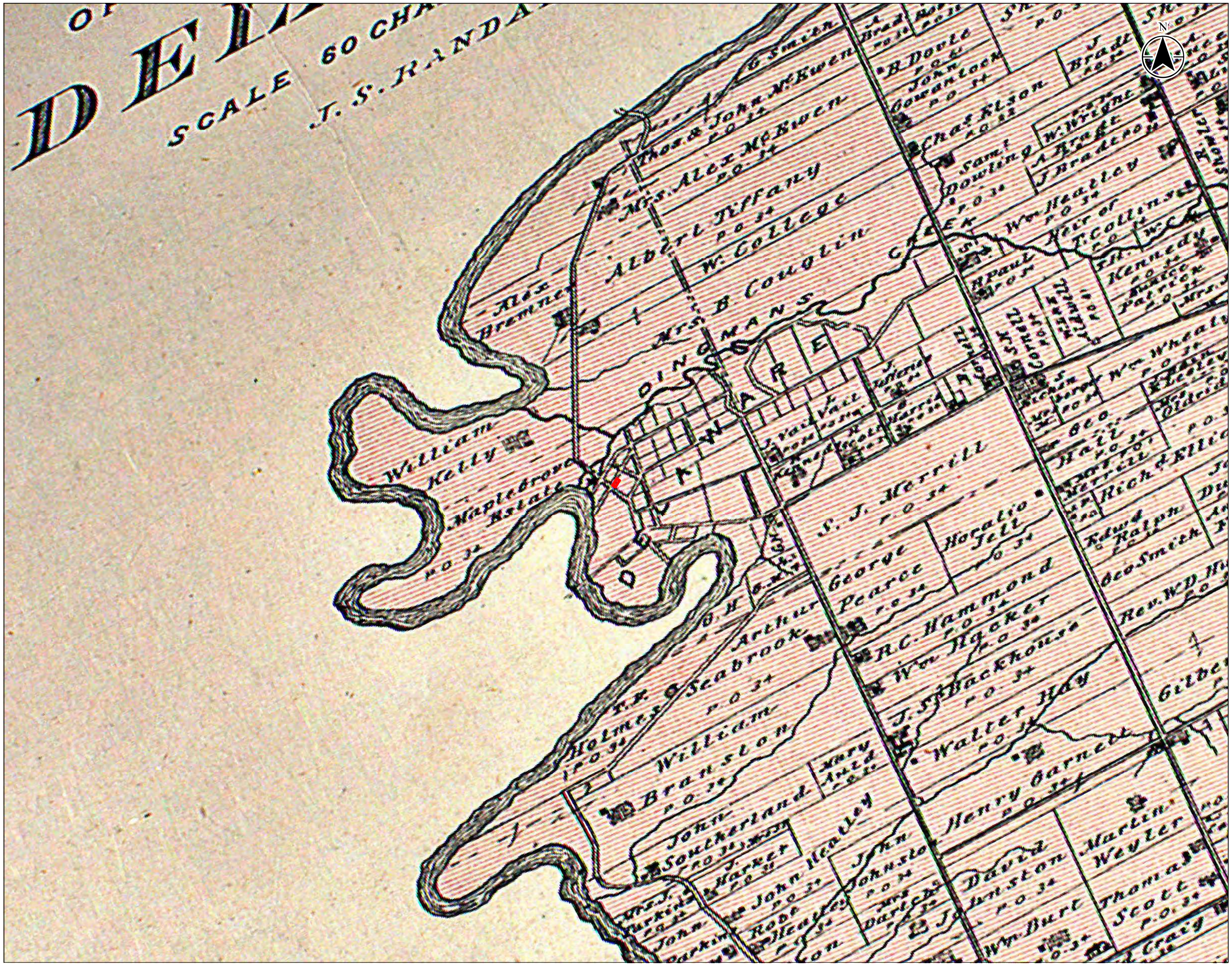
Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
4

Title
Portion of the 1862 Historical County Map of Middlesex County

\\Ca0217-ppfss01\work_group\01656\active\165630236\preliminary\analysis\gis\mxd\ES_CulturalHeritage\Stg1\165630236_Arch_Stg1_Report_NewSanitaryPumpingStation2.aprx Revised: 2024-05-31 By: kaitang



Legend

Study Area - Approximate Location

Notes
1. Historical information not to scale
2. Reference: Page, H. R., and Co. 1877. *Illustrated Historical Atlas of Elgin County*. Toronto: H.R. Page and CO.

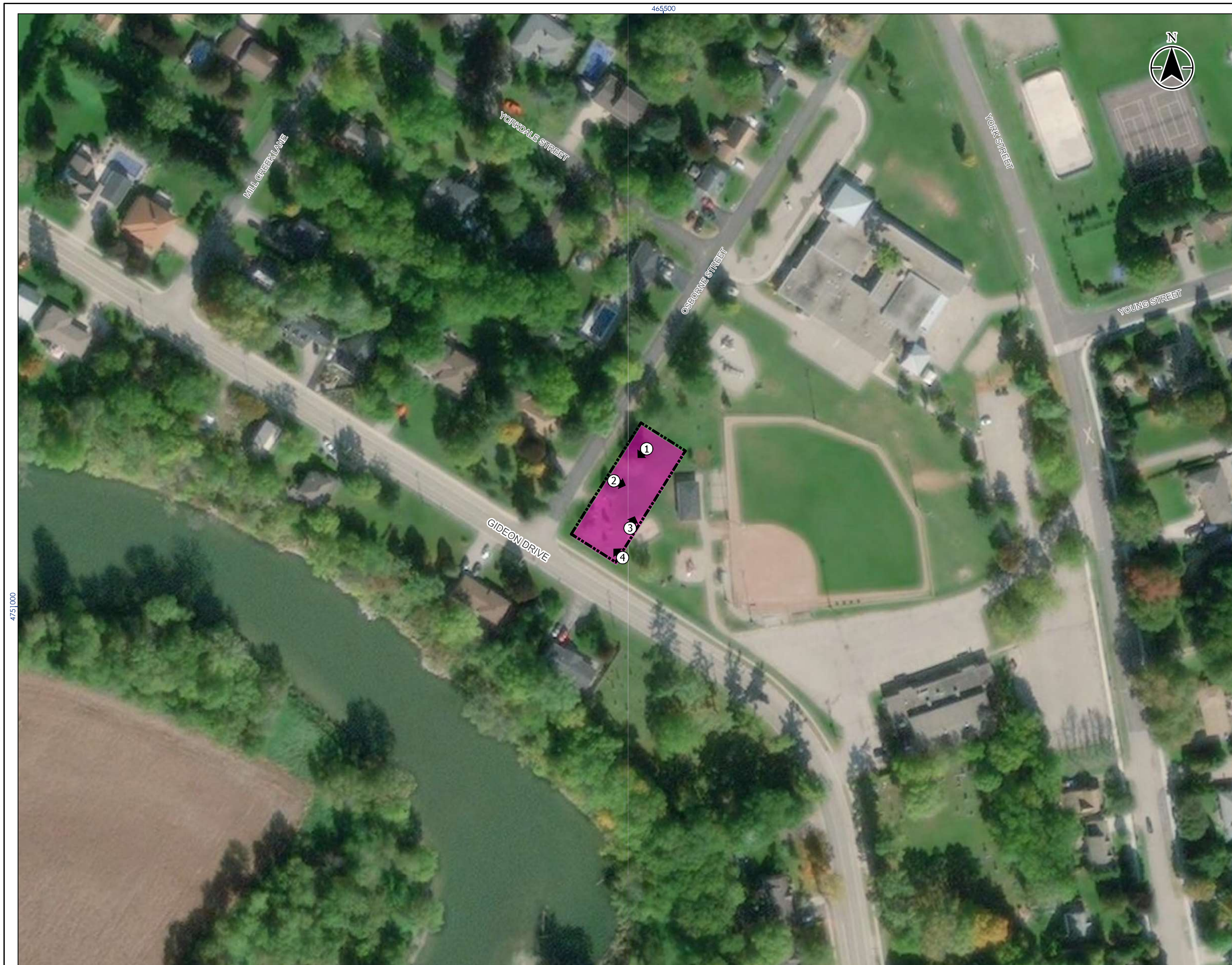
Project Location
Komoka, Ontario

Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
5

Title
Portion of the 1878 Illustrated Historical Atlas of the County of Middlesex



Stantec

Legend

Study Area

Archaeology Photo Log

Archaeological Assessment

Area of Archaeological Potential - Further Archaeological Work Required (Stage 2)

0 50 100 Metres

1:1,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Imagery source: Maxar, Microsoft

Project Location
Komoka, Ontario

Prepared by kaitang on 2024-05-31

Client/Project
MUNICIPALITY OF MIDDLESEX CENTRE
MASTER SERVICING PLAN, STAGE 1 ARCHAEOLOGICAL ASSESSMENT, DELAWARE SANITARY PUMPING STATION #2

Figure No.
6

Title
Stage 1 Archaeological Assessment Results

Revised: 2024-05-31 By: kaitang