

## Annex V

### Archaeological Assessments

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*Woodland Heritage*
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*Woodland Heritage*

**SUMMARY REPORT**  
**Stage 1 Archaeological Impact Assessment of**  
**Proposed Big Eddy, Petawawa River**  
**Hydroelectric Project, Fit-7PCDC,**  
**Township of Petawawa, Renfrew County**

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PO65-2010 (Woodland Heritage Services Limited)

**Project Information:**  
Big Eddy - Petawawa River  
Township of Petawawa  
Renfrew County

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## **EXECUTIVE SUMMARY**

Xeneca Power Development Inc of North York, Ontario retained Woodland Heritage Services Limited to conduct a Stage 1 archaeological assessment of a proposed hydropower development at Big Eddy, Petawawa River, Petawawa Township, Renfrew County, Ontario.

A Stage 1 archaeological assessment was conducted for this project.

Areas of high archaeological potential were identified within the study area. It is recommended that these areas be subjected to Stage 2 archaeological assessment as outlined in the Stage 1 recommendations.

Should anything of historical or cultural value be discovered, or human remains found, appropriate measures should be taken.

## **1.0 PROJECT PERSONNEL**

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## **2.0 PROJECT BACKGROUND**

### **2.1 Development Context**

Xeneca Power Development Inc of North York, Ontario retained Woodland Heritage Services Limited to conduct a Stage 1 archaeological assessment of a proposed hydropower development at Big Eddy, Petawawa River, Petawawa Township, Renfrew County, Ontario (Figures 1-4).

### **2.2 Historical Context**

#### *2.2.1 Record Review*

Site files at the offices of the Archaeological Data Coordinator Ministry of Culture (MTC) and Woodland Heritage Services Limited site files were checked to determine if any prehistoric sites had been previously recorded and registered either in or near the study area.

#### *2.2.2 Known/Registered Archaeological Sites*

The registered site database maintained by the Ontario Ministry of Culture (MTC) (Mr. Robert Von Bitter, Site Database Coordinator) was queried for information for sites in and near the study area. There are no registered archaeological sites in or near the project area.

#### *2.2.3 Cultural Prehistory*

People have been living in the study area since the time glaciers receded and the land could support plants and animals. Archaeologists have divided the precontact era (that is, before the time of European arrival) into time periods, described briefly below.

#### *2.2.4 Paleo-Indian Period (ca. 10,000 - 7000 B.P. [before present time])*

These precontact peoples were the first inhabitants of the area. Most likely, they arrived by following herds of caribou across the tundra/parkland environment of newly opened lands left by the retreating glaciers. Within a few hundred years, the Boreal forest moved in, causing an adaptation to a forest environment and settlement concentrations along lakes and river systems. Several types of early spear points indicate that different groups of these early hunters moved in at various times.

However, because of the later retreat of the glaciers in the northern part of the province and subsequent flooding of the glacially-compressed landscape by pre and post glacial lakes, there was a time delay in the settlement of northern regions by colonizing vegetation, animals and humans. It appears that people may have entered the eastern Lake Superior/northern Lake Huron area about 9,000 years ago, while archaeological work farther north in the Hudson's Bay Lowlands suggests that human occupation there may be limited to about the last 6,000 years.

### *2.2.5 Archaic Period (ca. 7000 B.P. - 2500 B.P.)*

An environmental transition brought about warmer, drier conditions resulting in a change in the plant and animal communities, which consequently impacted the subsistence patterns of humans living in the region now represented by north-central Ontario. These alterations of subsistence patterns are reflected in the artifact assemblages. For instance, in response to the hunting of smaller game, large spear points were replaced by smaller, notched projectile points and stone knives generally became smaller. A new technology involving the production of stone tools by grinding rather than chipping was also utilized.

About 3,000 B.C., people started to make use of copper, which was cold-hammered to form spear points, knives, gaff hooks and elaborate jewelry. One of the most complete copper assemblages for northwestern Ontario comes from a burial south of Lake Nipigon, dating to about 1,500 B.C.

### *2.2.6 Woodland Period (ca. 2500 B.P. - 400 B.P.)*

The Early Woodland Period marks the first appearance of ceramics in the archaeological record, a technological development which becomes increasingly important to the archaeologist as a means of determining the age and occupation of a site. Just as projectile points in the preceding Archaic and Paleo stages underwent stylistic alterations through time, which permitted the determination of the age of a site, ceramics also reflect changes: in vessel form, method of construction, decorative motif (design) and mode of decoration (method). The evolution of ceramic construction was gradual and subtle enough to allow archaeologists to determine the placement of a site within a cultural chronology on the basis of the ceramics recovered from it.

The earliest cultural manifestation at this time is called the Meadowood culture. It is typified by more elaborate artifact forms and grave offerings.

The Meadowood culture is succeeded by the Point Peninsula culture in southern Ontario. Point Peninsula peoples continued the trend towards more elaborate grave offerings, as well as increasingly elaborate pottery decoration which combined Hopewell culture influences from the south (its heartland was in the Ohio and Illinois Valleys of the Central US) with pottery designs that were uniquely their own.

The final period in Ontario's prehistory is known as the Terminal Woodland. It ends with the first historical accounts of the region, which commence about the beginning of the 17th century with the arrival of fur-traders and explorers. At this time, a number of Algonquin bands occupied the Ottawa River Valley. Although these nomadic bands essentially continued the hunter-gatherer subsistence patterns of preceding periods, their culture shows influences from the semi-sedentary horticulturalist peoples to the south and west. These influences included pottery styles and the introduction of corn, beans, and squash to supplement the diet.

### *2.2.8 Historic Period (ca. 400 B.P. to present)*

This period begins with the arrival of Europeans and settlers to the area, specifically French, then English traders, bringing with them trade goods such as axes, guns, beads and metal products.

### *2.2.9 Petawawa*

The Township of Petawawa was incorporated in 1865, and the Village of Petawawa was incorporated in 1961. On July 1, 1997, the Village and the Township amalgamated to become the Town of Petawawa with a population today of over 15,000, the largest municipality in Renfrew County. The earliest settlement recorded in Petawawa was by the group of Algonkin Indians known as "people of the great river". Roughly translated from the Algonkin language, Petawawa means "where one hears the noise of the water". During those early times the location was ideal for access throughout the region on the Ottawa and Petawawa Rivers for both the gathering for social assemblies and for the transportation of trade goods.

Early European visitors included Samuel de Champlain who visited in 1613 during his first voyage to Huron country. Later French fur traders used the trails along the Petawawa River as part of their trade route. Some of these trails still exist on CFB Petawawa today.

The Hudson Bay Company designated the area as a "strategic location" and established Fort William in 1823 on the Quebec side of the Ottawa River opposite CFB Petawawa. Three years later in 1826, the Ottawa River was viewed as an alternate shipping route to the Great Lakes in case the United States was successful in closing the upper St. Lawrence River. The first survey for Petawawa Township was in 1857 united with Rolph, Buchanan, Wylie and McKay and Alice Townships in 1858 before finally separating on its own in 1865.

The first European settlers came from Scotland and Ireland followed some years later around 1885 by German homesteaders. Settlers found the land to be uncooperative for farming but the timber was valuable and created jobs and economic opportunities from those times to these. In 1905, the Canadian military acquired land in the area which has now been developed into Canadian Forces Base Petawawa, currently one of Canada's largest military bases. The base is now an integral part of the town.

## **2.3 Archaeological Context**

There are no previous archaeological studies on record for the project area. It is important to note, however, that the lack of archaeological studies does not indicate or suggest that there is no archaeological or cultural heritage potential within the project area. Rather, it should be interpreted to mean simply that no archaeologist has conducted a study in this area.

The Petawawa River at the project location is relatively undeveloped and in its natural state. The overstory in the general project area is typical of that encountered in the



Ottawa Valley. A pine overstory is dominated by white and red pines with an understory of shade tolerant woody shrubs. Deciduous hardwoods such as maples and oaks are also found throughout the area. Soils are well developed and humic rich.

At the location of the proposed dam, the Petawawa River sweeps widely through large bends. An existing railway crosses the Petawawa River at the rapids with a bridge. A roadway, now closed also crosses through the study area with a bridge that crosses the river approximately 50m downstream from the railway bridge. There are no houses or other developments within the project area.

### **3.0 PROPERTY INSPECTION**

#### **3.1 Determination of Areas Surveyed**

The client provided detailed survey maps identifying the boundaries of the project area. In association with satellite and air photo imagery of the project area, high potential areas were determined using the Ministry of Tourism and Culture checklist for determining high potential.

### **4.0 ANALYSIS AND CONCLUSIONS**

The area under investigation for development is identified on Figures 1-4. An analysis of the subject project area was undertaken using high resolution aerial imagery, detailed topographic maps prepared by Hatch Energy from LIDAR data, topographic maps and other records. There are no archaeological sites within or near the project area.

At this location, Xeneca Power Development Inc. proposes to construct a spillway dam, an intake and power channel, a powerhouse and (if necessary) an earth-fill embankment to provide protection to the railway line. A headpond extending approximately 2300m in length will be created.

According to MTC's own checklist for determining archaeological potential, areas in northern Ontario within 150m of a major water source are considered to have high cultural heritage potential.

The location of the proposed dam at Big Eddy on the Petawawa River has high archaeological potential due to its proximity to a major water source (Petawawa River) and the existence of rapids. In the past, rapids would certainly have required river travellers to go around the rapids by means of a portage. It is reasonable to assume that a portage trail exists at this location on one or both sides of the river.

The wide, low floodplain also suggests high archaeological potential due to the existence of low, flat relatively well drained land immediately adjacent to a major water source.

It is also proposed that roads will be constructed to access the proposed damsite, although new road construction will be limited in scope due to the existing transportation networks already in existence in the immediate area.

Finally, it is proposed that new transmission corridors and lines be constructed to transport power from the proposed damsite to the main electric transmission line.

## **5.0 RECOMMENDATIONS**

It is recommended that Stage 2 archaeological assessments take place at the location of the proposed Big Eddy hydroelectric development on the Petawawa River.

Specifically, it is recommended that Stage 2 assessments take place at the location of the damsites, powerhouse and spillways.

An approximately 2.3km long headpond will be created by the proposed development. There are areas of high archaeological potential within areas proposed to be inundated. These areas should be subject to Stage 2 assessments.

It is also recommended that once the final location of new access roads, new transmission corridors and any areas that will be newly disturbed as a result of the construction of the damsite (e.g., laydown areas, borrow pits, fill areas etc) that those areas be subjected to Stage 2 assessment if they are determined to have high archaeological potential.

## **6.0 ADVICE ON COMPLIANCE WITH LEGISLATION**

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

6.2 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.

6.3 The Cemeteries Act requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries, Ministry of Small Business and Consumer Services.

## 7.0 FIGURES

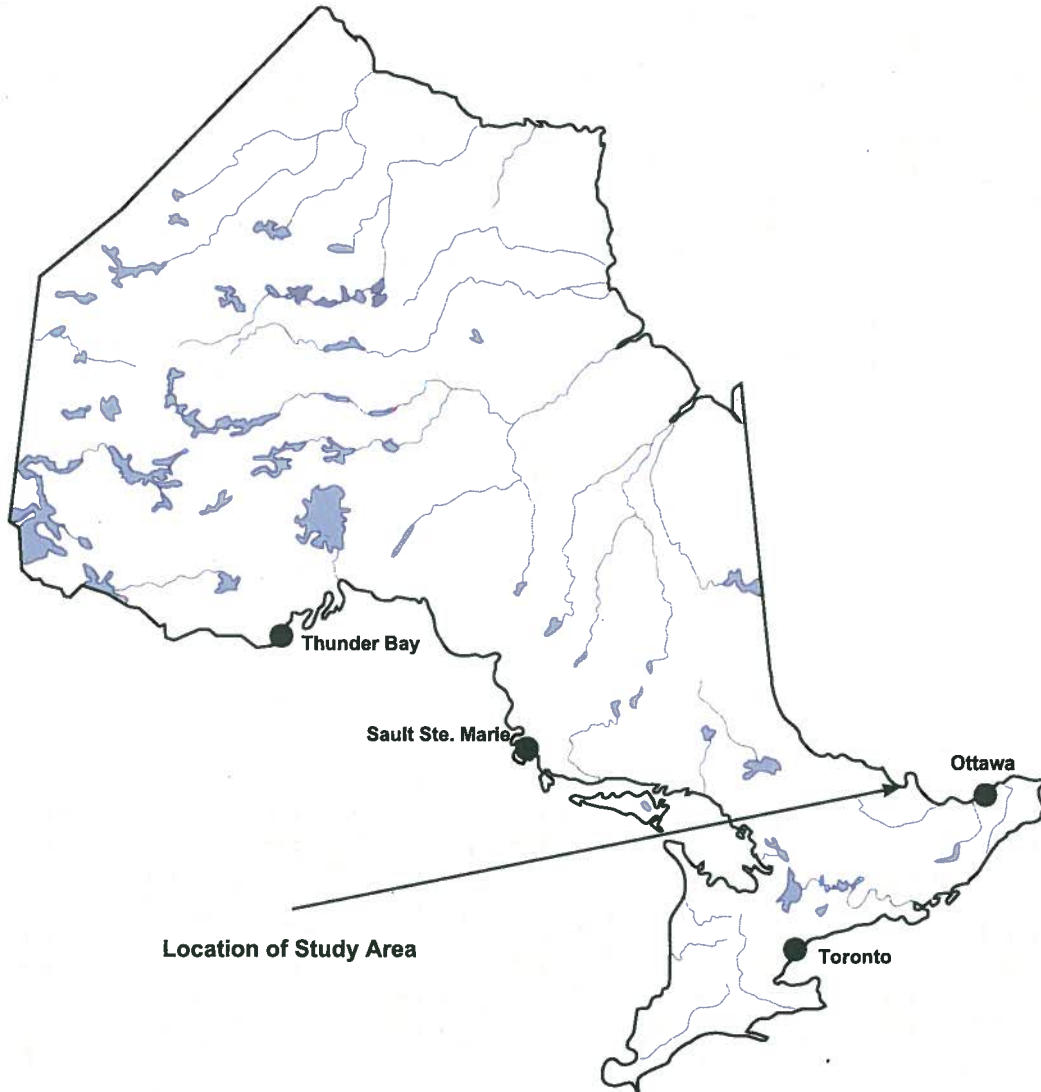


Figure 1. Key map illustrating the location of the Big Eddy Hydropower Development on the Petawawa River, Ontario.

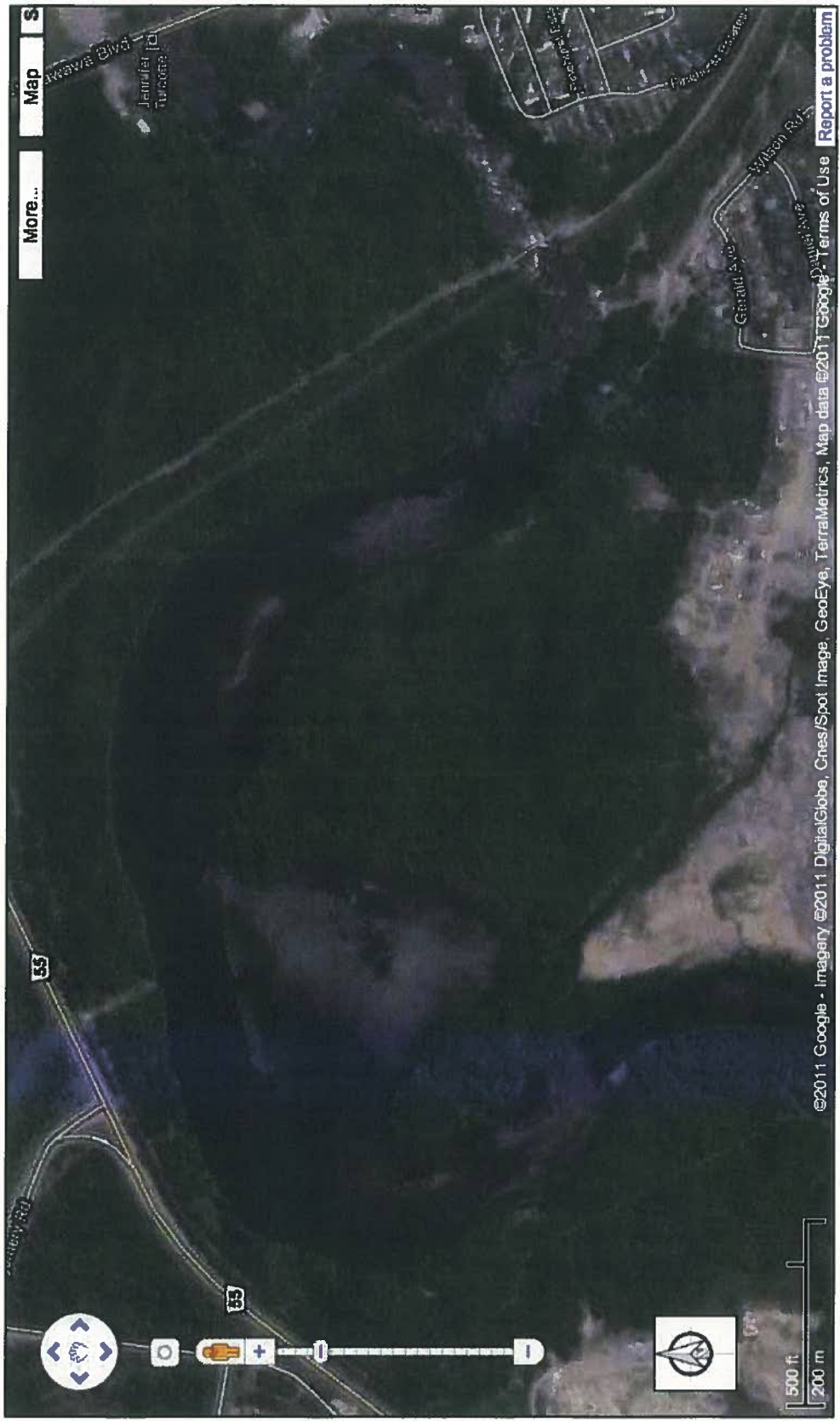


Figure 2. Satellite image illustrating the location of the Big Eddy Hydropower Development on the Petawawa River, in the Township of Petawawa in Renfrew County.



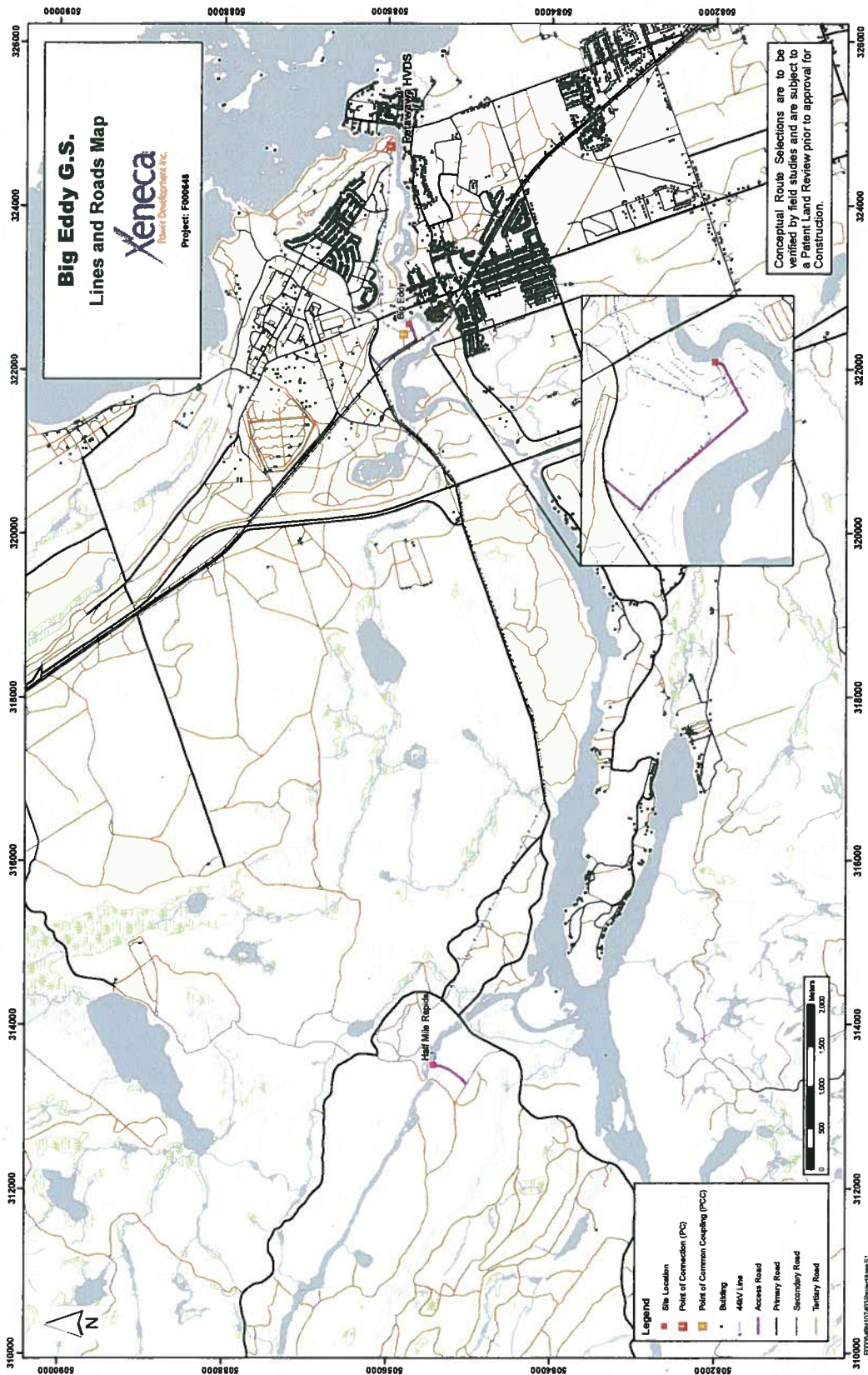


Figure 3. Location of the Big Eddy Hydropower Development on the Petawawa River, in the Township of Petawawa in Renfrew County.

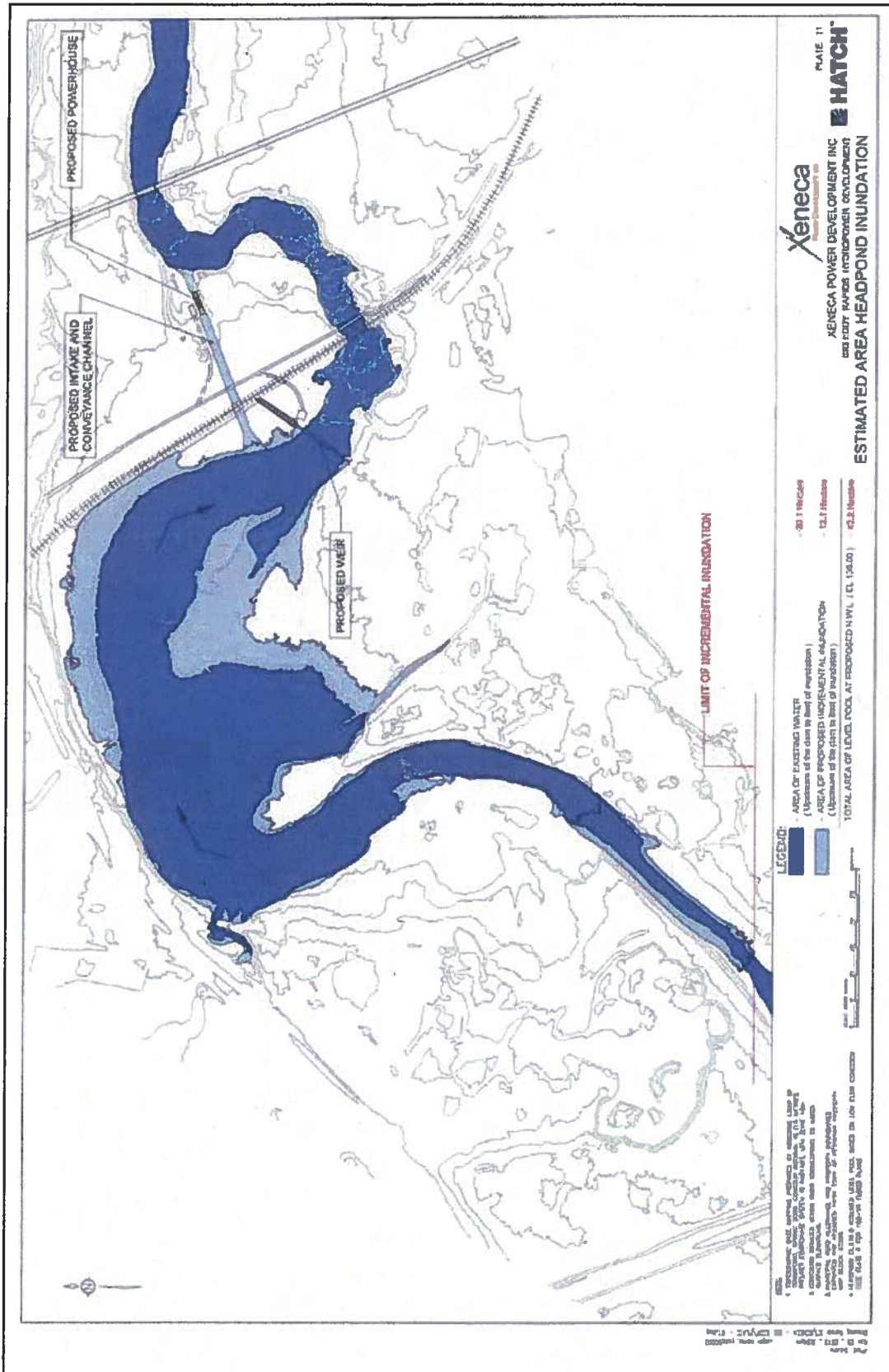


Figure 4. Development map of the proposed hydropower facility at Big Eddy Hydropower Development on the Petawawa River, in the Township of Petawawa in Renfrew County. Contour intervals are 50cm.

**Stage 2 Archaeological Impact Assessment of  
Proposed Big Eddy, Petawawa River  
Hydroelectric Project, Fit-7PCDC,  
Township of Petawawa, Renfrew County**

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**Project Information:**

P065-159-2011 continued from P065-148-2010

Big Eddy - Petawawa River

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December 28, 2012



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## **EXECUTIVE SUMMARY**

Xeneca Power Development Inc of North York, Ontario retained Woodland Heritage Services Limited to conduct a Stage 2 archaeological assessment of a proposed hydropower development at Big Eddy Rapids, Petawawa River in Renfrew County, on the property of CFB Petawawa and the City of Petawawa, Ontario.

A Stage 2 archaeological assessment of this project was conducted by Woodland Heritage Services Limited under PIF #P065-159-2011 continued from P065-148-2010.

As a result of the assessment, no cultural resources were identified.

It is recommended that no further archaeological assessment work is required at the proposed hydro power project at Big Eddy Rapids on the Petawawa River.

## **1.0 PROJECT PERSONNEL**

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## 2.0 PROJECT BACKGROUND

### 2.1 Development Context

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A Stage 2 archaeological assessment of this project was conducted by Woodland Heritage Services Limited under PIF #P065-159-2011 continued from P065-148-2010.

### 2.2 Archaeological Context

There are no previous archaeological studies on record for the project area. It is important to note, however, that the lack of archaeological studies does not indicate or suggest that there are no archaeological sites to be found within the project area. Rather, it should be interpreted to mean simply that no archaeologist has conducted a study in this area.

The Petawawa River flows southeasterly from Algonquin Park to its mouth on the Ottawa River at Petawawa. At the project location, the river flows through CFB Petawawa (on its northern shore), a military base that has been in use since the early decades of the last century. While the river remains, for the most part, in a wild state through the base, several bridges have been built spanning the river. In addition, the base's role as an artillery range means that the river has been impacted by a century of military activities. On the southern shore, development within the City of Petawawa has resulted in extensive impacts to the shoreline. A gravel pit, subdivision developments, a natural gas pipelines, roads and a railway have all contributed to impacts.

The overstory in the general project area is typical Great Lakes/St. Lawrence forest with large white pines, spruces, and hardwoods. Soils are glaciolacustrine sands. The Petawawa River flows through a bedrock-controlled valley with steep/high bedrock walls in places. At the location of the proposed dam, the river drops quickly over rapids through an "S" bend in the river. An abandoned railway bridge spans the river just downstream from the proposed damsite. The weir proposes to raise the level of the river to regulate flow through a power canal.

It is important to note that permission was granted by CFB Petawawa to conduct archaeology survey activities on the north shore of the river. Because the project area is located on an active artillery range, it was *mandatory* that *all* of our archaeology activities on the north shore of the river were coordinated with an Unexploded Ordnance (UXO) Technician. The UXO tech examined every path we walked and every test pit we excavated *before* we did so, to ensure that we didn't get blown up. I am pleased to report that no crew members were blown up.

### **3.0 PROPERTY INSPECTION**

#### **3.1 Determination of Areas Surveyed**

Detailed maps and survey plans identifying the project limits were provided by the proponent to the archaeologists. It was relatively easy to determine the project area as the geography of the river and features such as natural gas pipelines, railway bridges and gravel pits all uniquely assisted in confirming our location within the project.

Access to the study area was granted by CFB Petawawa and the client.

The area was visited for a Stage 2 site assessment Sept. 30-Oct. 1, Oct. 18, 2012. The weather conditions during the survey were ideal for Stage 2 work.

### **4.0 ANALYSIS AND CONCLUSIONS**

#### **4.1 Field Methods**

The area under investigation for development is identified on Figures 1 and 2.

There are no registered archaeological sites within the study area.

Areas of high potential were identified in the Stage 1 report (PIF# P065-113-2010). These areas were subjected to archaeological test pitting as required by MTCS 2011 Guidelines. In total, 2 areas of high potential were investigated (Figure 3); one on the southern side of the river, and one on the northern side of the river. In all cases, archaeological test pits were excavated on a 5m grid within 50m of a shoreline and on a 10m grid where the area of high potential extended between 50m and 150m from the shoreline.

All test pits proved negative and no evidence for archaeological resources was identified.

It is important to note that in the process of excavating test pits and in accessing areas requiring test pitting, we made numerous observations of the features of the landscape and were constantly on the lookout for archaeological resources and cultural features that may not have been accounted for in the Stage 1 assessment. We did not find any.

#### **High Potential Area A**

This area is located upon the south side of the river. We surveyed from the natural gas pipeline crossing to the proposed weir. For the most part, the shoreline is heavily disturbed. We examined the pipeline crossing because at an open house in Petawawa, I was approached by a man who reported that as a kid, he found 'arrowheads' at the crossing. He was not more specific than that.

The pipeline crossing is a typical natural gas pipeline crossing that I have encountered many times in the past. The soils in the area are completely impacted and redeposited, and any material at that location is clearly not in a primary context. While I don't doubt that the gentleman found an arrowhead(s) at or near this spot when he was a kid, what is in doubt is where the primary context of that arrowhead was located. It is possible that the artifact was washed downstream with seasonal flooding/ice movement. It is also possible that the artifact was introduced to the location during the building of the pipeline and came from an entirely different location. It is also possible that the gentleman found something that looked like an arrowhead but was not. Whatever the case, the physical location around the pipeline crossing is so thoroughly disturbed that the likelihood that any site exists there now is remote, at best.

The areas identified as having high potential on the south side of the river can be characterized in three ways. The first includes those areas that are flooded during periods of higher water flow. These areas are characterized by washed cobbles and/or wet littoral zones without trees or bushes. The second includes areas that are reasonably dry but have seen impacts over the years - apparently from topsoil/gravel clearing activities before the 1970s. This conclusion is reached because the terrain exhibits a peculiar flatness; an absence of rich humic soils which one would expect alongside a river and all the trees are more or less the same age (about 30-40 years old). Road/trail cuts are also in evidence supporting the conclusion that at some point, vehicles were driven to this part of the river. Evidence for camping, tenting, hunting and fishing activities are also evident as is evidence for bush parties and/or activities perhaps associated with older military exercises (trenching, pits etc). In short, the south bank of the river from the sand/gravel pit to the railway bridge shows extensive evidence for having been well used and impacted for at least the last 100 years.

That being said, there were still some areas that appeared to have received relatively low impacts and in those areas, test pits were excavated as required. No cultural material was found.

### **High Potential Area B**

This area is located on the north side of the river between the railway embankment and the river. This area is heavily impacted and was likely heavily modified/impacted in the past. Evidence for this lies in the fact that there is very virtually no rich humic soil as one would expect on a flat piece of land immediately beside a river. In addition, virtually all the trees are approximately the same age (approximately 40-50 years). Further evidence for impacts lies in a road bed, piles of rocks/cobbles, trenches, pits, and foxholes.

Test pits were excavated throughout this area. No cultural material was found.

### **High Potential Area C**

This area is proposed to have part of the power canal go through it. It is located on the downstream side of the railway embankment and cuts through a park. The land in this area is heavily wooded with mature trees - a stark contrast to the opposite side of the railway embankment. The terrain is rough, rocky and drops sharply towards the Ottawa River. I walked throughout this area looking for any evidence of a portage trail and could not find any. There are numerous walking trails but nothing that stood out to me as being a portage trail. If a trail did exist in this location (and common sense suggests this to be the correct side of the river for a portage trail), evidence for the trail vanished long ago.

#### **4.2 Record of Finds**

No artifacts were recovered and therefore, no Record of Finds was created.

#### **5.0 RECOMMENDATIONS**

It is recommended that no further archaeological assessment work is required at the proposed hydro power project at Big Eddy Rapids on the Petawawa River.

#### **6.0 ADVICE ON COMPLIANCE WITH 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*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

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

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease

alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

*The Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

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



## 7.0 FIGURES AND PHOTOS

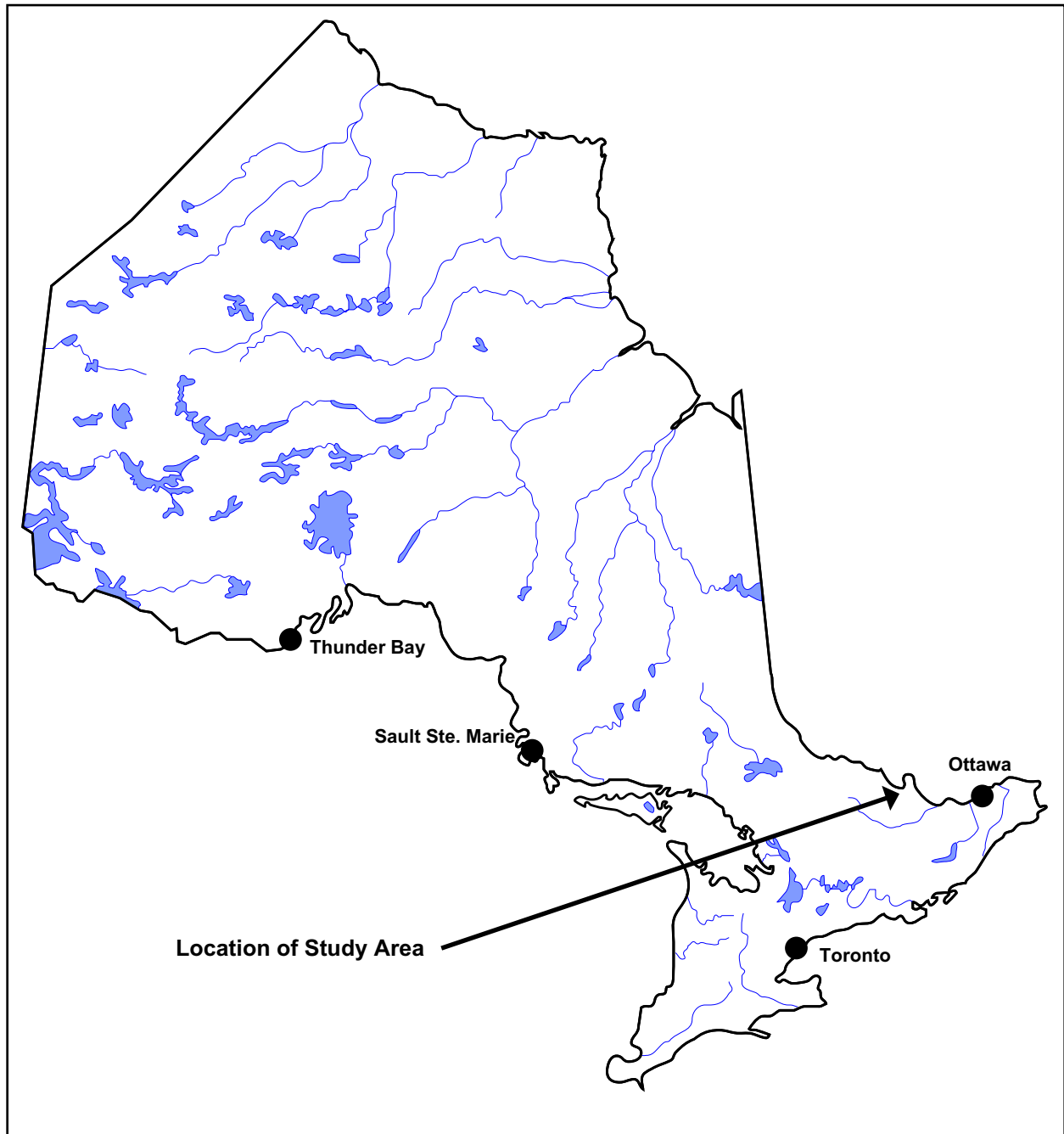


Figure 1. Location of the study area.

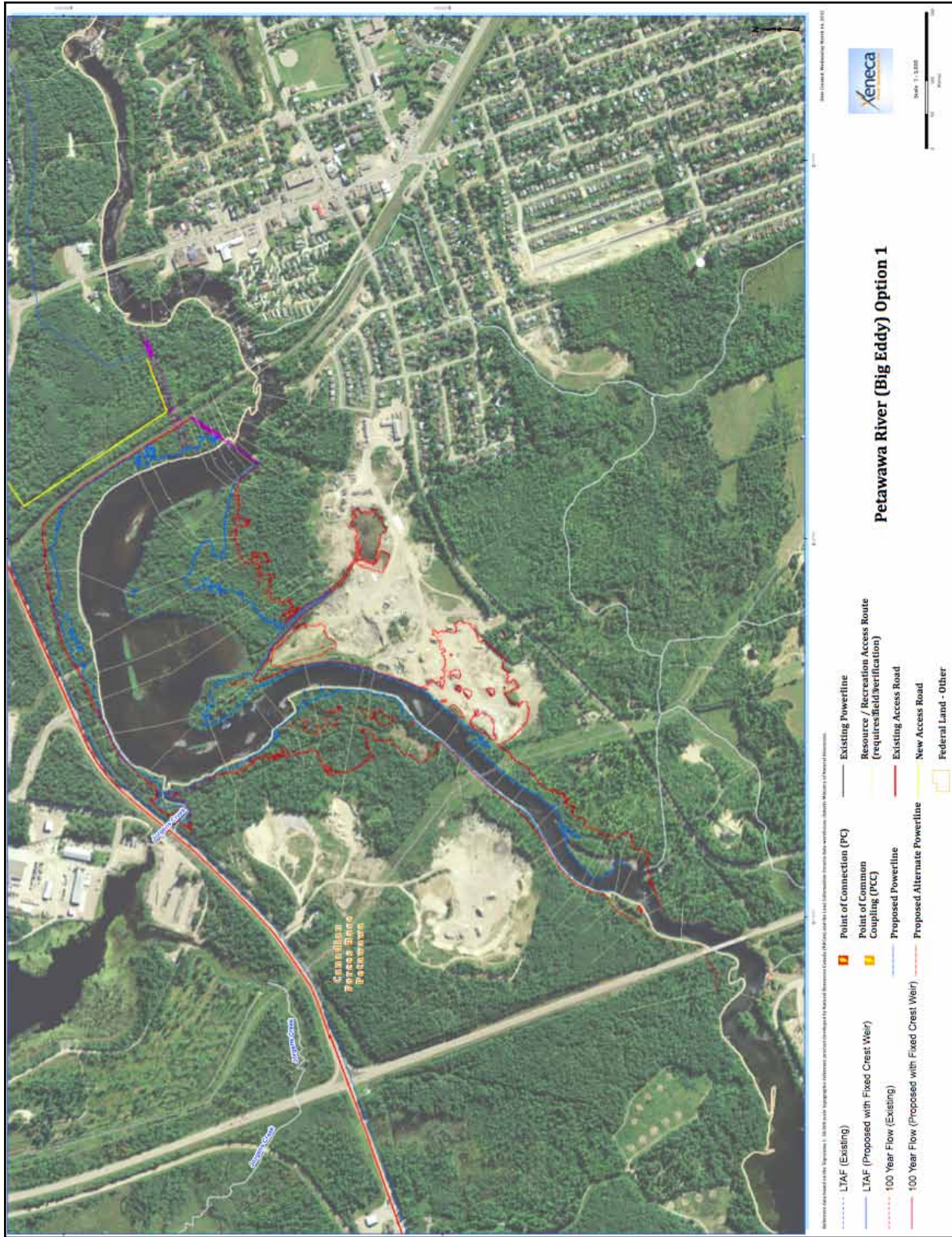


Figure 2. Proposed hydro power development plans at tBig Eddy Rapids, Petawawa River.



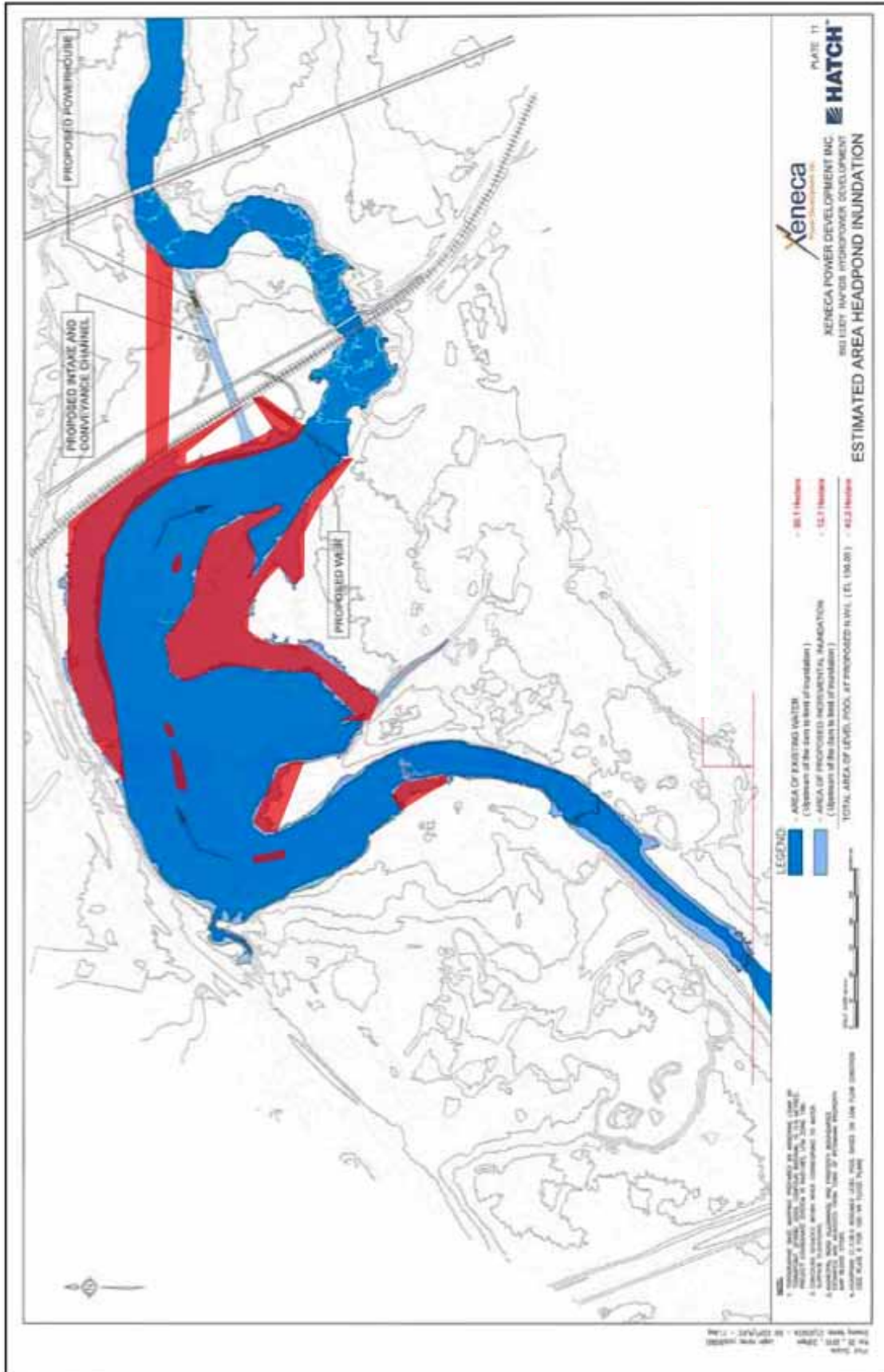


Figure 3. Areas of high potential (shown in red) presented in the Stage 1 report at Big Eddy Rapids, Petawawa River.

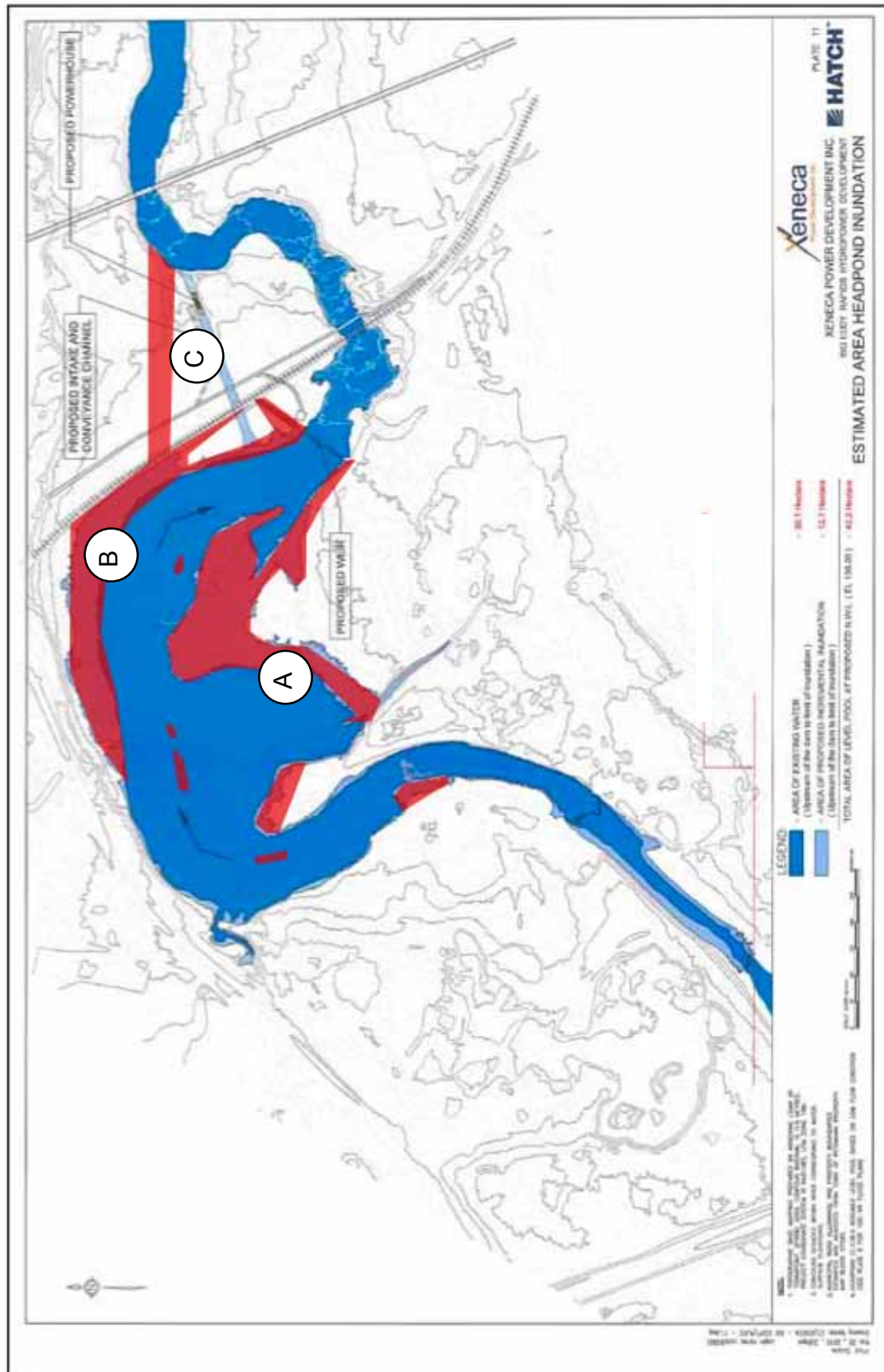


Figure 4. Location of high potential areas examined in this Stage 2 study. Areas of high potential are shown in red.

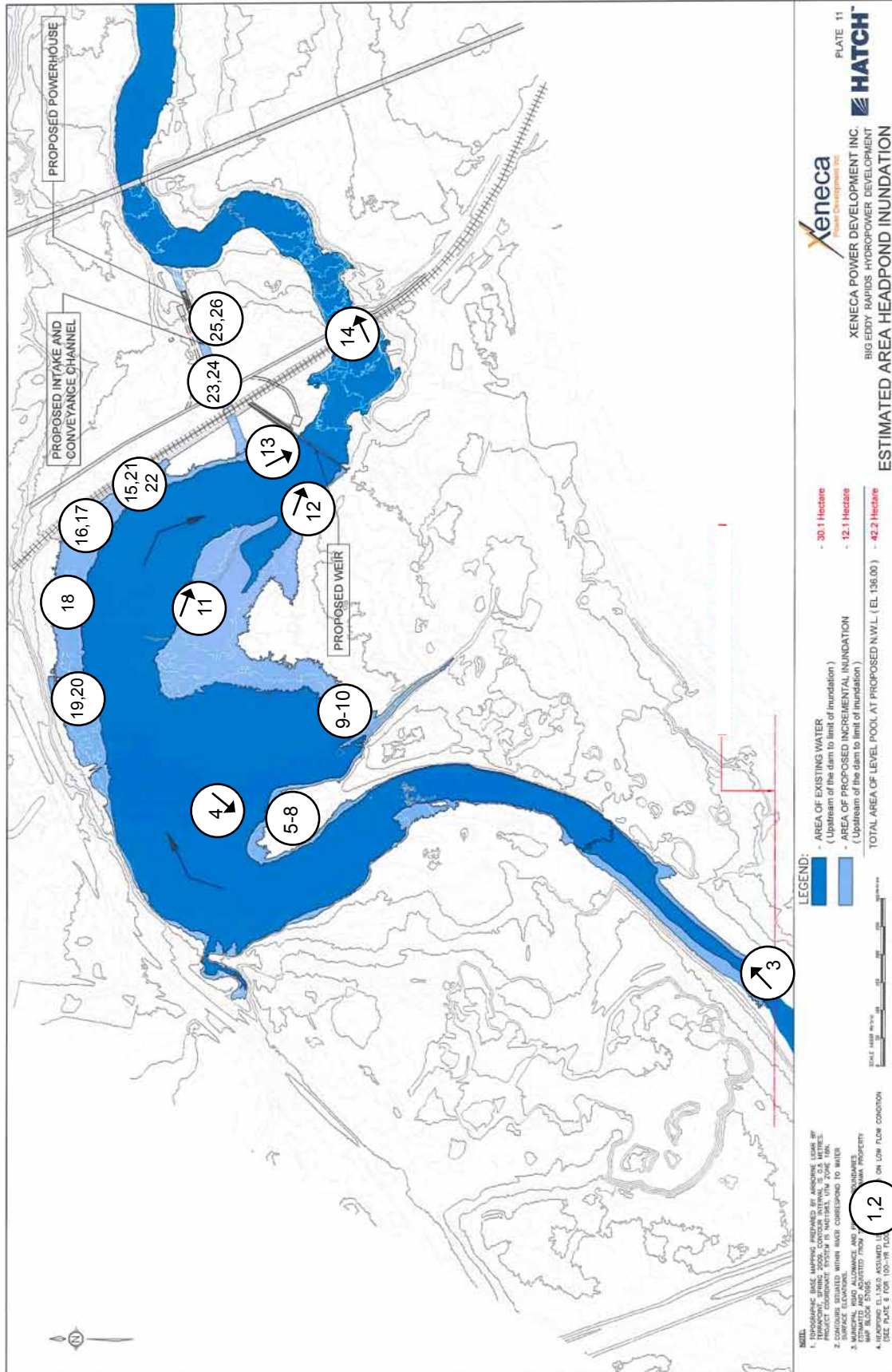


Figure 5. Location of photos shown in this report.





Photo 1. Looking downstream at the gas pipeline crossing, south shore.



Photo 2. Looking downstream across the gas pipeline crossing, south shore.





Photo 3. Charlie Binguis examining the south shore in the vicinity of the gravel/sand quarry.



Photo 4. Cobble shoreline, south shore of the river, looking upstream





Photo 5. Charlie Binguis excavating test pits, south shore, Petawawa River.



Photo 6 Typical 'modified terrain encountered along south shore, Petawawa River.





Photo 7. Typical test pit excavated in High Potential Area A, south shore, Petawawa River.



Photo 8. Old access road/trail into High Potential Area A, south shore, Petawawa River.





Photo 9. Typical seasonally inundated littoral zone, south shore, Petawawa River.



Photo 10. Typical seasonally inundated littoral zone, south shore, Petawawa River.



Photo 11. Charlie Binguis examining the shoreline in Area A, south shore, Petawawa River.



Photo 12. General view of the location of the proposed weir, Petawawa River, looking downstream.





Photo 13. Looking downstream from the general location of the proposed weir, Petawawa River.



Photo 14. Big Eddy rapids, looking downstream from the railway bridge.



Photo 15. Typical shoreline encountered in the area of High Potential B.



Photo 16. Typical shoreline encountered in the area of High Potential B.





Photo 17. Typical shoreline encountered in the area of High Potential B.



Photo 18. Typical shoreline encountered in the area of High Potential B.





Photo 19. Typical test pit excavated in High Potential Area B, north shore, Petawawa River.



Photo 20. UXO technician, north shore, Petawawa River.





Photo 21. Old road/access trail into High Potential Area B, north shore, Petawawa River.



Photo 22. Piled cobbles, north shore, Petawawa River.





Photo 23. Asphalt trail in the park in Area C, north shore of Petawawa River.



Photo 24. Typical terrain encountered in the park in Area C, north shore of Petawawa River.





Photo 25. Typical terrain encountered in the park in Area C, north shore of Petawawa River.



Photo 26. Typical terrain encountered in the park in Area C, north shore of Petawawa River.