

**Stage 1 Archaeological Assessment
(Background Research and Property Inspection)**

**Intersection of Derry Road and Argentia Road
Municipal Class Environmental Assessment
Parts of Lots 10 and 11, Concession 5 West of Centre Road,
Former Township of Toronto, County of Peel
City of Mississauga, Regional Municipality of Peel, Ontario**

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EXECUTIVE SUMMARY

Archaeological Services Inc. (ASI) was contracted by HDR Corporation (Toronto), on behalf of the Regional Municipality of Peel, to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Intersection of Derry Road and Argentia Road Municipal Class Environmental Assessment study. The study area extends along Derry Road and Argentia Road for 300 m from the quadrants of the intersection (except the east quadrant which extends to Highway 401) and 15 m beyond the paved right-of-way (ROW) in the City of Mississauga, Regional Municipality of Peel, Ontario. The purpose/intent of the study is to identify short and long term improvements at the intersection of Derry Road and Argentia Road.

The Stage 1 Archaeological Assessment determined that two previously registered archaeological sites are located within 1 km of the study area. A review of the historical and archaeological contexts of the study area also suggested that it has potential for the identification of Aboriginal and Euro-Canadian archaeological resources. This potential was confirmed for portions of the study area by the property inspection.

The Stage 1 Property Inspection determined that the majority of the study area does not retain archaeological potential on account of documented deep and extensive land disturbance due predominantly to ROW construction. A small section of the study area was documented, however, to possess archaeological potential and require Stage 2 archaeological assessment by test-pit survey at 5 m intervals.

In light of these results, the following recommendations are made:

1. The majority of the Derry and Argentia Road study area does not retain archaeological potential due to deep and extensive disturbance. Further archaeological assessment is not required for these areas;
2. One small section of the study area was documented to possess archaeological potential. These lands require Stage 2 archaeological assessment by test-pit survey at 5 m intervals prior to any land disturbance; and,
3. Should the proposed work extend beyond the current study area then further Stage 1 archaeological assessment must be conducted to determine the archaeological potential of additional lands.



Notwithstanding the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the Ministry of Tourism, Culture and Sport should be immediately notified.



**ARCHAEOLOGICAL SERVICES INC.
ENVIRONMENTAL ASSESSMENT DIVISION**

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1.0 PROJECT CONTEXT

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This assessment was conducted under the project direction and project management of Paul David Ritchie (PIF# P392-0027-2013) and the senior project management of Lisa Merritt (P094), both of ASI.

Section 1 of the Ministry of Tourism and Culture's 2011 document, *Standards and Guidelines for Consultant Archaeologists (S & G)* administered by the Ministry of Tourism, Culture and Sport (MTCS), discusses the objectives of a Stage 1 archaeological assessment as follows:

- To provide information about the geography, history, previous archaeological fieldwork and current land condition of the study area;
- To evaluate in detail the archaeological potential of the study area which can be used, if necessary, to support recommendations for Stage 2 archaeological assessment for all or parts of the property; and
- To recommend appropriate strategies for Stage 2 archaeological assessment, if necessary.

This report describes the Stage 1 archaeological assessment that was conducted for this project and is organized as follows: Section 1.0 summarizes the background study that was conducted to provide the historical and archaeological contexts for the project study area; Section 2.0 addresses the field methods used for the property inspection that was undertaken to document its general environment, current land use history and conditions of the study area; Section 3.0 analyses the characteristics of the project study area and evaluates its archaeological potential; Section 4.0 provides recommendations for the next assessment steps; and the remaining sections contain other report information that is required by the *S & G*, e.g., advice on compliance with legislation, works cited, mapping and photo-documentation.

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted under Schedule B of the Municipal Class EA process.

All activities carried out during this assessment were completed in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (2000, as amended in 2007 and 2011), the Ministry of the Environment document *Code of Practice: Preparing, Reviewing and Using Class Environmental Assessments in Ontario* (2009), the *Ontario Heritage Act* (2005), and the *S & G*.



Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment was granted to ASI by HDR Inc. (Toronto) on September 10, 2013.

1.2 Historical Context

The purpose of this section, according to Section 7.5.7 (1) of the *S & G*, is to describe the past and present land use and the settlement history and any other relevant historical information gathered through the Stage 1 background research. First, a summary is presented of the current understanding of the Aboriginal land use of the study area. This is followed by a review of the historical Euro-Canadian settlement history.

1.2.1 *Aboriginal Land Use and Settlement*

Southern Ontario has been occupied by human populations, if only seasonally, since the retreat of the Laurentide glacier during what is known as the Paleo-Indian period, approximately 11,000 BP (Ellis and Deller 1990). Populations at this period would have been highly mobile, inhabiting a boreal-parkland more similar to the modern sub-arctic. By the end of the 11th millennium BP the environment had progressively warmed (see Section 1.3.2) and populations now occupied less extensive territories (Ellis and Deller 1990: 62-63).

From the 10th to the first half of the 6th millennia BP the Great Lakes' basins experienced low-water levels and so it is likely that many sites which would have been located on those former shorelines are now submerged beneath Lake Ontario. This period produces the earliest evidence of heavy wood working tools and is indicative of greater investment of labour in felling trees for fuel, to build shelter, or to produce crafts and is ultimately indicative of prolonged seasonal residency at sites. By the 8th millennium BP evidence exists for polished stone implements and worked native copper. The latter's source from the north shore of Lake Superior is evidence of extensive exchange networks. By the middle of the 5th millennium BP, during the Late Archaic period the earliest evidence exists at this time of fish weirs and cemeteries, indicative of increased social organization and investment of labour into social infrastructure, increased procurement of food, and establishing territories (Brown 1995: 13; Ellis *et al.* 1990; Ellis *et al.* 2009; *cf.* Sauer 1952)..

The settlement and subsistence systems of the Early Woodland (1000 BC-400 BC) period are not entirely clear. Populations continued a semi-permanent existence and exploited seasonally available resources, and harvesting spawning fish continued to be an important part of their subsistence. Evidence still exists for extensive and complex exchange networks (Spence *et al.* 1990: 136, 138). By the second millennium BP in the Middle Woodland (400 BC-AD 1000) period evidence exists for *macro-band* camps, focussing on the seasonal exploitation of resources such as spawning fish and wild rice (Spence *et al.* 1990: 155, 164). It is also during this period that maize was first introduced into southern Ontario, though it would have only supplemented Middle Woodland people's diet (Birch and Williamson 2013: 13-15). Bands likely retreated to interior camps during the winter. An Early Woodland/Middle Woodland village site is located within 1 km of the study area.

The advent of Iroquoian culture occurs during the Late Woodland (AD 1000-AD 1649) period though full expression of Iroquoian culture is not recognised archaeologically until the fourteenth century AD. An Iroquoian campsite is located within 1 km of the study area. During the Early Iroquoian (AD 1000-AD 1300) phase, the communal site is replaced by the village focussed on agriculture. Seasonal disintegration



of the community for the exploitation of a wider territory and more varied resource bases was still practised (Williamson 1990: 317). By the second quarter of the first millennium BP, during the Middle Iroquoian (AD 1300-AD 1450) phase, this episodic community disintegration was no longer practised and populations now communally occupied sites year round (Dodd *et al.* 1990: 343). In the Late Iroquoian (AD 1450-AD 1649) phase this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations as described historically by the French and English explorers who first visited southern Ontario was developed.

The study area is located within the Credit River drainage Late Woodland settlement sequence. Settlement in the Credit River drainage is documented from the beginning of the fourteenth century (ASI 2010: Antrex site) until the mid-sixteenth century (Hawkins 2004: Emerson Springs site; Crawford 2003: Wallace site). By the turn of the seventeenth century the Credit River populations are believed to have relocated to join either the Huron-Wendat Nation or perhaps more likely the Tionontaté (Petun) Nation (Birch and Williamson 2013: 40).

By AD 1600, most of the Aboriginal communities located on the north shore of Lake Ontario had moved inland. The Five Nations Iroquois, and in particular the Seneca, however, were still using the central north shore of Lake Ontario for hunting, fishing, and for participation in the fur trade. The main settlements were located near the mouths of the Humber and Rouge Rivers, two branches of the Toronto Carrying Place, which was the route that linked Lake Ontario to the upper Great Lakes through Lake Simcoe.

The contact period for the north shore of Lake Ontario begins in the early seventeenth century with the arrival of French explorers, traders and missionaries. The ancestral Huron-Wendat are thought to have been the main group who controlled the region and the presence of European trade goods is first evident in the mid-sixteenth century where European artifacts start to make an appearance at some ancestral Huron-Wendat sites. The occurrence of European artifacts on Huron-Wendat sites increases towards the end of the sixteenth century as the interaction between the Huron-Wendat and French explorers, traders, and missionaries continued to increase in frequency and intensity.

The Petun, were closely allied to the Huron-Wendat in speech and culture, and are thought to have also originated from the north shore of Lake Ontario before settling in the area between Nottawasaga Bay and the Niagara Escarpment, west of Huronia, near present day Collingwood (Ramsden 1990). It is speculated that the Huron-Wendat and the Petun may have formed a single group prior to the seventeenth century given the close similarities of their cultural traditions. It is estimated that the Petun population was approximately 7,000 people by the mid sixteenth century. The Petun were noted for growing large amounts of tobacco.

Other than their specialization in growing tobacco, the Petun do not appear to have possessed a single trait that they do not share with Huron-Wendat culture including their social and economic organization, which had been well established by the sixteenth century (Garrad and Heidenreich 1978: 394-397; Trigger 1994). The Huron-Wendat and the Petun were both sedentary agriculturalist peoples and cultivated corn, beans, and squash. The fields were tended by women (Trigger 1994). The Petun and Huron-Wendat also shared the same beliefs in sorcery, spirits, curing feats, and other ceremonies.

In 1616 Samuel de Champlain found eight villages occupied by the Petun and mentioned that two more were under construction (Garrad and Heidenreich 1978). By 1639 the Jesuits listed nine Petun villages in addition to a number of smaller settlements. While there is historic information regarding the number of



Petun settlements, no information was gathered concerning the size of the Petun Nation. It is now estimated that the Petun population neared 3,000 by the time of European contact.

Petun relations were particularly close with the Huron-Wendat Attignawantan group. In the second half of the seventeenth century some Petun and a large part of the Attignawantan combined to become the Wyandot tribe, whose territory is located west of Lake Huron. The Huron-Wendat were eventually dispersed by the Five Nations Iroquois at which point the Seneca mainly took over control of the southern Ontario region (Ramsden 1990).

Compared to settlements of the New York Iroquois, the “Iroquois du Nord” occupation of the landscape was less intensive. Only seven villages are identified by the early historic cartographers on the north shore and they are documented as considerably smaller than those in New York State. The populations were agriculturalists, growing maize, pumpkins and squash. These settlements also played the important alternate role of serving as stopovers and bases for New York Iroquois travelling to the north shore for the annual beaver hunt (Konrad 1974).

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Aboriginal pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls for Great Lakes traffic and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Aboriginal trails, both along the lakeshore and adjacent to various creeks and rivers with the primary north-south route being the Carrying Place Trail, which connected Lake Ontario, via the Humber River and other waterways and trails, to Georgian Bay (ASI 2006).

Beginning in the mid-late seventeenth century, the Mississaugas began to replace the Seneca as the controlling Aboriginal group along the north shore of Lake Ontario since the Iroquois confederacy had overstretched their territory between the 1650s and 1670s (Williamson 2008). The Iroquois could not hold the region and agreed to form an alliance with the Mississauga peoples and share hunting territories with them. In the late 1690s, the Mississaugas established their settlement of Teiaiagon on the Humber River, which sat astride the most important route of the Toronto Passage. This route connected Lake Ontario with waterways and trails to Georgian Bay and the north and gave the Mississaugas a strategic trading position (Williamson 2008). The Mississaugas traded with both the British and the French in order to have wider access to European materials at better prices, and used their strategic position on the Humber to act as trade intermediaries between the British and tribes in the north. By 1805, the lands from Burlington Bay to the Etobicoke River north of Eglinton Avenue were known as the “Mississague Tract” (Boulton 1805: 48; Heritage Mississauga 2012: 18; Smith 2002). The Mississaugas were also granted one mile (approximately 1.6 km) on either side of the Credit River, Twelve Mile Creek and Sixteen Mile Creek. In 1818, the majority of the Mississauga Tract was acquired by the Crown excluding the lands tracts flanking the Credit River, Twelve Mile Creek and Sixteen Mile Creek. In 1820, the remainder of Mississauga land was surrendered except approximately 81 hectares (ha) along the Credit River (Heritage Mississauga 2012: 18).

The First Nations occupation in the study area undoubtedly overlapped with the influx of Euro-Canadian settlers. In 1825-26 the Credit Indian Village was established as an agricultural community and Methodist mission near present day Port Credit (Heritage Mississauga 2009a; MNCFN n.d.). By 1840 the village was under significant pressure from Euro-Canadian settlement that plans begun to relocate the settlement. In 1847 the Credit Mississaugas were made a land offer by the Six Nations Council to relocate at the



Grand River. In 1847, 266 Mississaugas settled at New Credit, approximately 23 km southwest of Brantford. In 1848 a mission of the Methodist Church was established there by Rev. William Ryerson (WICEC 1985). Although the majority of the former Mississague Tract had been surrendered from the Mississauga by 1856 (Gould 1981), this does not exclude the likelihood that the Mississauga continued to utilise the landscape at large during travel (Ambrose 1982) and for resource extraction.

1.2.2 Historic Euro-Canadian Land Use: Township Survey and Settlement

Historically, the study area is located in Lots 10 and 11, Concession 5 west of Centre Road in the Former Township of Toronto, County of Peel.

The *S & G* (Section 1.3.1) stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and early cemeteries, are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those which are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

County of Peel

In 1788, the County of Peel was part of the extensive district known as the “Nassau District,” later called the “Home District.” Following the division of Quebec into Upper and Lower Canada in 1792, the territory was further separated into nineteen counties. By 1852, the entire institution of districts was abolished and the late Home Districts were represented by the Counties of York, Ontario and Peel. Shortly after, the County of Ontario became a separate county, and the question of separation became popular in Peel. A vote for independence was taken in 1866, and in 1867 the village of Brampton was chosen as the capital of the new county (Pope 1877: 58-59).

Toronto Township

Toronto Township was original survey in 1806 by Mr. Wilmot, Deputy Surveyor. The first settler in this township, and also the County of Peel, was Colonel Thomas Ingersoll. The whole population of the township in 1808 consisted of seven families, scattered along Dundas Street. The number of inhabitants gradually increased until the outbreak of the War of 1812. When the war was over, the township’s growth revived and the rear part of the township was surveyed and called the “New Survey”. The greater part of the New Survey was granted to a colony of Irish settlers from New York City, who suffered persecution during the war (Pope 1877: 61).

Credit Valley Railway

The Credit Valley Railway was constructed between 1877 and 1879. The project was backed by George



Laidlaw and was intended to connect Toronto with Orangeville via Streetsville. Construction began in 1874 and over several subsequent years several branches were added to the proposed line. The first section of track from Parkdale (Toronto) to Milton was opened in 1877. The line was completed in 1881 but nearly bankrupted the company. In 1883 the line was taken over by the Canadian Pacific Railway (Heritage Mississauga 2009b).

1.2.3 Historic Map Review

The 1877 *Illustrated Historical Atlas of the County of Peel* was reviewed to determine the potential for the presence of historical archaeological remains along the study area during the nineteenth century (Figure 2). It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

Historically, the study area formed part of Lots 10 and 11, Concession 5 west of Centre Road in the Former Township of Toronto, County of Peel. The available data regarding property owners and historical features gathered from the historic mapping is summarized in Table 1.

Table 1: Nineteenth-century property owners and historical features
1877 Illustrated Historical Atlas of the County of Peel

Lot #	Con#	Property Owner	Historical Feature(s)
10	5 West of Centre Road	Jno Mason	CVR; orchard; driveway
11	5 West of Centre Road	Josh Switzer	CVR; orchard; schoolhouse
11	5 West of Centre Road	Thos. McClure	

CVR – Credit Valley Railway

Transportation and communication networks are important because they serve to integrate social and economic activities between disparate settlement centres. As these settlements grew, and traffic increased between them, toll gates, taverns, hotels and other services for travellers were established where major transportation routes were crossed. Early overland routes followed the natural topography, avoiding swamps or rocky outcrops. The historic thoroughfares within the study corridor, however, were opened along the straight survey lines, creating the familiar grid system of Lots and Concessions. The mapping indicates that Derry Road West is an historic road. The mapping also indicates that the CPR line at the western limit of the study area was former the Credit Valley Railway.

Topographic maps dating from 1909 to 1960 have been reviewed to examine the development of the study area during the course of the twentieth century. The 1909 map illustrates the study area as relatively unchanged since 1877. The 1909 map does not indicate a structure corresponding with the location of the ‘Jno Mason’ house on the 1877 map, implying that the house was demolished by 1909 (Figure 3). Considering the relative locations of other map features (notably the tree stand which may be the ‘Jno Mason’ orchard), however, the stone/brick structure indicated east of Mullet Creek may in fact be the ‘Jno Mason’ house which may have been incorrectly positioned on the 1877 map as west of Mullet Creek. In the latter case, this would indicate that this historic house is within the immediate proximity if not included in the study area. The school house indicated on the 1877 map is also indicated on the 1909 map (Dept. of Militia and Defence 1909). The 1960 map demonstrates that the landscape was still very rural at this time. The schoolhouse, the ‘Jno Mason’ house and the ‘Josh Switzer’ house are all indicated on this

map. It demonstrates that even by 1960 the landscape had changed very little since 1877 (Dept. of National Defence 1960).

1.2.4 Summary of Historical Context

The background research and historic mapping demonstrates that the study area is located within Lots 10 and 11, Concession 5 west of Centre Road, in the Former Township of Toronto, County of Peel. The 1877 *Illustrated Atlas of the County of Peel* indicates that the study area includes or abuts the location of an historic schoolhouse and that the CPR line and Derry Road West are historic transportation routes. The 1909 topographic map indicates that the 'Jno Mason' house may have been mis-located on the 1877 map and if so is located in the immediate proximity if not within the study area (Figures 2 and 3).

The background research also demonstrates that the study area is located within the documented Late Woodland settlement sequence of the Credit River watershed. Further, the study area would have been utilised for resource extraction by Seneca peoples in the early to mid-seventeenth century AD and by Mississauga peoples from the mid-late seventeenth century until the mid-nineteenth century AD. The study area therefore possesses potential for the recovery of Aboriginal archaeological resources.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the study area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites housed at the MTCS; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

The study area is located within a suburban landscape surrounded immediately with medium density commercial/industrial land use. The study area stretches for 300 m from the quadrants of the intersection (except the east quadrant which extends to Highway 401) and 15 m beyond the paved ROW. The study area predominantly consists of the right-of-way (ROW) of Derry Road West and Argentia Road however includes some lands beyond the ROW. The study area is located between the CPR line and Highway 401.

1.3.2 Geography

In addition to the known archaeological sites and historic features, the state of the natural environment is an important indicator of archaeological potential. Accordingly, a description of the study area geography, physiography and soils is provided below.

Section 1.3.1 of the *S & G* stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate



archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990: Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Section 1.3.1 of the *S & G* also lists other geographic characteristics that can indicate archaeological potential including: 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. Physical indicators of use may be present, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential.

The study corridor is situated within the Peel Plain physiographic region of southern Ontario upon bevelled till plain. The Peel Plain is a level-to-undulating area of clay soil which covers an area of 77,700 ha across the central portions of the Regional Municipalities of York, Peel, and Halton. The Peel Plain has a general elevation of between 500 and 750 feet above sea level with a gradual uniform slope towards Lake Ontario. The Peel Plain is sectioned by the Credit, Humber, Don, and Rouge Rivers with deep valleys as well as a number of other streams such as the Bronte, Oakville, and Etobicoke Creeks. These valleys are in places bordered by trains of sandy alluvium. The region is devoid of large undrained depressions, swamps, and bogs though nevertheless the dominant soil possesses imperfect drainage. The Peel Plain overlies shale and limestone till which in many places is veneered by occasionally varved clay. This clay is heavy in texture and more calcareous than the underlying till and was presumably deposited by meltwater from limestone regions and deposited in a temporary lake impounded by higher ground and the ice lobe of the Lake Ontario basin.

The Peel Plain straddles across the contact of the grey and red shales of the Georgian Bay and Queenston Formations, respectively, which consequently gives the clay southwest of the Credit River a more reddish hue and lower lime content than the clay in the eastern part of the plain. Additionally the region exhibits exceptional isolated tracts of sandy soil specifically in the former Township of Trafalgar, near Unionville and north of Brampton where in the latter location there is a partly buried esker. The region does not possess any good aquifers and the high level of evaporation from the clay's now deforested surface is a disabling factor in ground-water recharge. Further, deep groundwater accessed by boring is often found to be saline (Chapman and Putnam 1984: 174-175).

Figure 3 shows the surficial geology of the study area. This map indicates that the study area contains areas of sand and diamicton (poorly sorted sediments). Figure 4 shows the soil drainage of the study area. This map indicates that the study area includes areas of poorly drained soils.

Soils within the study area consist of Chinguacousy clay loam, Oneida clay loam, Bottom Lands, and Jeddo clay (Experimental Farms Service 1953). Chinguacousy clay loam has developed in glacial drift and has imperfect drainage. This soil is found on gently sloping positions in the landscape and overlies red and gray shales, demonstrating variable depth with frequent shale outcroppings. This till was derived from locally occurring brown shale, sandstones, and fossiliferous limestone with a minor component of red



shale. Chinguacousy soils are dark grayish brown in colour at the surface-cultivated layer which is generally friable and easily worked (Hoffman and Richards 1953: 42-43).

Oneida soils are moderately well-drained and have developed on fine textured glacial till, largely composed of ice-ground materials from the underlying Ordovician rock. In the Peel Plain Oneida soil is associated with the landscape of smooth oval ridges having slopes less than 7%. The surface texture of Oneida clay loam is the result of postglacial wind and water action. Oneida clay loam has a typical pH of 5.5 in the surface horizon which is the result of gravel grad carbonates in the soil and the ease of weathering in the shaley material. The plow layer is friable and easily tilled except on eroded surfaces where plowing has incorporated the subsoil into the surface horizon. Oneida soil has developed on gray-brown material but in some areas may have more than normal amounts of incorporated red shale (Hoffman and Richards 1953: 40-42).

Jeddo clay loam is a poorly soil with a very dark brown colour. This soil is typically acidic. This soil has a smooth very gently sloping topography. Natural vegetation consists of mainly elm, ash and cedar (Hoffman and Richards 1953: 44).

Bottom Lands are low-lying soils along stream courses that are subject to flooding. They are immature soils with little horizon differentiation. They typically have poor drainage. Vegetation consists of willow, elm and cedar or bulrushes, sedges and marsh grasses in land which is flooded for most of the year (Hoffman and Richards 1953: 63)

The study area is located in proximity to a branch of Mullet Creek, a tributary of the Credit River. The Credit River is approximately 90 km long and its watershed features both Carolinian and Deciduous forests (CVCA n.d.). The watershed drains approximately 100,000 ha (CVCA 2006). The Credit River's headwaters originate at the Niagara Escarpment north of Caledon Township. The river transits the South Slope and Peel Plain physiographic regions until meeting its confluence with Lake Ontario at Port Credit, in the Iroquois Plain physiographic region.

Palaeontological evidence can provide some information on the past environment of the region of the study areas. Isotope studies of Oxygen-18 and Carbon-13 can provide information on past climate conditions. By comparing quantities of Oxygen-18 and Carbon-13 in marl deposits with quantities found in normal meteoric water it is possible to estimate past temperatures and relative humidity. Following the retreat of the Laurentide glacier at approximately 12,000 BP, southern Ontario began to warm up. Until approximately 7,500 BP the temperature was still below that of modern day and the climate was also very dry. Between 7,500 BP and 5,800 BP the climate of southern Ontario remained dry but was approximately 2° C warmer than the modern day average. Between approximately 5,800 BP and 1,500 BP the climate continued to be warmer than the modern day and but was now a very moist climate. After 1,500 BP the temperature began to get cooler until reaching the present day climate (Edwards and Fritz 1988).

Pollen cores inform about the vegetation of past environment. By approximately 11,000 BP southern Ontario was predominantly a spruce parkland. By approximately 10,000 BP this had transformed into a predominantly pine woodland. This pine woodland dominated until approximately 4,000 BP, at which point the environment transitioned into a mixed deciduous-coniferous forest of birch, maple, beech and hemlock. This woodland persisted until the beginnings of European settlement in southern Ontario, at which time the forests were cleared and the region began to be dominated by meadow species and birch (Bernabo and Webb 1976; McAndrews 1981).



Following the retreat of the glacier the southern Ontario was a boreal like environment and supported a sub-arctic ecosystem including extinct megafauna. By between 10,000 BP and 7,000 BP the mixed coniferous-deciduous woodland would likely have been inhabited by more familiar species such as caribou or other *cervids*. By 2,000 BP the ecosystem would have been similar to that of the present day.

1.3.3 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The study area under review is located in Borden block *AjGw*.

According to the OASD (MTCS 2013), twenty-one previously registered archaeological sites are located within 1 km of the study area. These sites are summarised in Table 2.

Neither of these two sites are located within 300 m of the study area.

Table 2: List of previously registered within 1 km of the study area

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGw-71	Mullet Ponds	Early/Middle Woodland	Village	Lennox and Murphy [MCC] 1987
AjGw-205	New Parcel	Iroquoian	Campsite	MTO 1990

MCC – Ministry of Citizenship and Culture
MTO – Ministry of Transportation of Ontario

According to the background research, one previous archaeological assessment has been conducted within 50 m of the study area (ASI 2007). The assessment is reviewed below.

ASI (2007) conducted a Stage 1 archaeological assessment of the proposed 600 mm feedermain from Meadowvale North pumping station to the 400 mm watermain on Millcreek Drive in the Regional Municipality of Peel, Ontario under the project direction of Rob Pihl (MCL PIF# P057-341-2006). The Stage 1 archaeological assessment determined that some lands within the ASI (2007) study area possessed archaeological potential however lands which overlap with the present study area do not retain archaeological potential.

1.3.4 Summary of Archaeological Context

The review of archaeological work conducted in the area demonstrated that two previously registered archaeological sites are located within 1 km of the study area.

The study area is located in proximity of to a branch of Mullet Creek, a tributary of the Credit River. The study area is situated within immediate proximity of historic homesteads and includes Derry Road which is a historic transportation route. These criteria are indicative that the study area has the potential for the recovery of Aboriginal and Euro-Canadian archaeological resources.



2.0 FIELD METHODS

The Stage 1 property inspection was conducted by Rob Pihl (P057) and Paul David Ritchie (P392), both of ASI, on October 8, 2013, in order to gain first-hand knowledge of the geography, topography, and current conditions and to evaluate and map archaeological potential of the study area. It was a visual inspection only and did not include excavation or collection of archaeological resources.

Weather conditions for the inspection were partly cloudy with temperatures of approximately 18°C. Previously identified features of archaeological potential were examined; additional features of archaeological potential not visible on mapping were identified and documented as well as any features that will affect assessment strategies. Field observations are compiled onto maps of the study areas in Section 7.0 (Figures 6-10) and associated photography is presented in Section 8.0 (Plates 1-20).

3.0 ANALYSIS AND CONCLUSIONS

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the study area. This data is presented below in Section 3.1. Results of the analysis of the property inspection are then presented for the study area in Section 3.2.

3.1 Analysis of Archaeological Potential

The *S & G* list criteria which indicate where archaeological resources are most likely to be found (Section 1.3.1). The study area meets the following criteria indicative of archaeological potential:

- Water sources: primary, secondary, or past water source (e.g. Mullet Creek);
- Areas of Euro-Canadian settlement (e.g. school house; farmsteads);
- Early historic transportation routes (e.g. Derry Road West).

These criteria characterize the study area as having potential for the identification of Aboriginal and Euro-Canadian archaeological resources.

3.2 Analysis of Property Inspection Results

The majority of the study area does not retain archaeological potential on account of documented deep and extensive land disturbance (Figures 6-10: areas marked in yellow), predominantly due to ROW construction. Typically, a ROW can be divided into two areas: the disturbed ROW, and ROW lands beyond the disturbed ROW. The typically disturbed ROW extends outwards from either side of the centerline of the traveled lanes, and it includes the traveled lanes and shoulders and extends to the toe of the fill slope, the top of the cut slope, or the outside edge of the drainage ditch, whichever is furthest from the centerline. Subsurface disturbance within these lands may be considered extreme and pervasive, thereby negating any archaeological potential for such lands.

ROW construction disturbance may be found to extend beyond the typical disturbed ROW area, and this generally includes additional grading, cutting and filling, additional drainage ditching, watercourse alteration or channelization, servicing, removals, intensive landscaping, and heavy construction traffic.



Areas beyond the typically disturbed ROW generally require archaeological assessment in order to determine archaeological potential relative to the type or scale of disturbances that may have occurred in these zones. No further archaeological assessment is required on these lands.

A small section of the study area was documented to possess archaeological potential (Figure 9: areas marked in green) and will require Stage 2 archaeological assessment by test-pit survey at 5 m intervals, prior to any land disturbance, if it is to be impacted by the project.

3.3 Conclusions

The Stage 1 archaeological assessment was conducted to assist with the Intersection of Derry Road and Argentia Road Municipal Class EA. The assessment determined that two previously registered archaeological sites are located within 1 km of the study area. A review of the historical and archaeological contexts of the study area has suggested that it possesses potential for the identification of Aboriginal and Euro-Canadian archaeological resources.

The property inspection confirmed that while the majority of the study area does not retain archaeological potential due to deep and pervasive disturbances, a small area in close proximity to Mullett Creek retains archaeological potential and will require Stage 2 archaeological assessment prior to land disturbance, if the area is to be impacted by the project.

4.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. The majority of the Derry Road and Argentia Road study area does not retain archaeological potential due to deep and extensive land disturbance (Figures 6-10: areas marked in yellow). These areas do not require further archaeological assessment;
2. One small section of the study area possesses archaeological potential (Figure 9: areas marked in green) This area requires Stage 2 archaeological assessment by test-pit survey at 5 m intervals, prior to any land disturbance; and,
3. Should the proposed work extend beyond the current study area then further Stage 1 archaeological assessment must be conducted to determine the archaeological potential of additional lands.

Notwithstanding the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.



5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 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 field work and report recommendations ensure the conservation, preservation and protection 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 MTCS, 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 field work 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 sec. 48 (1) of the *Ontario Heritage Act*;
- The *Cemeteries Act*, R.S.O 1990 c. C.4 (as amended in 2012) and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002. c.33 requires that any person discovering human remains must immediately notify the police or coroner; and,
- The documentation related to this archaeological assessment will be curated by ASI until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the Ontario MTCS, and any other legitimate interest groups.



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7.0 MAPS



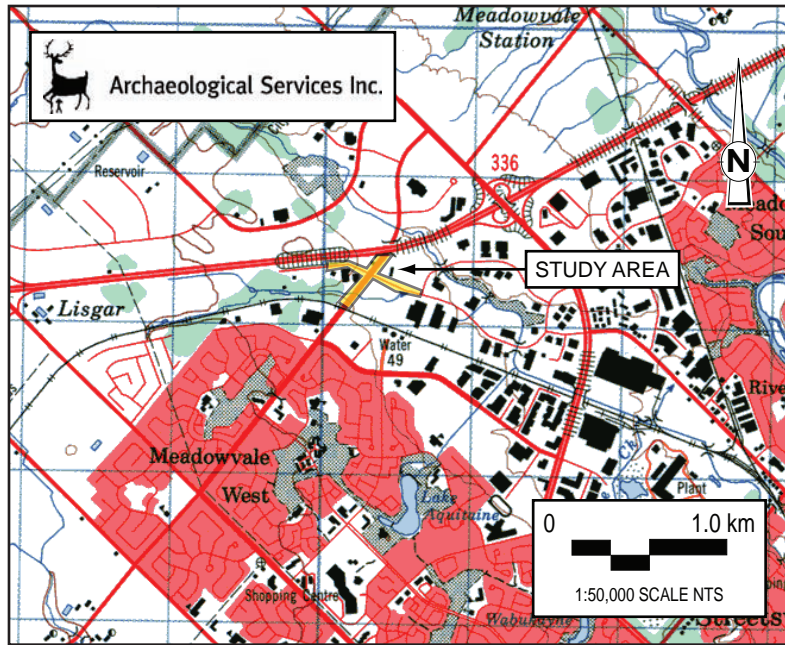


Figure 1: Study area
(approximate location)

Base map:
(NTS 30 M/12)

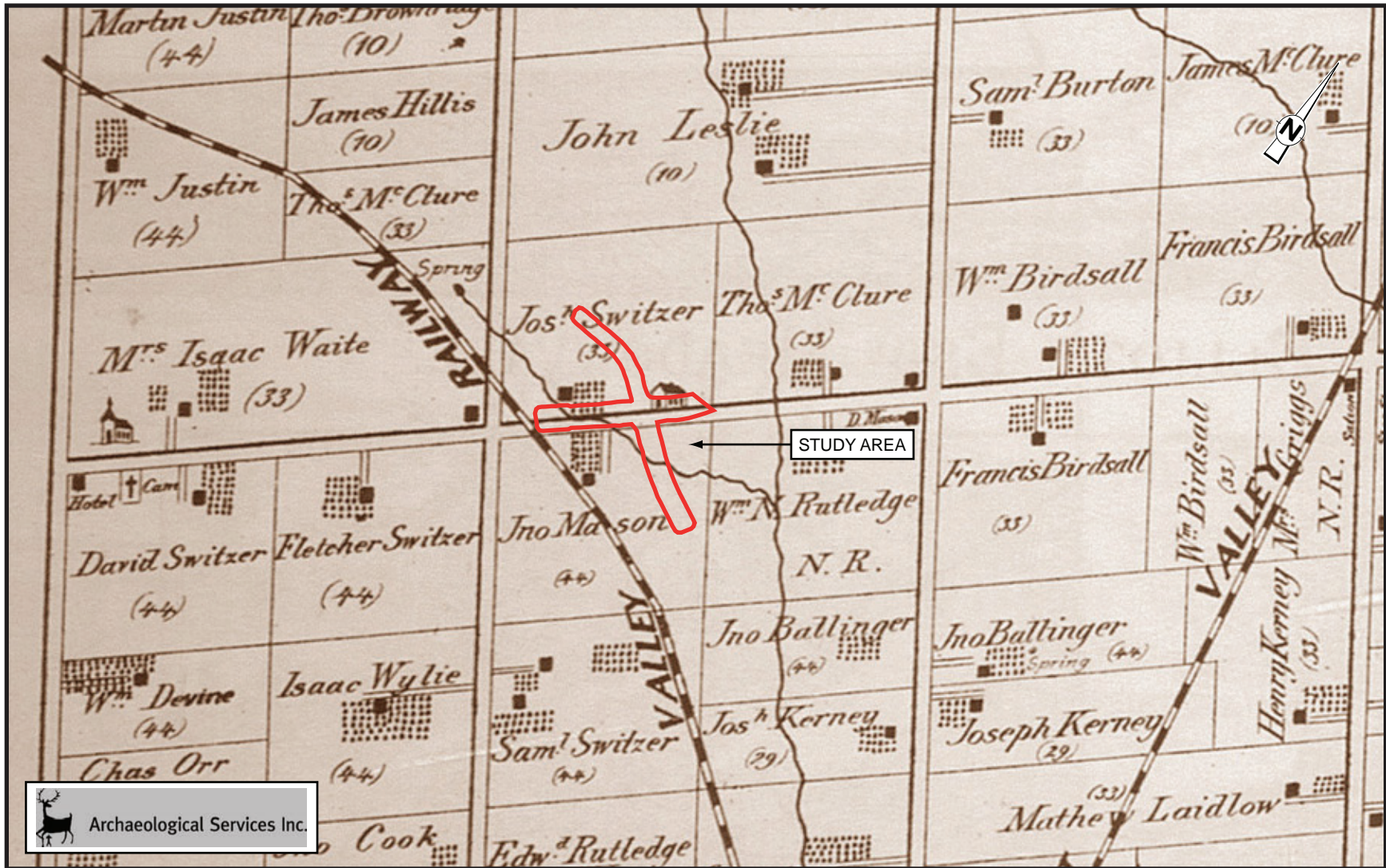


Figure 2: Study area (approximate location) overlaid on 1877 map of northern part of Toronto Township

Base map: (Pope 1877)

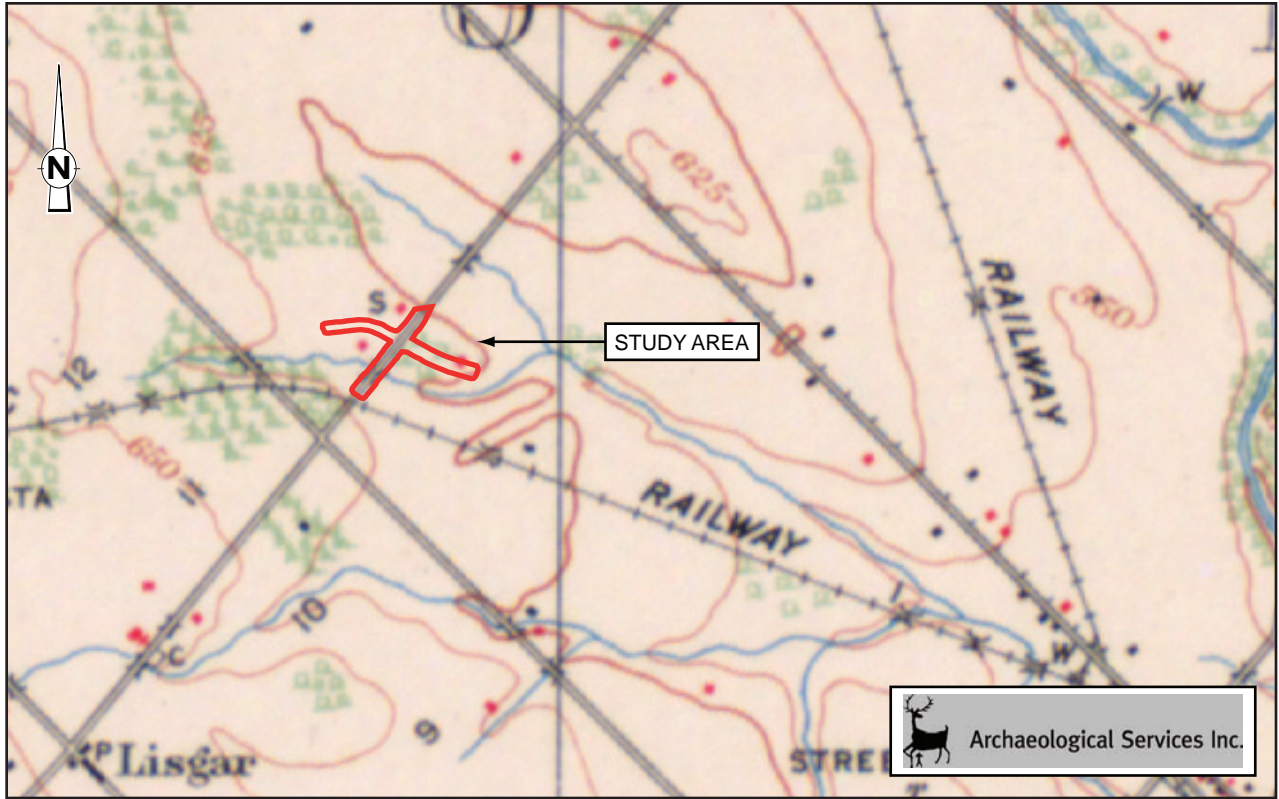
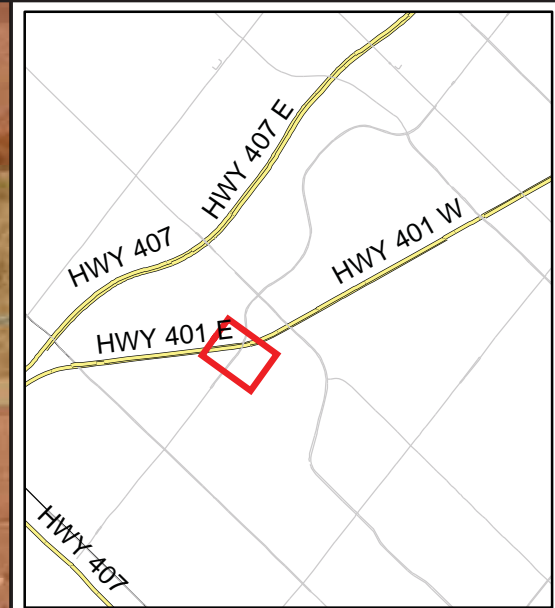
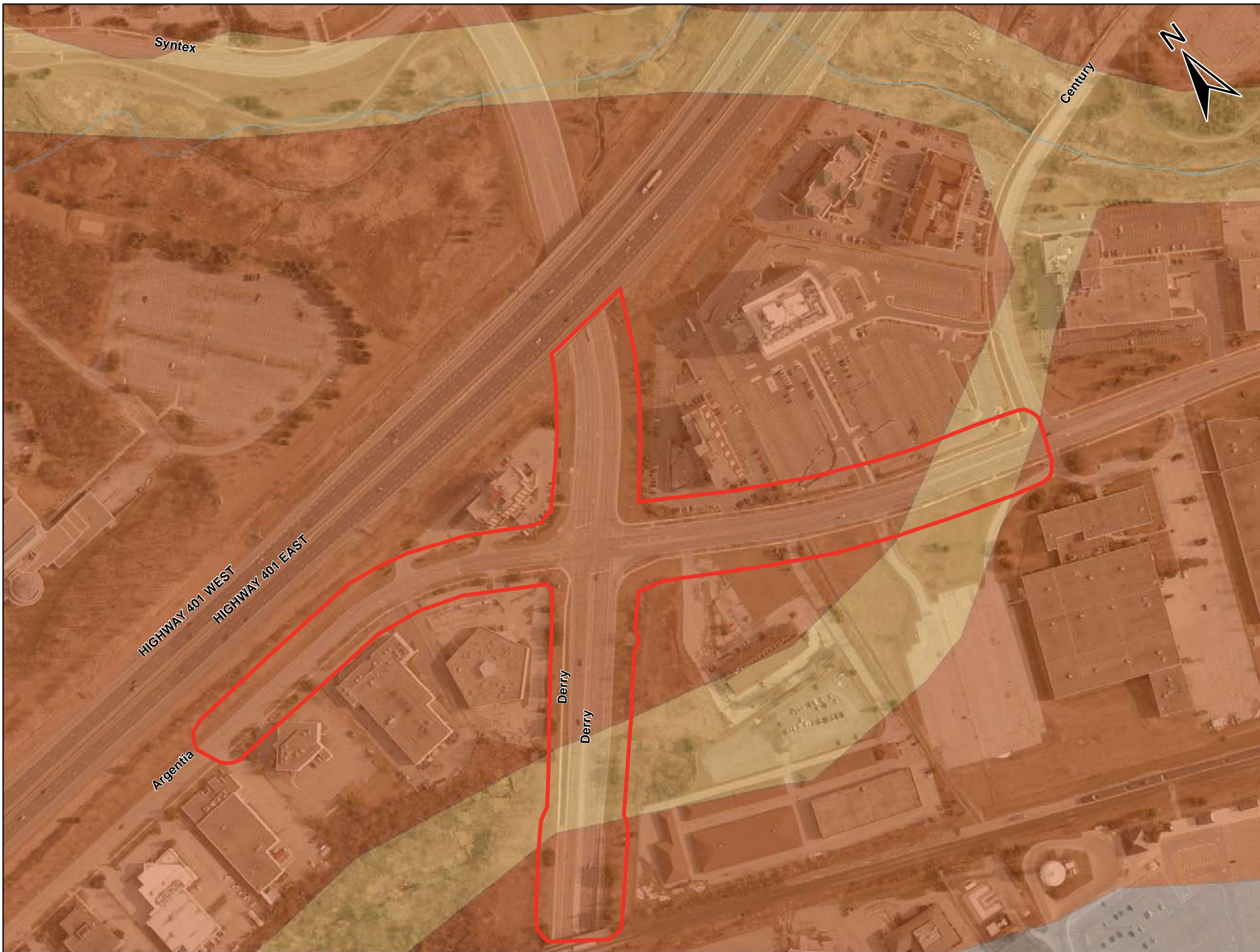





Figure 3: Study area (approximate location) overlaid on 1909 map of Brampton

Base map:
(Dept. of Militia and Defence 1909)

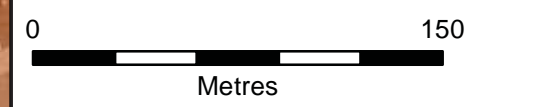


 Study Area

 Diamicton

 Sand

BASE: Datum/Projection - NAD83 UTM 17T
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 Ortho Imagery -



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 DATE: Oct 16 2013


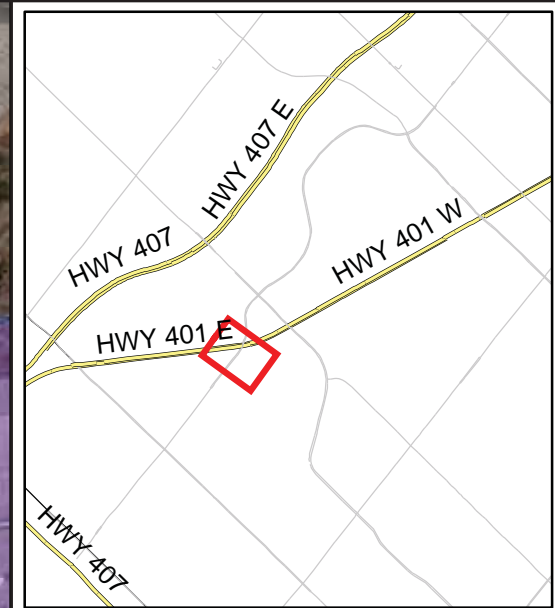
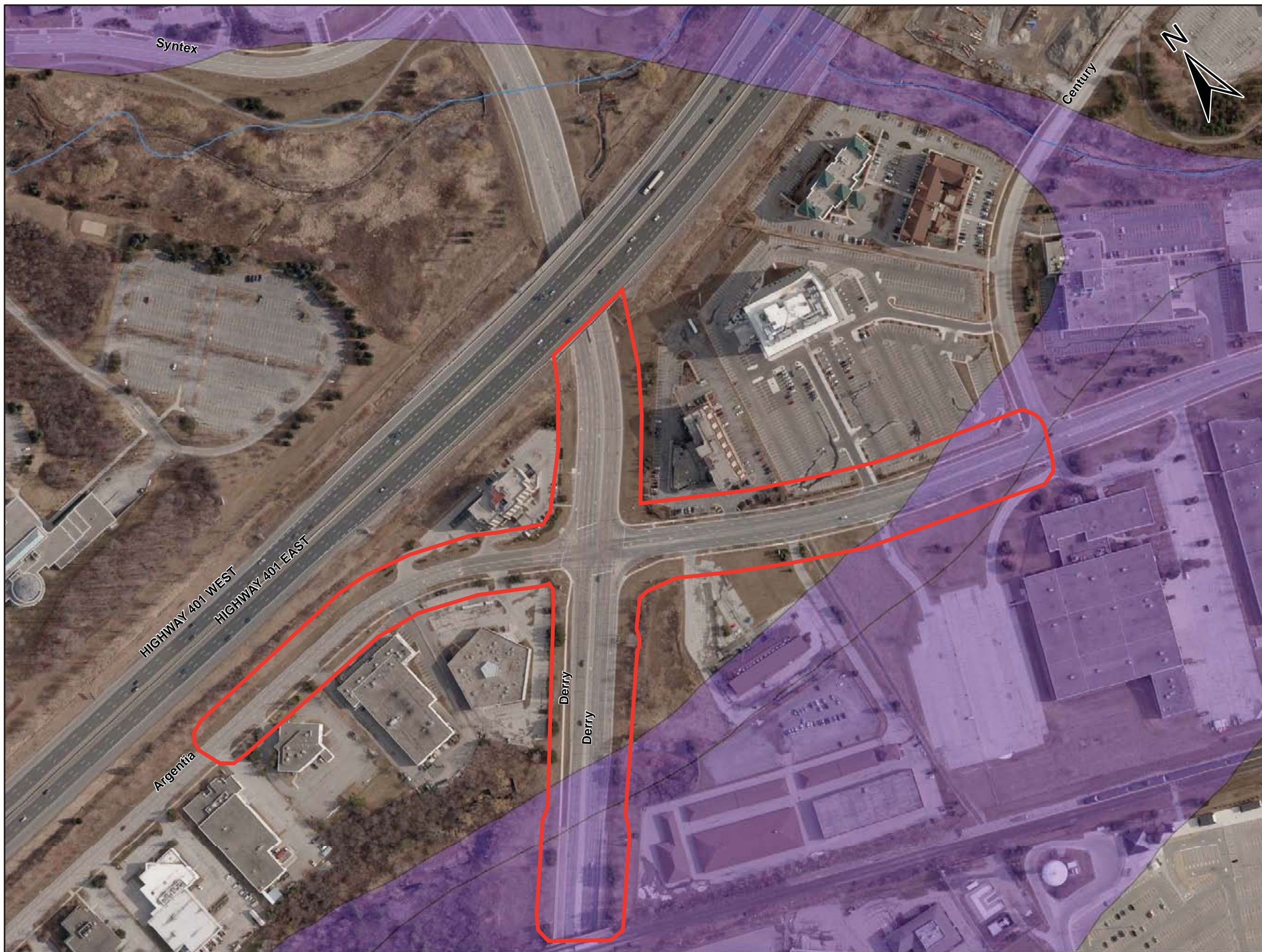
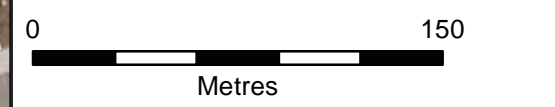
 **Archaeological Services Inc.**
 528 Bathurst St. T 416-966-1069
 Toronto, Ontario F 416-966-9723
 Canada, M5S 2P9 info@iASI.to/www.iAS±.to

Figure 4: Intersection of Derry Road and Argentia Road - Surficial Geology



- Study Area
- Poorly Drained

BASE: Datum/Projection - NAD83 UTM 17T
 Client data - Derry-Argentia 11-4295 3d.dgn
 11-4295 property.dwg
 Ortho Imagery -



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Figure 5: Intersection of Derry Road and Argentia Road - Soil Drainage

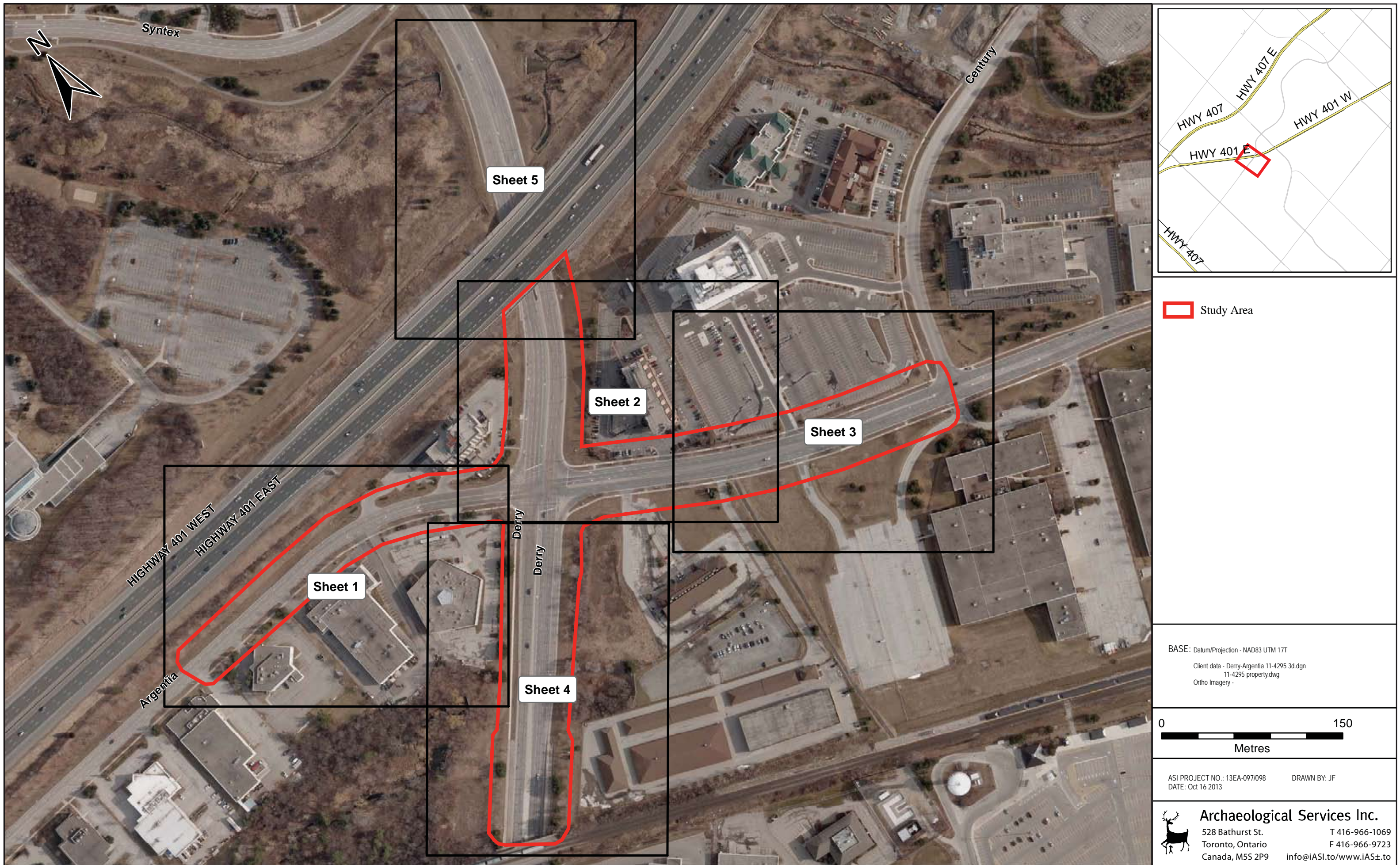


Figure 6: Intersection of Derry Road and Argentia Road - Property Inspection Results (Key Map)

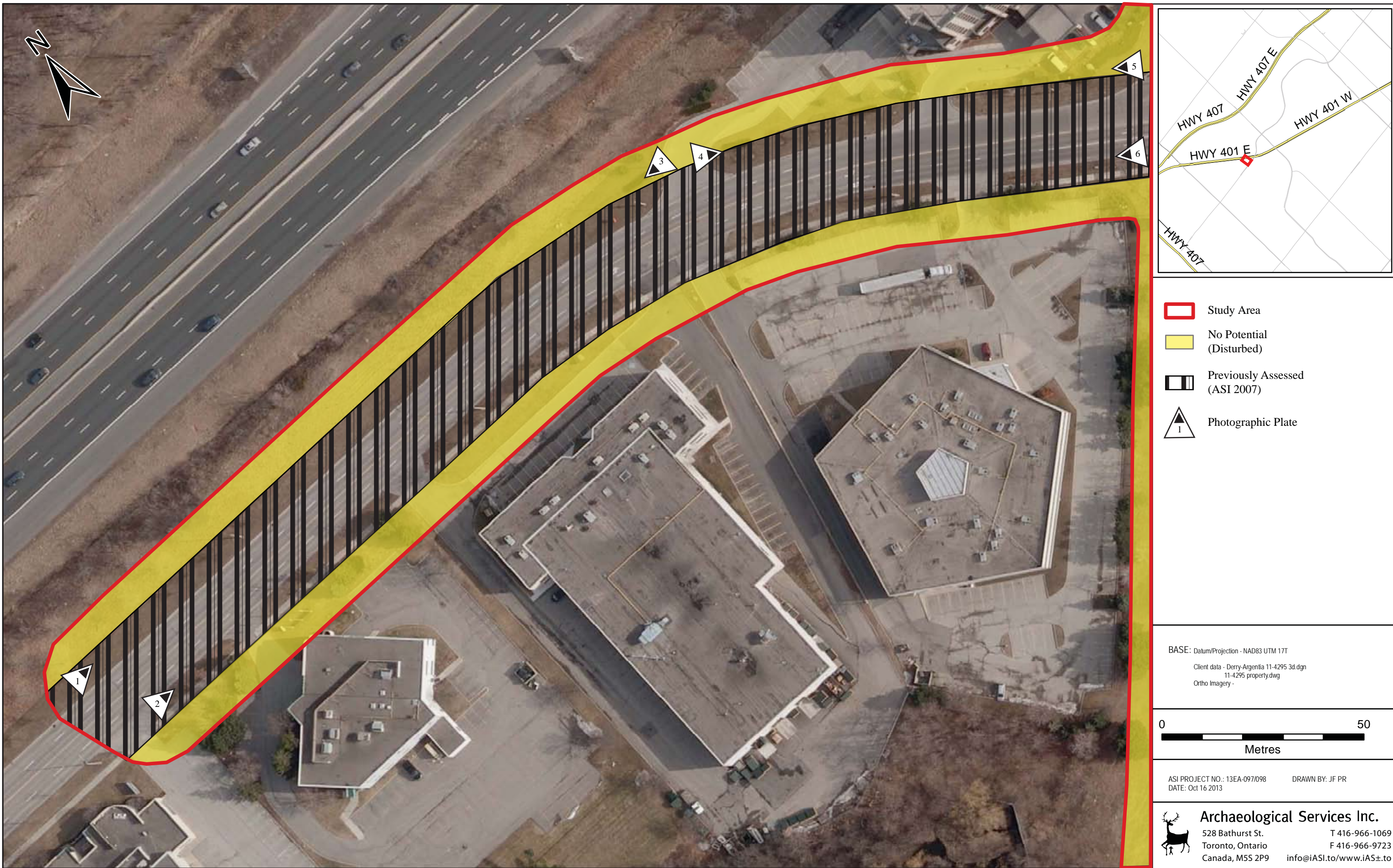
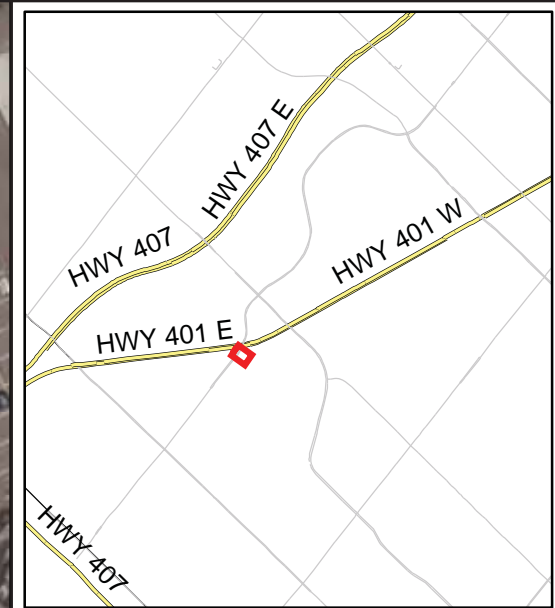
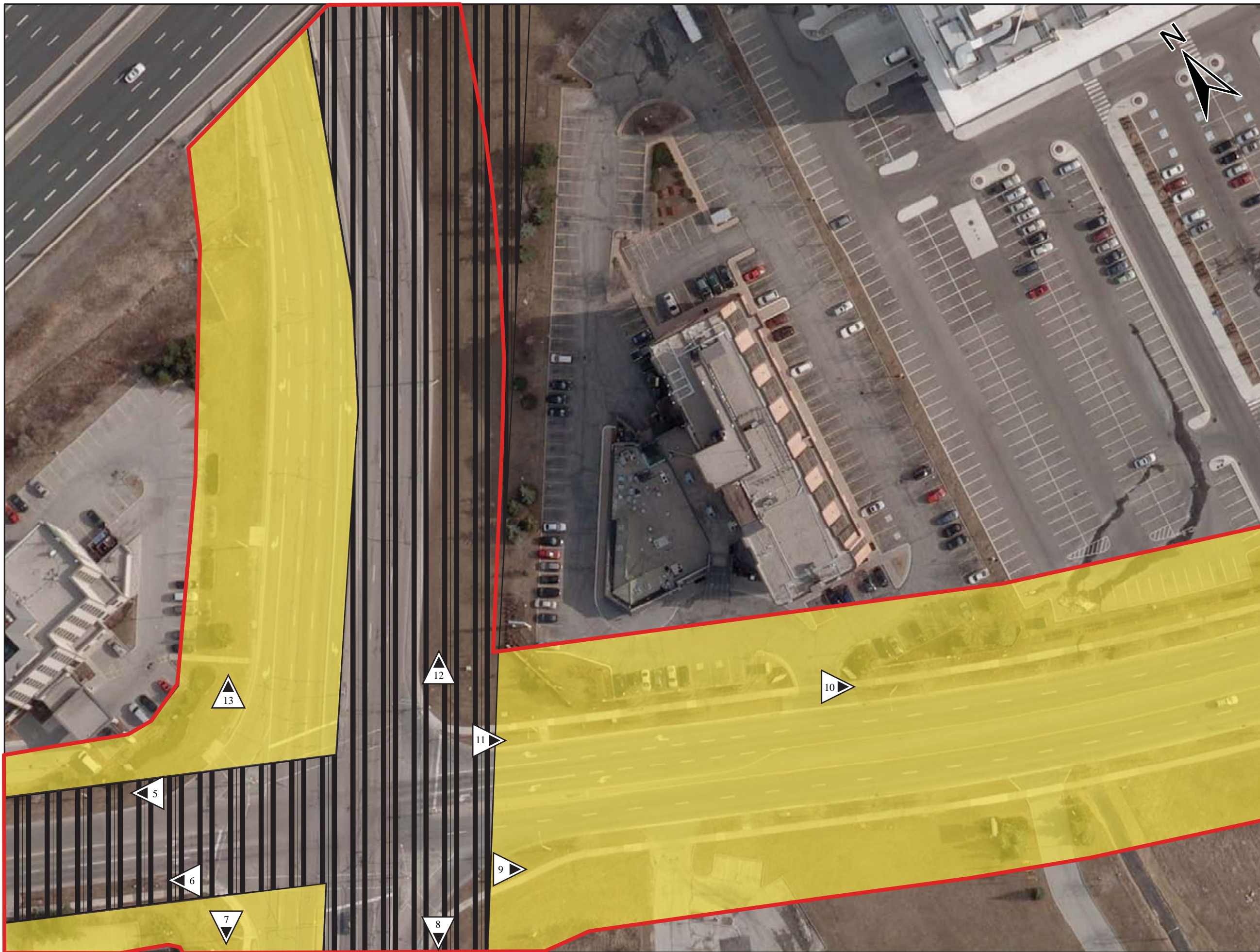


Figure 7: Intersection of Derry Road and Argentina Road - Property Inspection Results (Sheet 1)



- Study Area
- No Potential (Disturbed)
- Previously Assessed (ASI 2007)
- Photographic Plate

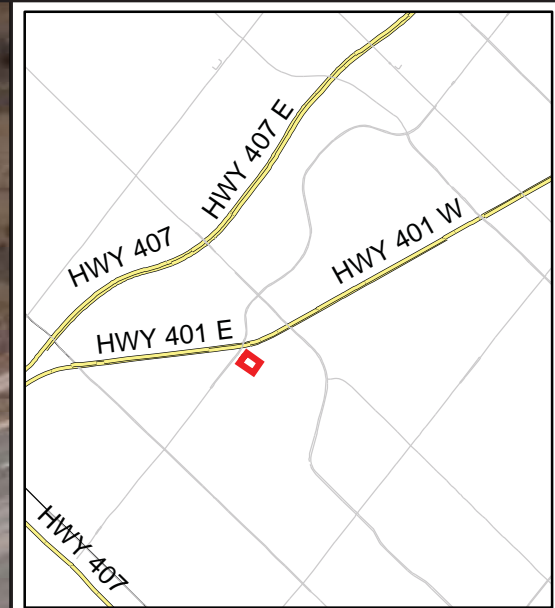
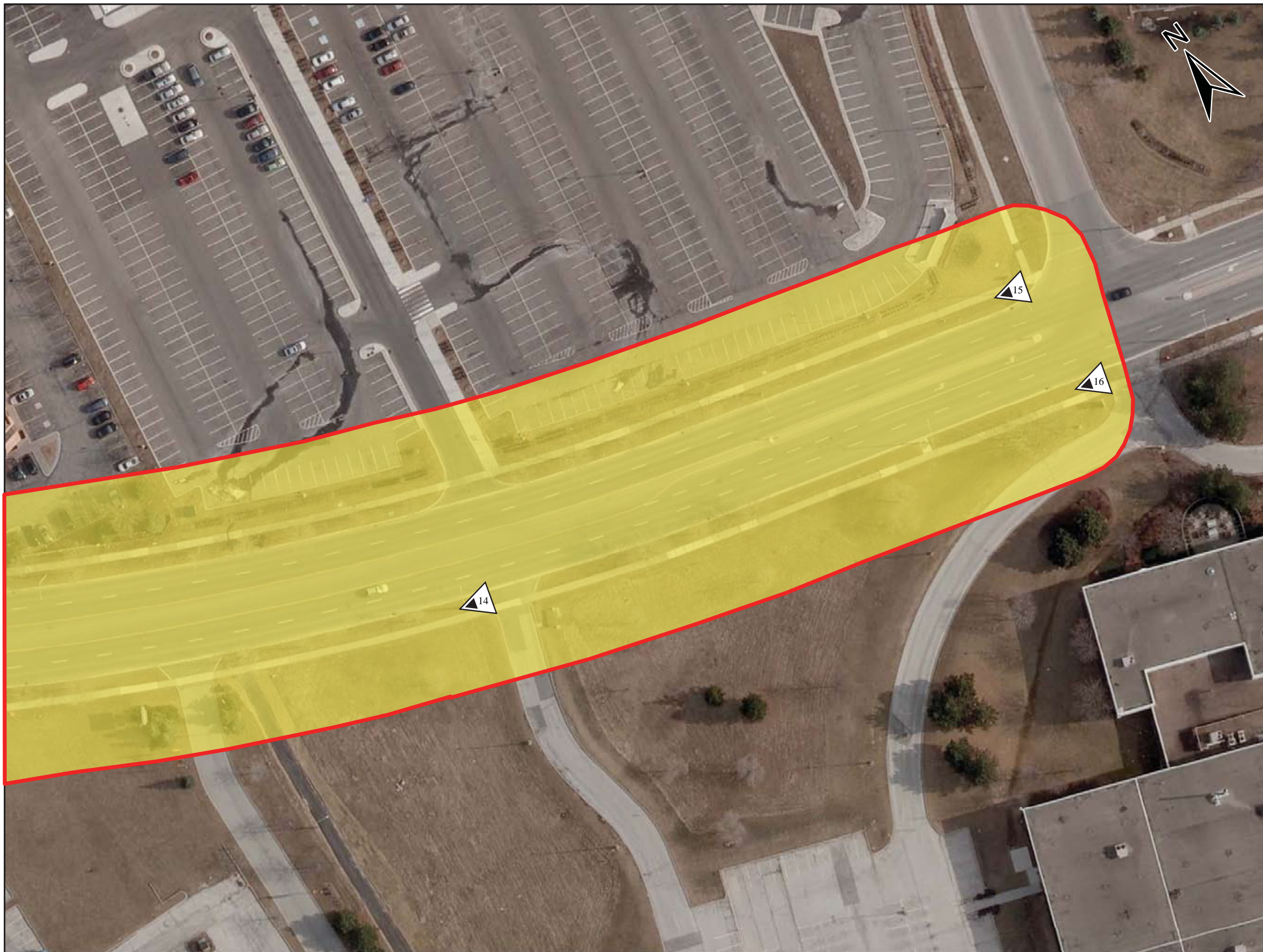
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 Client data - Derry-Argentia 11-4295 3d.dgn
 11-4295 property.dwg
 Ortho Imagery -



ASI PROJECT NO.: 13EA-097/098 DRAWN BY: JF PR
 DATE: Oct 4 2013

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Figure 8: Intersection of Derry Road and Argentia Road - Property Inspection Results (Sheet 2)



- Study Area
- No Potential (Disturbed)
- ▲
1 Photographic Plate

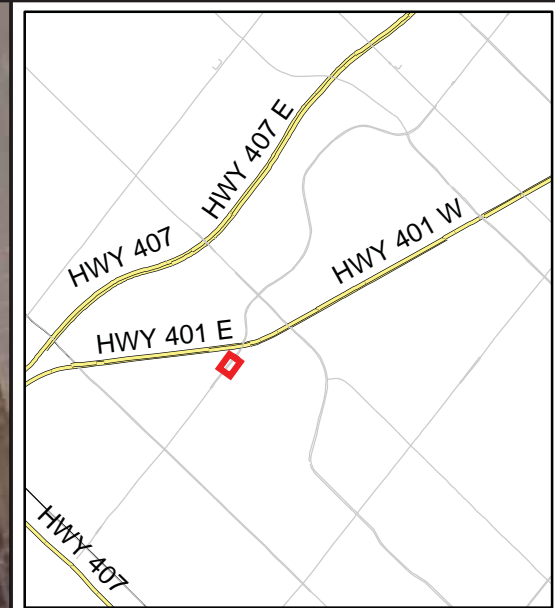
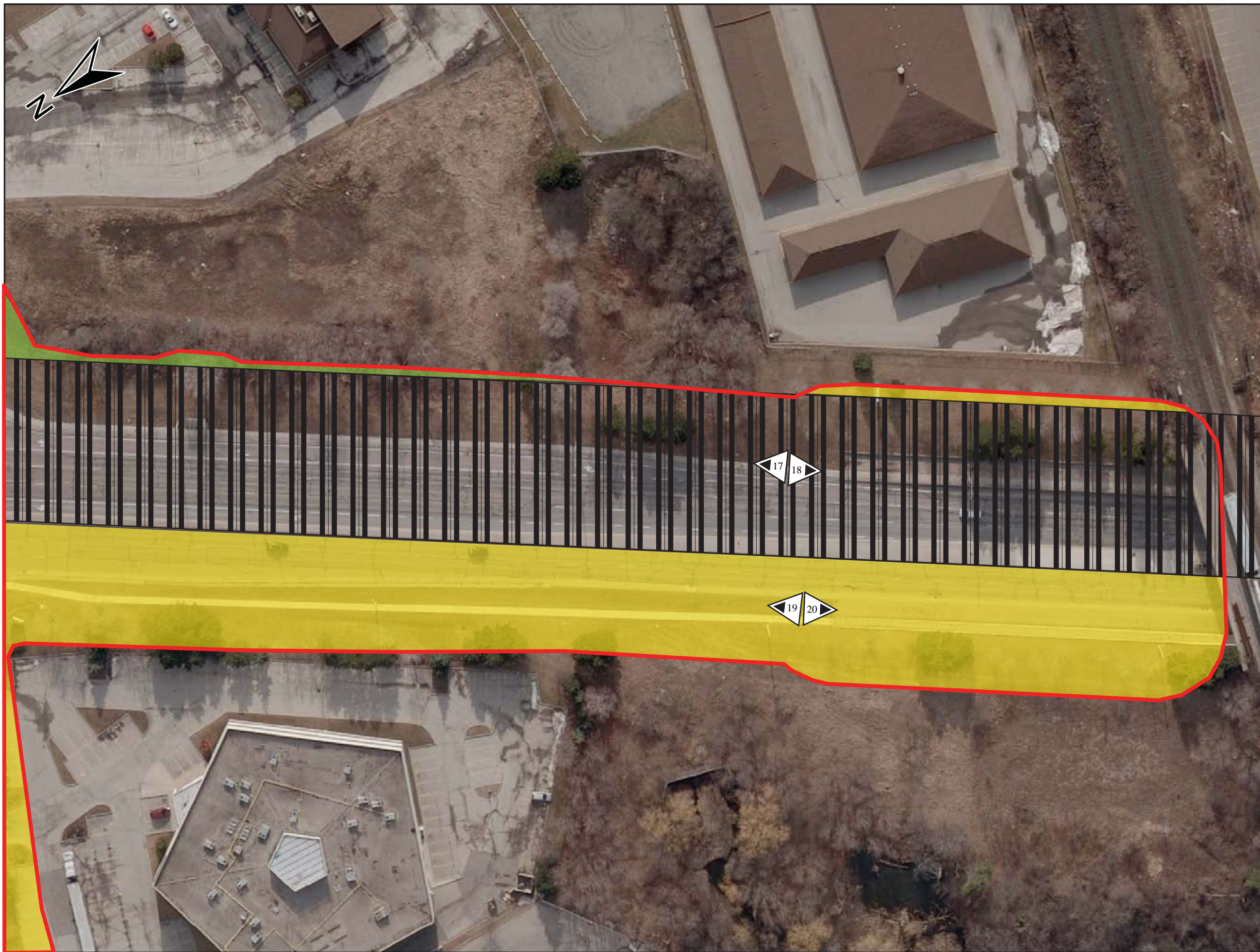
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 Client data - Derry-Argentia 11-4295 3d.dgn
 11-4295 property.dwg
 Ortho Imagery -








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 DATE: Oct 4 2013

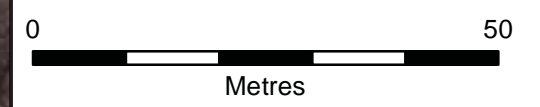
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Figure 9: Intersection of Derry Road and Argentia Road - Property Inspection Results (Sheet 3)



-  Study Area
-  No Potential (Disturbed)
-  Potential (Req. Stage 2 test-pit survey)
-  Previously Assessed (ASI 2007)
-  Photographic Plate

BASE: Datum/Projection - NAD83 UTM 17T
 Client data - Derry-Argentia 11-4295 3d.dgn
 11-4295 property.dwg
 Ortho Imagery -



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 DATE: Oct 16 2013


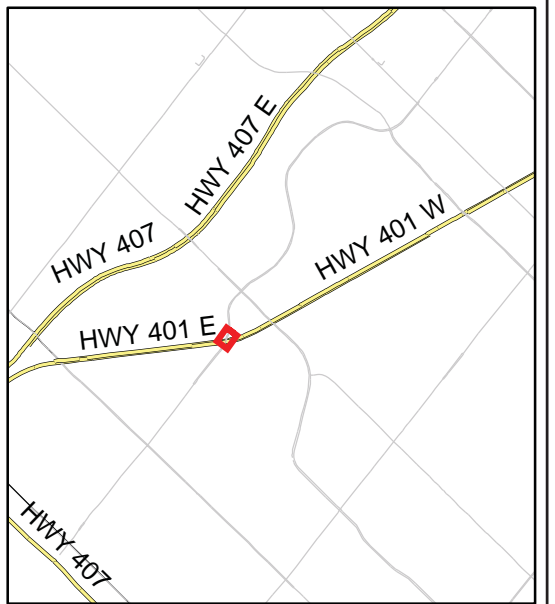
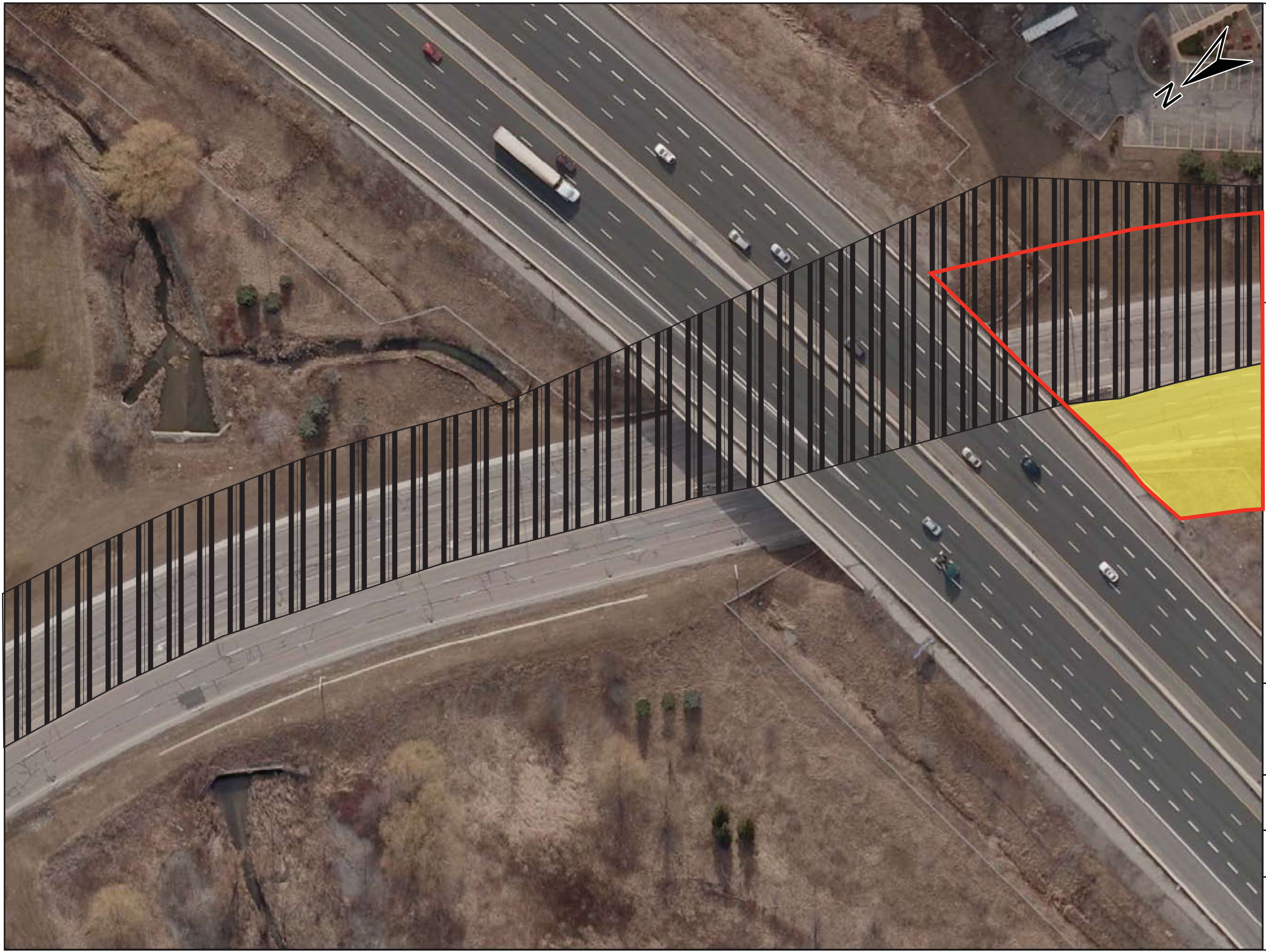



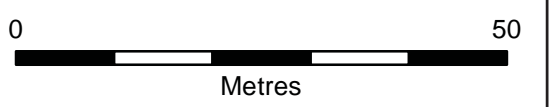
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Figure 10: Intersection of Derry Road and Argentia Road - Property Inspection Results (Sheet 4)




-  Study Area
-  No Potential (Disturbed)
-  Previously Assessed (ASI 2007)

BASE: Datum/Projection - NAD83 UTM 17T
 Client data - Derry-Argentina 11-4295 3d.dgn
 11-4295 property.dwg
 Ortho Imagery -



ASI PROJECT NO.: 13EA-097/098 DRAWN BY: JF PR
 DATE: Oct 4 2013



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Figure 11: Intersection of Derry Road and Argentina Road - Property Inspection Results (Sheet 5)

8.0 IMAGES



Plate 1: View east along Argentia Road. ROW is disturbed. No potential. Lands beyond the ROW are also disturbed. No potential.



Plate 2: View east along Argentia Road. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.



Plate 3: View west along Argentia Road. ROW is disturbed. No potential. Lands beyond the ROW are also disturbed. No potential.



Plate 4: View southeast along Argentia Road. ROW is disturbed. No potential. Lands beyond the ROW are also disturbed. No potential.



Plate 5: View northwest along Argentia Road. ROW is disturbed. No potential. Lands beyond the ROW are also disturbed. No potential.



Plate 6: View northwest along Argentia Road. ROW is disturbed. No potential. Lands beyond the ROW are also disturbed. No potential.





Plate 7: View southwest along Derry Road West. ROW is disturbed. No potential. Lands beyond the ROW are graded and disturbed. No potential.



Plate 8: View southwest along Derry Road West. ROW is disturbed. No potential. Lands beyond ROW have potential. Require Stage 2 test-pit survey.



Plate 9: View southeast along Argentia Road. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.

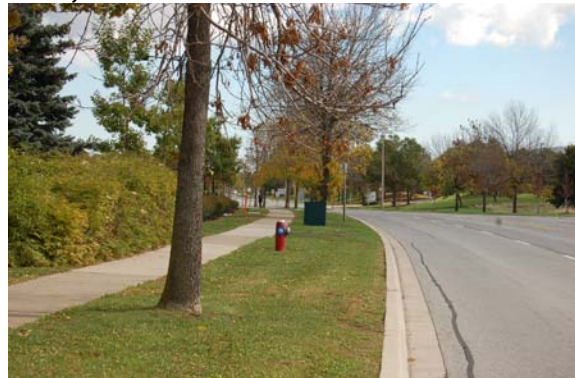


Plate 10: View southeast along Argentia Road. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.



Plate 11: View southeast along Argentia Road. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.



Plate 12: View northeast along Derry Road West. Paved ROW is disturbed. No potential.





Plate 13: View northeast along Derry Road West. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.



Plate 14: View northwest along Argentia Road. ROW is disturbed. No potential. Lawn is graded. No potential.



Plate 15: View northwest along Argentia Road. ROW is disturbed. No potential. Lands beyond Row are also disturbed. No potential.



Plate 16: View northwest along Argentia Road. ROW is disturbed. No potential. Lands beyond ROW area graded and disturbed. No potential.



Plate 17: View northeast along Derry Road West. ROW is disturbed. No potential. Lands beyond ROW have potential. Require Stage 2 test-pit survey.



Plate 18: View southwest along Derry Road West. ROW is disturbed. No potential. Lands beyond ROW are also disturbed. No potential.





Plate 19: View northeast along Derry Road West. ROW is disturbed. No potential.



Plate 20: View southwest along Derry Road West. ROW is disturbed. No potential.

