Appendix G

Archaeological Impact Assessment (Final), June 2014 and Archaeological Field Evaluation and Shovel Testing (Draft), February 2015, Cultural Resources Management

DEFENCE CONSTRUCTION CANADA

CFB GAGETOWN TRANSFER OF WASTEWATER TREATMENT RESPONSIBILITIES ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK

FINAL REPORT

Submitted to:
Defence Construction Canada
and the
Archaeological Services of the
New Brunswick Department of Tourism, Heritage & Culture

Prepared by:
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Report Preparation: Robert H. J. Shears

Archaeological Field Research Permit Number: 2014NB2

CRM Group Project Number: 14-0001-01

JUNE 2014

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CFB GAGETOWN TRANSFER OF WASTEWATER TREATMENT RESPONSIBILITIES - ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK

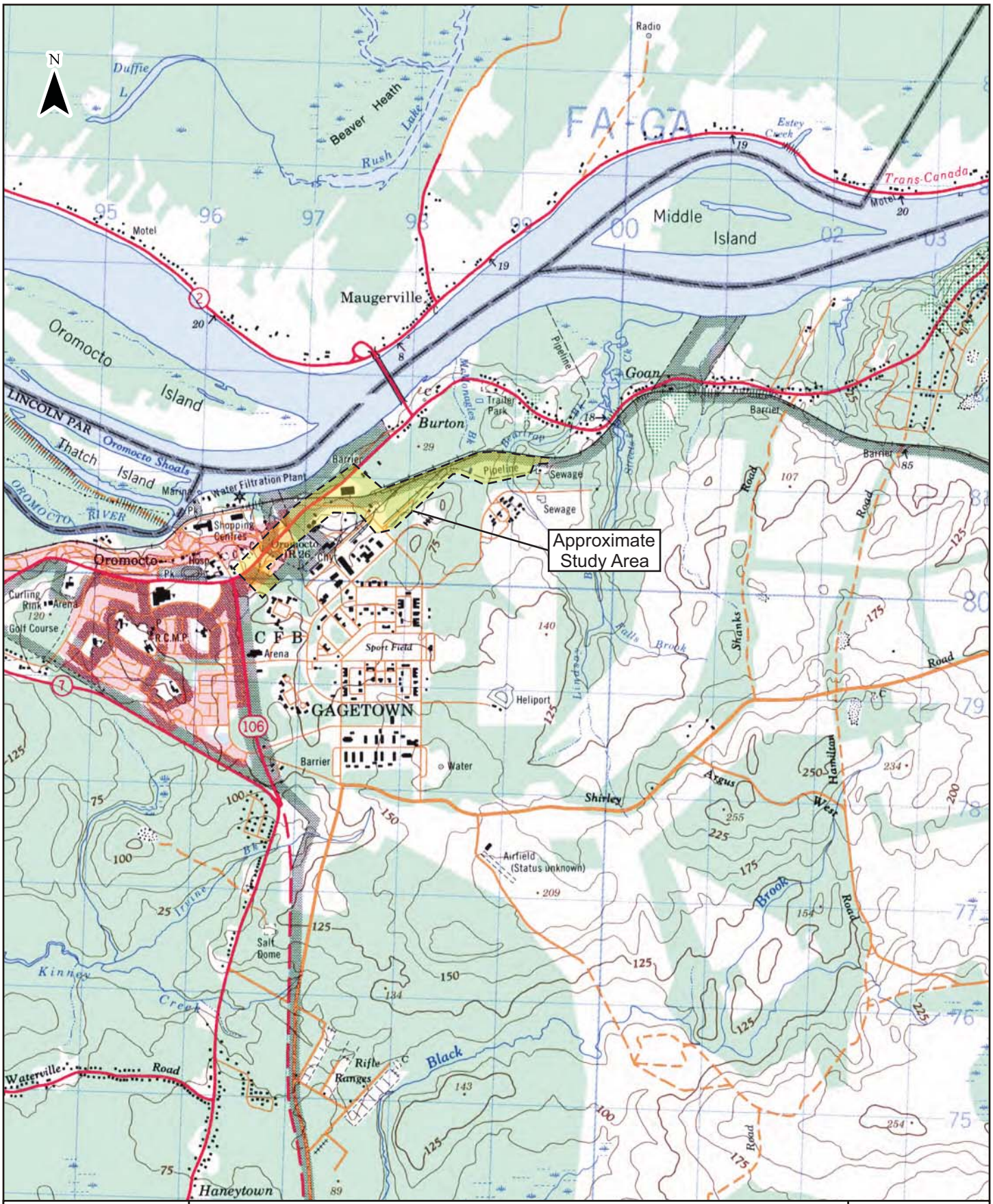
1.0 INTRODUCTION

Defence Construction Canada (DCC) is scheduled to transfer responsibilities for the supply and treatment of water and wastewater from Canadian Forces Base (CFB) Gagetown to the town of Oromocto (***Figure 1***). The transfer includes the construction of new water and wastewater treatment facilities and associated infrastructure. Due to the potential of encountering historically and/or archaeologically significant resources associated with Precontact and/or historic Native or Euro-Canadian land use at the proposed site, DCC required the services of a consulting archaeologist to undertake a comprehensive archaeological impact assessment prior to construction of the facility.

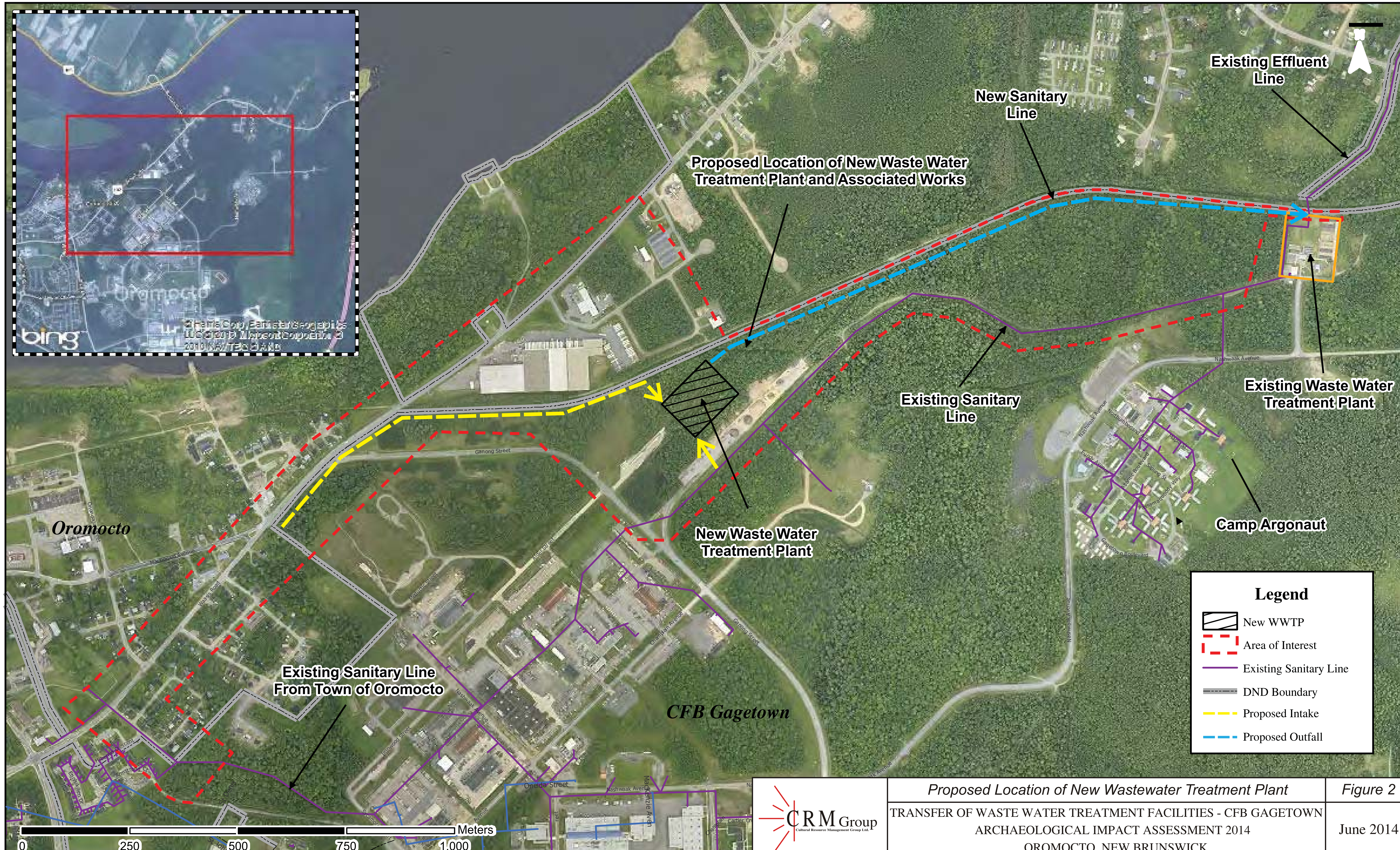
Cultural Resource Management (CRM) Group Limited was retained by Dillon Consulting Limited (Dillon) on behalf of DCC to conduct preliminary archaeological investigations of properties associated with the proposed transfer of water and wastewater responsibilities. These investigations will form part of an Environmental Impact Assessment conducted in accordance with New Brunswick's *Environmental Impact Assessment Regulation* (Regulation 87-83) for the two selected sites for the location of a new Water Treatment Plant and a new Wastewater Treatment Plant. This report pertains to the site of the new Wastewater Treatment Plant (WWTP) (***Figure 2***).

The archaeological impact assessment was conducted by CRM Group Archaeologist, Robert Shears, with the assistance of Archaeological Technician, Kyle Cigolotti. Technical oversight for the project was provided by W. Bruce Stewart, CRM Group President and Senior Technical Advisor.

The archaeological investigation was conducted on May 29-30, 2014, according to the terms of Archaeological Research Field Permit 2014NB2, issued to Shears through New Brunswick Archaeological Services Branch of the Department of Tourism Heritage and Culture. This report describes an Archaeological Impact Assessment and Reconnaissance of the proposed wastewater treatment facility study area, presents the results of these efforts and offers cultural resource management recommendations.



CRM Group Cultural Resource Management Group Ltd.	*Approximate Study Area*	*Figure 1*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014 Scale 1:50 000



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Proposed Location of New Wastewater Treatment Plant	Figure 2
TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014

2.0 STUDY AREA

The proposed location for the new WWTP is on an undeveloped parcel of land on Ganong Street in Oromocto, approximately 250 metres southeast of the Sobey's Distribution Centre on Waasis Road (***Figure 2***). The larger study area for the WWTP site extends from Armstrong Court in the southwest to the existing WWTP on Nashwaak Street in the northeast. The proposed route for the WWTP intake pipeline extends along Waasis Road from the boundary of DND property, opposite Hiawatha Avenue, eastward along the former railway bed (now utilized as a walking trail), to the proposed WWTP site. The proposed route for the WWTP outflow pipeline extends from the proposed WWTP site, along the former railway bed eastward to the site of the existing WWTP site. Access to the study area is available through numerous public streets and access roads.

3.0 METHODOLOGY

Defence Construction Canada is scheduled to transfer responsibilities for the supply and treatment of water and wastewater from CFB Gagetown to the town of Oromocto. The transfer includes the construction of new water and wastewater treatment facilities and associated infrastructure. Due to the potential of encountering historically and/or archaeologically significant resources associated with Precontact and/or historic Native or early Euro-Canadian land use at the proposed site, DCC requires the services of a consulting archaeologist to undertake a comprehensive archaeological impact assessment prior to construction of the facility.

Cultural Resource Management Group Limited has been retained by Dillon on behalf of DCC to conduct preliminary archaeological investigations of properties associated with the proposed transfer of water and wastewater responsibilities. These investigations will form part of an Environmental Impact Assessment conducted in accordance with New Brunswick's *Environmental Impact Assessment Regulation* (Regulation 87-83) for the selected site for the location of a new Wastewater Treatment Plant.

In keeping with Archaeological Service's **Guidelines and Procedures for Conducting Professional Archaeological Assessments in New Brunswick**, the work plan consists of two components: background study/engagement with local individuals and/or groups; and, preliminary field examination.

3.1 Background Study/Local Engagement

The goals of the background study are twofold: firstly to gather historical and environmental information that would contribute to the identification of archaeological potential within the study area; and, secondly to provide a historical and cultural context within which to evaluate significance of any archaeological resources encountered.

Engagement with knowledgeable locals is intended to elicit information on the location, distribution and significance of reported and, sometimes, unreported heritage resources. Groups to be contacted include organizations, historical societies, collectors, and specialists having local or regional expertise in the history, geology and archaeology of the study area. Interviews are to be documented and submitted to Archaeological Services as part of the Final Report.

The background study included a review of the following: Heritage Branch records (including the New Brunswick Archaeological Site File, the Borden Map File, the Archaeological Projects Manuscripts and the Private Collections File, The New Brunswick Plane Crash Inventory and the New Brunswick Cemeteries Database); The Canadian Inventory of Historic Buildings; legal land grant records, and other pertinent records and inventory files found in the New Brunswick public archives, including published and unpublished reports of local and regional history as well as heritage investigations or surveys within or adjacent to the project area. Lastly, digital scans of historic aerial photographs of the study were acquired from the Department of Natural Resources Library. A representative of the Base Gagetown Community Historical Association was contacted for local historical information.

3.2 Preliminary Field Examination

The goal of the preliminary field examination was to provide firsthand exposure to the geographical setting and topography of the study area. This exposure will facilitate the preparation of the testing strategy for the Field Evaluation stage of archaeological investigations.

During the preliminary field examination, CRM Group archaeologists followed up on potential resources identified as a result of the background study. Visual assessment of the development area was conducted by walking a series of transects across the study area, and inspecting any trails or abandoned roads identified while in the field. The field examination was documented in the form of field notes and photographs. Track logs and waypoints were recorded with handheld Global Positioning System (GPS) units.

4.0 RESULTS

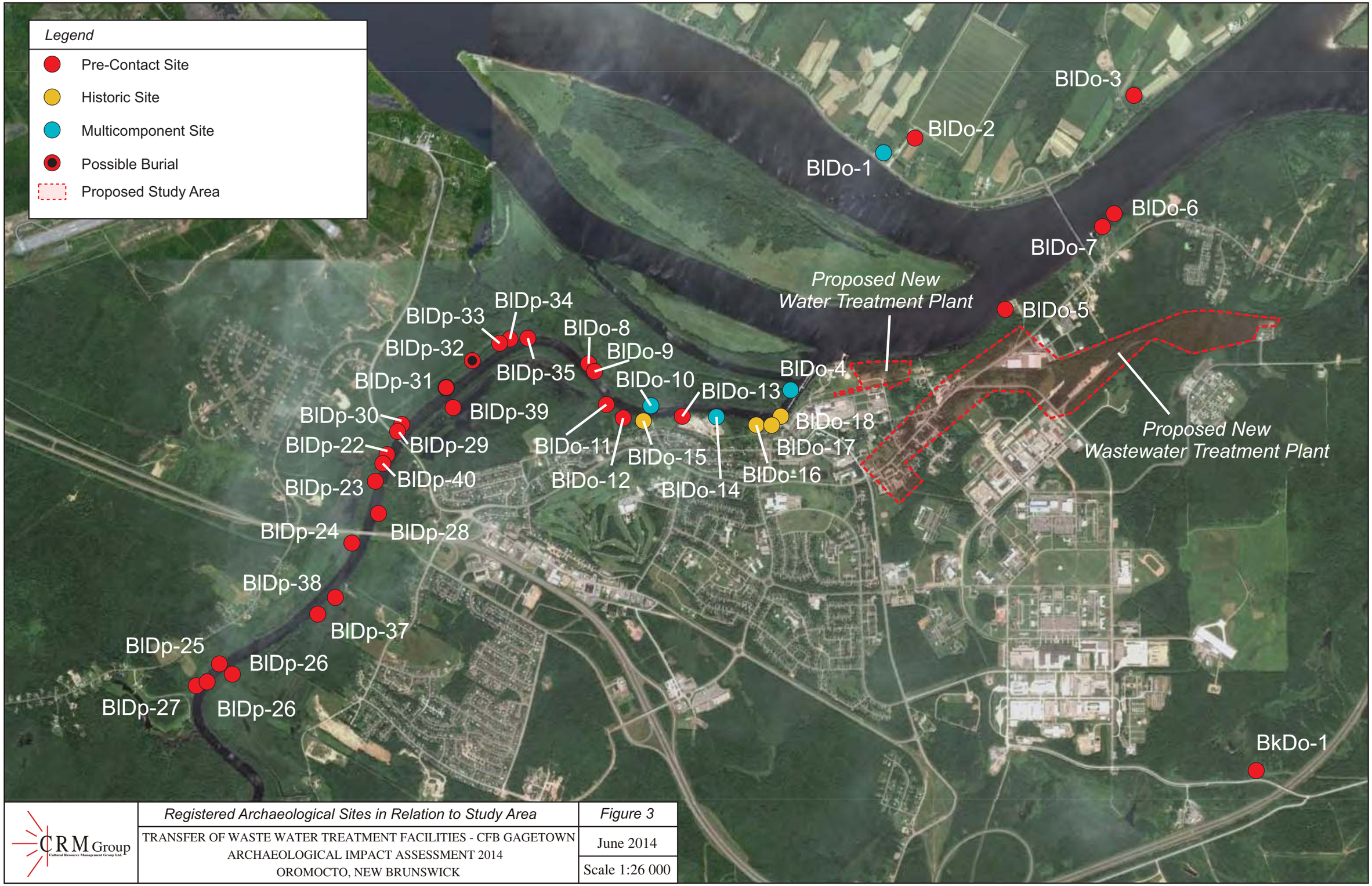
4.1 Background Study

The study area for the WWTP lies within the watershed of the Saint John River and is bordered by the mouth of the Oromocto River, approximately 850 metres to the northwest. These watercourses were extensively used as transportation routes in Precontact and historic times (Ganong 1899; Raymond 1910; Washburn and Gillis 1994). These rivers lie within Wolastoqiyik territory and bear names in their language. The Wolastoqiyik word for the Saint John River is "Wolastoq", meaning "Beautiful River", and is the word from which the people derive their name. The Oromocto River's name is derived from the Wolastoqiyik word "Welamoktuk", meaning "good river for easy canoe navigation" (Hamilton 1997; LeSourd 2007:17). The banks of the Saint John and Oromocto rivers have been inhabited by First Nations peoples for thousands of years. There are 33 registered Precontact or multi-component (Precontact and Historic) archaeological sites within 6 kilometres of the study area, which date from the Palaeo-Indian (> 9000 BP) to Maritime Woodland (3000 BP - 500 BP) Periods (***Figure 3***). Most of the sites lay along the banks of the Oromocto River, with five sites located near or along the Saint John River. The site nearest to the study area (BlDo-5, the Amphibious Fast Water Training Site) is a Historic domestic site, located along the Saint John River, approximately 230 metres to the north. A cluster of sites (BlDo-16, BlDo-17 & BlDo-18), all historic period in nature, lie approximately 600 metres to the northwest. The study area is also adjacent to the registered cemetery at St. Vincent de Paul Catholic Church, located at 29 Loisville Street. This cemetery contains grave markers dated to the mid-nineteenth century and is still in use today.

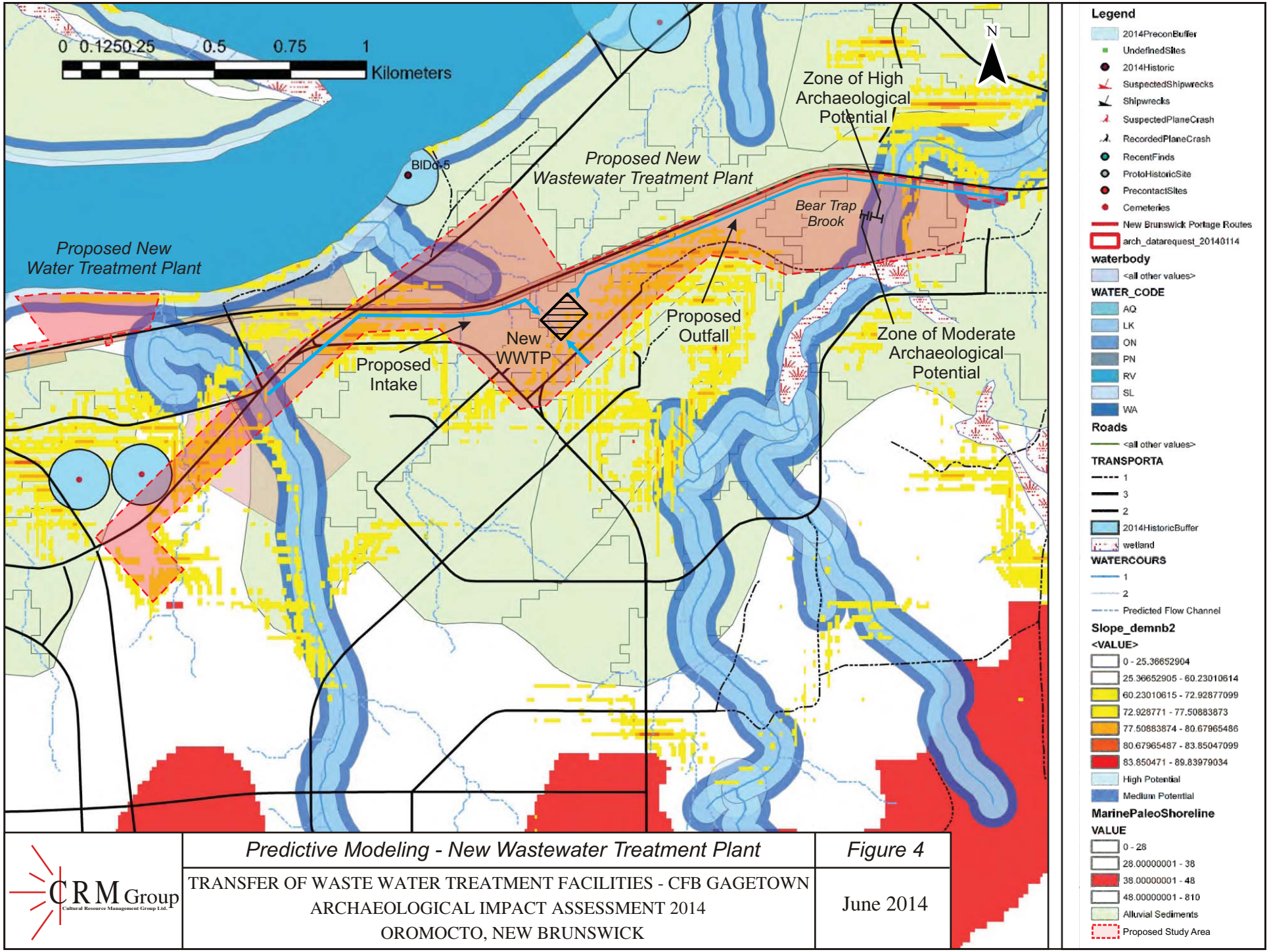
Predictive modelling data for archaeological potential within the WWTP study area was obtained from New Brunswick Archaeological Services (***Figure 4***). The broad study area intersects three watercourses which are ascribed high archaeological potential. A zone of high archaeological potential is assigned for a distance of 50 metres from the bank of the watercourses, with a zone of moderate potential extending out for an additional 30 metres. However, the proposed area of impact for the WWTP and related pipeline infrastructure directly intersect only two of these zones of elevated archaeological potential.

The Saint John River Valley was first settled by Europeans with the arrival of the French in the late seventeenth century. The Seigneury at Oromocto, which included a tract of land on either side of the Saint John River, was granted to Mathieu d'Amour, Sieur de Freneuse. An estate, which included a "house, barns, etc.", is indicated on a Franquelin map from 1686 (***Figure 5***). A census from 1698 lists 36 settlers in the settlement of Freneuse (Ganong 1899:271). A British report from 1762 estimates the size of cleared land at Oromocto:

> ...the first real Settlement is about 60 miles above the Fort [at Saint John], where the River Remucta [Oromocto] falls into the River St. Johns: here I'm told there is about 300 acres of clear Land, chiefly on the River Remucta, which I did not see. (Bruce to Belcher, 1762; Ganong 1899:271).



CRM Group Cultural Resource Management Group Ltd.	*Registered Archaeological Sites in Relation to Study Area*	*Figure 3*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014 Scale 1:26 000



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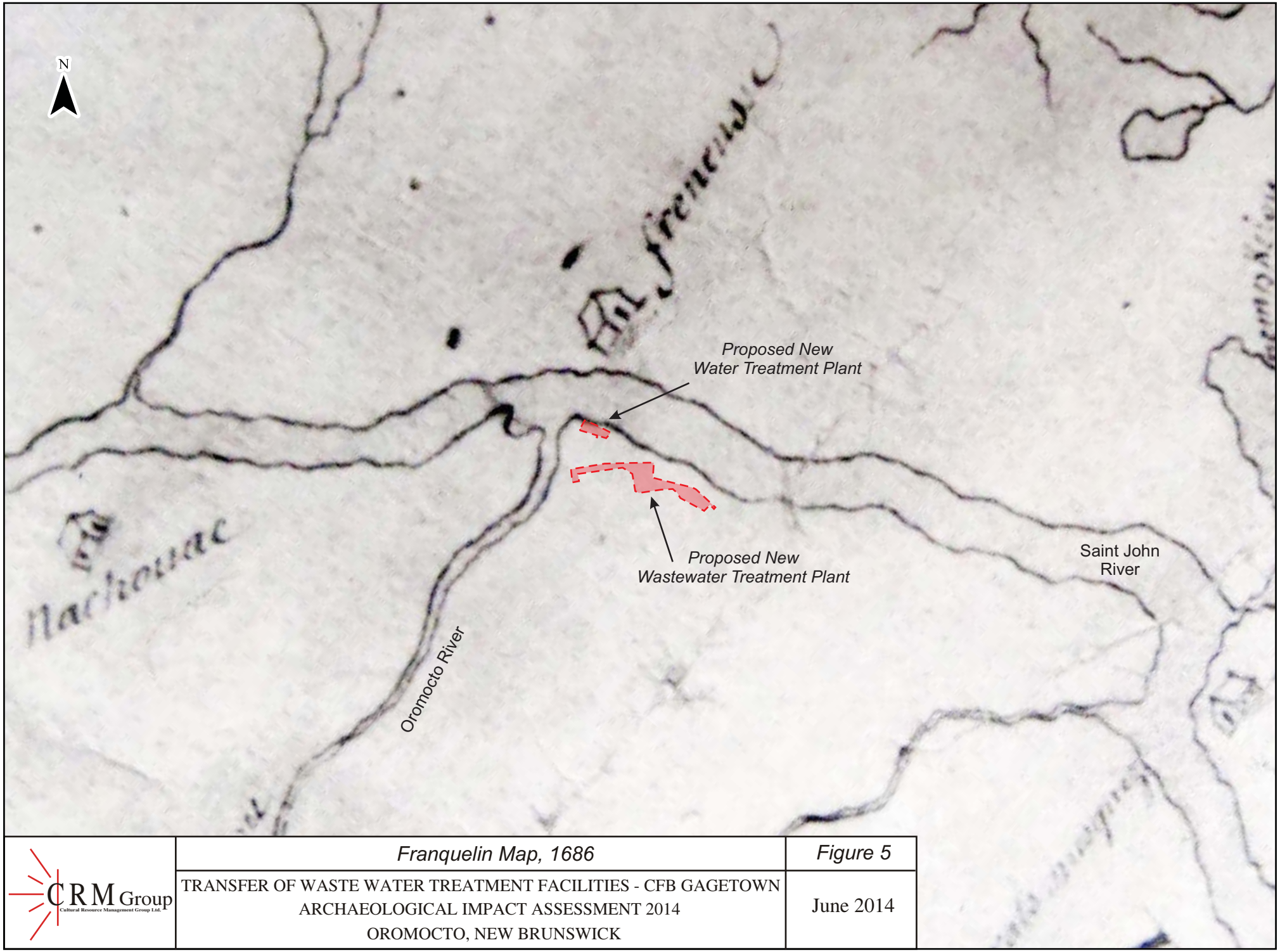
Predictive Modeling - New Wastewater Treatment Plant

Figure 4

TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN
ARCHAEOLOGICAL IMPACT ASSESSMENT 2014
OROMOCTO, NEW BRUNSWICK

June 2014



CRM Group Cultural Resource Management Group Ltd.	*Franquelin Map, 1686*	*Figure 5*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014

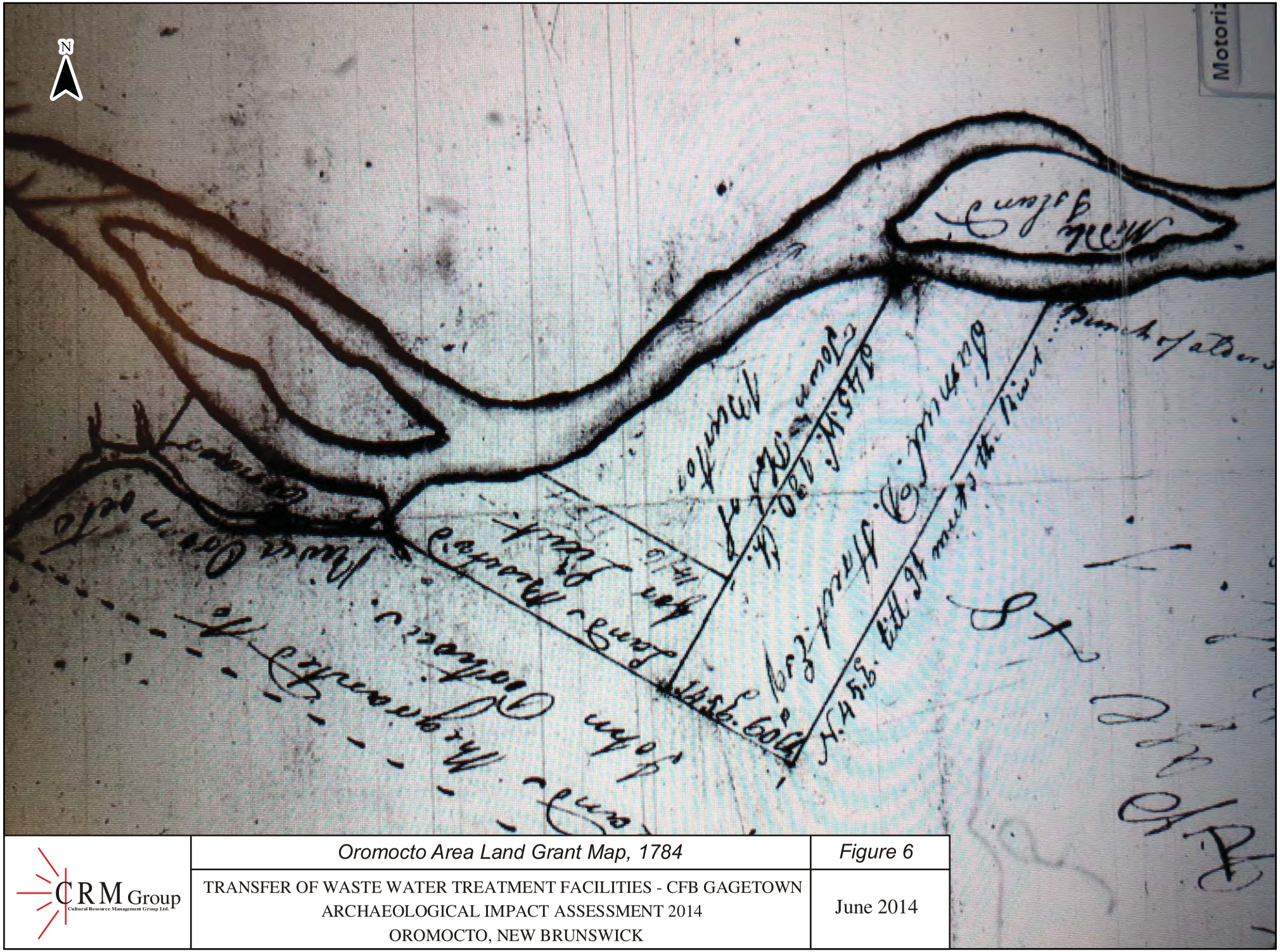
Permanent British settlement began by 1763, following the Acadian Deportation (Washburn and Gillis 1994). By the early 1780s, and the arrival of Loyalist settlers to the Saint John Valley, "some forty-two families were scattered along the [Saint John] river, of whom several were at the mouth of the Oromocto" (Ganong 1899:326). Fort Hughes, a blockhouse fort named after Richard Hughes, Lieutenant Governor of Nova Scotia, was erected in 1780 at the mouth of the Oromocto River, west of the proposed wastewater treatment plant study area. The American Revolution had begun four years earlier, thus the blockhouse was erected to protect the ever-increasing strategic importance of the Saint John River as a conduit of communication between Halifax, Quebec and New York (Ganong 1899:241; Raymond 1910:467). Lieutenant Constant Connor was commissioned to command the fort, which was active until 1783 Early land grant maps include lots within modern Oromocto including a grant of 100 acres issued to Lieutenant Connor, including the blockhouse site, for "Services as agent for the proprietors" (Connor 1785). This grant encloses the study area and extends across the mouth of the Oromocto River (***Figure 6***).

By the end of the eighteenth century, the bank of the Saint John River in the vicinity of the study area was dotted with inhabitants. A map of the area from 1799 shows numerous structures at Maugerville, on the north side of the river, with a road along the south bank that forked to cross the Oromocto River at two locations which then merge to bisect the WWTP study area (***Figure 7***).

In the early nineteenth century, shipbuilding became an important industry at the mouth of the Oromocto River. By 1825, an Episcopal Church was built in what is now modern Oromocto (Fisher 1825:61). ***Figure 8*** is an 1846 map of the Saint John River, by William Fitzwilliam Owen. It shows roads along the Saint John River. A structures identified in the map legend with the letter 'e' and described as the "Yett. Cottage on the Bank" is located north of the study area. The residence of a "Nevers" appears to fall within the larger WWTP study area.

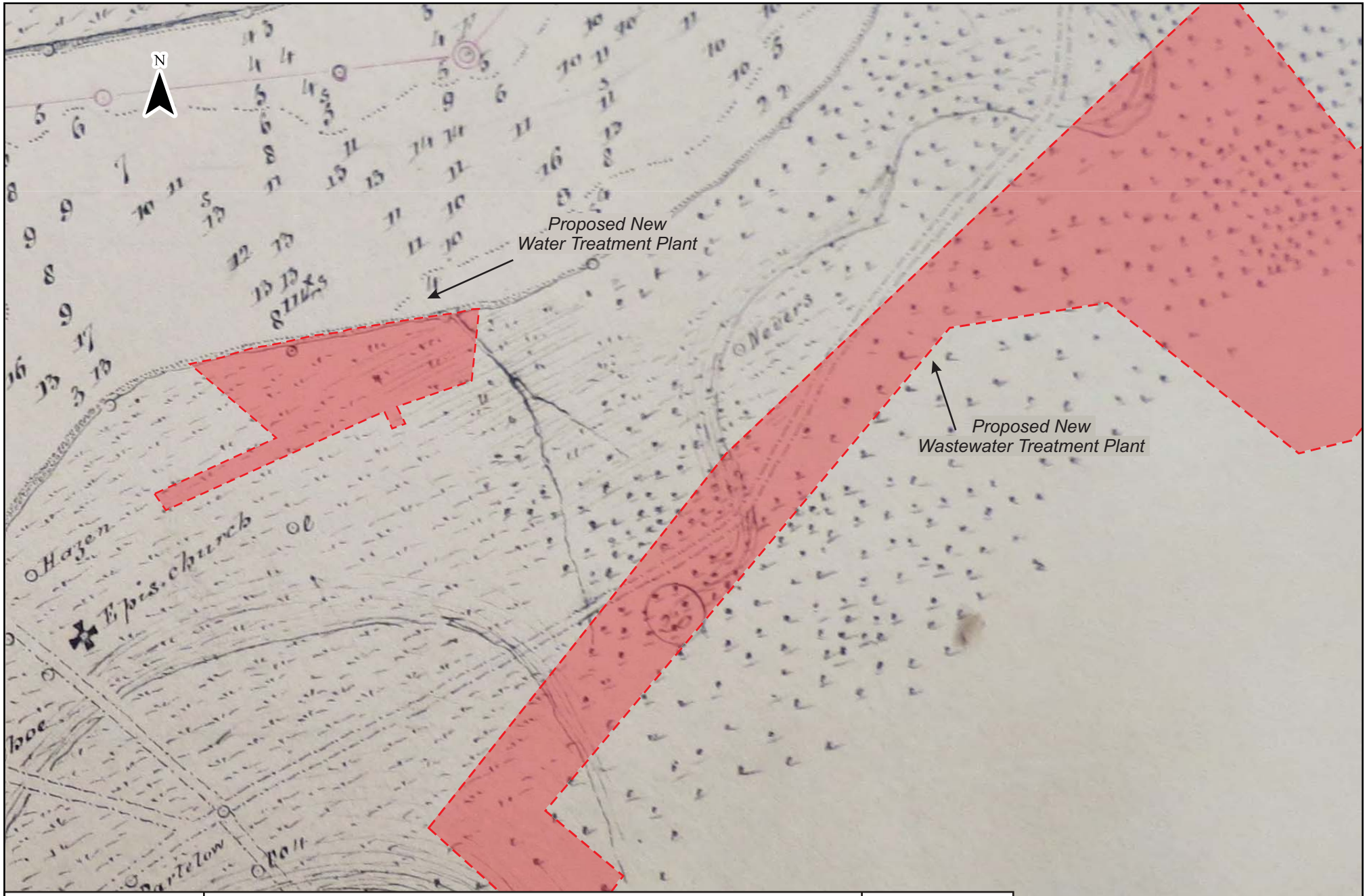
A review of aerial photography from the 1930s to the 1950s shows the larger WWTP site as covering a variety of wooded and residential areas (***Figure 9***). A lone building visible in photographs from 1934 and 1951 may be the structure identified in Figure 8 as the "Nevers" house. The field containing the house is now the site of a residential neighbourhood at Hiawatha Court and Mahsos Street in Oromocto.

The International Railway of Maine, subsequently incorporated into the Canadian National Railway, that ran between Lac-Mégantic, Quebec and Mattawamkeag, Maine, via Saint John, was constructed during the 1880s. In the early 1950s, the Canadian Government created CFB Gagetown, resulting in the expropriation of properties in the communities of Petersville, Hibernia, New Jerusalem and others. The village of Oromocto was re-designed as a planned town in preparation for the influx of service personnel. The population of Oromocto ballooned from 661 residents in 1956 to 12,170 by 1961. The Railway, was decommissioned in 1996 and the railway right-of-way has been developed as a recreational trail that extends along much of the study area.



CRM Group Cultural Resource Management Group Ltd.	*Oromocto Area Land Grant Map, 1784*	*Figure 6*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014

CRM Group Cultural Resource Management Group Ltd.	*Campbell Map, 1799*	*Figure 7*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014



CRM Group Cultural Resource Management Group Ltd.	*Owen Map, 1846*	*Figure 8*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014

CRM Group Cultural Resource Management Group Ltd.	*Aerial Photographs, 1934 & 1951*	*Figure 9*
	TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014

4.2 Field Reconnaissance

The archaeological reconnaissance was undertaken on May 29-30, 2014, under clear conditions. The time of year, before the full eruption of springtime leaf and brush cover, provided increased visibility during the reconnaissance. The goals of the visit were to assess the study area for archaeological potential and investigate any topographical and/or cultural features that had been identified as areas of elevated potential during the background study. The reconnaissance evaluated the study area for archaeological potential and investigated any observed topographical and/or cultural features. This was achieved through focused pedestrian transects of the study area (***Figure 10***), which was divided into four sections (***Figure 11***).

While conducting the reconnaissance, the archaeologist team searched for signs of historic land use (*e.g.* leveled ground, anomalous mounds or depressions, structural features, artifact exposures and vestige populations of domestic plants) and the presence of environmental conditions recognized as being conducive to past settlement (relatively flat, dry land close to transportation routes such as waterways, portage routes or early roads). Soil exposures within road-cuts, at the base of uprooted trees and along stream beds were examined for artifacts. The proposed route for the intake and outfall pipelines in the WWTP study area followed immediately south the alignment of the former railway bed from the existing WWTP in the east, to the intersection of the railway bed and Waasis Road, before turning to run south of Waasis Road to the intersection with MacDonald Avenue. This route is demarked by warning signage for the Transcontinental Cable Route.

Section One

Section One included the easternmost portion of the study area, from the existing wastewater treatment facility to a narrowing of the study area at UTM 19T 698388E, 5081329N. This section was bounded to the east by the existing wastewater treatment facility and infrastructure, to the south by a graded trail system that followed the route of the existing municipal sanitary line and to the north by the former railway bed that is the proposed route of the new WWTP outfall line. Camp Argonaut, an army cadet summer training centre, also lies south of this section of the study area. Aside from the above mentioned features, this section was generally wooded and undeveloped.

Predictive modeling of this portion of the study area indicated a watercourse, Bear Trap Brook, as exhibiting high potential for containing archaeological resources. The watercourse ran through the study area in a low, seasonally wet area that contained areas of standing water and marsh (***Plate 1***). In the south, the brook is directed under the graded trail through a concrete and dry-stone culvert (***Plate 2***), while in the north, it is routed under the railway bed. Despite these flow control measures, the local topography suggests that the brook is still following its natural course.

As stated previously, predictive modeling of the study area indicates a zone of elevated archaeological potential, totaling 80 metres in width, extending from the banks of significant watercourses. The first 50 metres from a watercourse is ascribed high potential, while the following 30 metres are ascribed moderate potential. Aside from the modern infrastructure, the topography surrounding Bear Trap Brook is level or gently sloping and relatively flat within the zone of elevated archaeological potential for the full width of the study area (***Plate 3***). The remainder of Section One was comprised of undeveloped forest which has been used for camping by cadets from Camp Argonaut, but is otherwise undeveloped (***Plate 4***). Areas outside the zone of elevated potential surrounding Bear Trap Brook exhibited low potential for containing archaeological resources.

Existing Effluent Line

New Sanitary Line

Proposed Location of New Waste Water Treatment Plant and Associated Works

Existing Waste Water Treatment Plant

Existing Sanitary Line

New Waste Water Treatment Plant

Camp Argonaut

Existing Sanitary Line From Town of Oromocto

Oromocto

CFB Gagetown

Ganong Street

MacDonald Avenue

Wallace Road

Morel Street

Nashwaak Avenue

Oneida Street

Gagetown Boulevard

Meters

0 250 500 750 1,000

Legend

- New WWTP
- Area of Interest
- Existing Sanitary Line
- DND Boundary
- Proposed Intake
- Proposed Outfall

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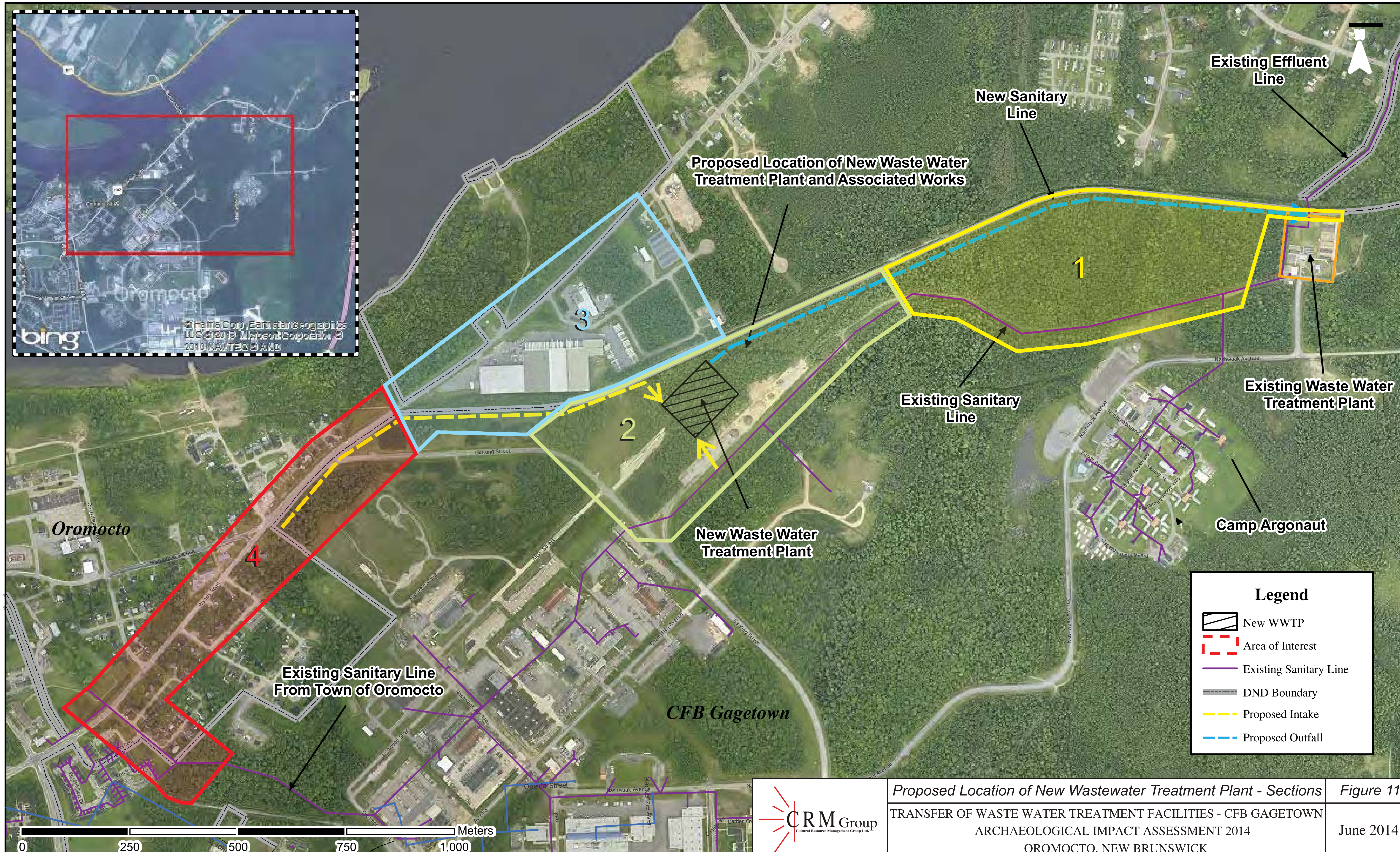
Proposed Location of New Wastewater Treatment Plant- Track Log	*Figure 11*
TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL IMPACT ASSESSMENT 2014 OROMOCTO, NEW BRUNSWICK	June 2014



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Proposed Location of New Wastewater Treatment Plant - Sections

Figure 11

TRANSFER OF WASTE WATER TREATMENT FACILITIES - CFB GAGETOWN
ARCHAEOLOGICAL IMPACT ASSESSMENT 2014
OROMOCTO, NEW BRUNSWICK

June 2014

PLATE 1: **Bear Trap Brook in Section One of the WWTP study area; facing southwest; May 30, 2014.**

PLATE 2: **Concrete and dry stone culvert at Bear Trap Brook in southern end of Section One; facing south; May 30, 2014.**

PLATE 3: **Gently sloping, flat terrain within the zone of moderate archaeological potential for the east bank of Bear Trap Brook; facing southwest; May 30, 2014.**

PLATE 4: **Lean-to in Section One, west of Bear Trap Brook; facing southeast; May 30, 2014.**

Section Two

This section contains the proposed site for the wastewater treatment facility. It is bounded on the south by the route of the existing municipal sanitary line, on the west by Ganong Street and on the north by the former railway alignment. Toward the southern end of Section Two is an active crushed stone and gravel storage facility (UTM 19T 698014E, 5080999N). The section also contained an active storage area for concrete culverts (UTM 19T 697794E, 5080946N), which follows the east-west alignment of Alder Street. An abandoned road or possible railway spur extending east form the storage area also follows this alignment and bisects the site for the proposed wastewater treatment facility (***Plates 5 & 6***). Pieces of discarded rail and tie plates as well as sections of guardrail, discarded steel culverts and other modern garbage were identified along this abandoned roadbed. Given the age of the discarded material, and the immature tree cover, it is estimated that this roadway has been abandoned for approximately 10-20 years. Outside these areas, the section contained undeveloped forested land, with no significant watercourses, and exhibited low potential for encountering archaeological resources.

PLATE 5: Storage area in Section Two; facing west; May 29, 2014.

PLATE 6: Former roadbed east of storage area; facing west; May 29, 2014.

Section Three

Section Three is bounded on the north by Waasis Road, on the east by a self-storage facility and Lutes Street and on the south by the former railway bed. The majority of this section contains commercial development such as a Sobey's distribution centre and the aforementioned storage facility. Two small parcels of undeveloped land were surveyed and were ascribed low archaeological potential. An unnamed watercourse running through this section toward the Saint John River is indicated by predictive modeling as containing elevated archaeological potential. The watercourse passes through the Sobey's distribution centre property and is routed via buried piping and culverts north of the study area across Waasis Road (***Plate 7***). Given the level of disturbance associated with the development within Section Three, the route of this buried watercourse is ascribed low potential for encountering archaeological resources.

Section Four

Section Four comprised the westernmost portion of the study area, from Armstrong Court in the west to the intersection of Waasis Road and Ganong Street in the east. It was bounded on the north by Waasis Road and by Department of National Defense property in the south. This section is largely comprised of developed residential properties. An unnamed watercourse that is ascribed elevated archaeological potential on the predictive model map runs north-south through the study area, approximately 90 metres northeast of Sacobie Boulevard (***Plate 8***). The watercourse lies in a small, steep-sided ravine with its west bank backed by residential properties. The east bank south of Waasis Road is a level plateau, approximately 3 metres above the waterline and is currently used as an ATV trail (***Plate 9***). The full width of the zone of elevated potential on the east bank was blocked by a chain link fence separating property belonging to CFB Gagetown

approximately 60 metres east of the watercourse. The watercourse is routed north of the study area under Waasis Road via a concrete culvert at the intersection of Waasis Road and Hiawatha Avenue. The portion of this unnamed watercourse south of Waasis Road, due to its location along a watercourse and flat and level plateau, is ascribed high and moderate archaeological potential as defined by the archaeological predictive model.

PLATE 7: **Unnamed watercourse at northern end of Section Three, north of Waasis Road; facing north; July 30, 2014.**

PLATE 8: Unnamed watercourse in Section Four; facing west; May 30, 2014.

PLATE 9: ATV trail along east bank of unnamed watercourse in Section 4; facing south; May 30, 2014.

Based on the various components of the background study, including environmental setting, predictive modeling and known Native land use, the west and east bank of Bear Trap Brook in Section One and the portion of east bank of the unnamed brook south of Waasis Road in Section Four, as outlined in the predictive model, is considered to exhibit elevated potential for encountering Precontact and/or early historic Native, as well as Euro-Canadian archaeological resources. All other areas outside of these zones, including the footprint for the proposed WWTP, are ascribed low potential for encountering archaeological resources.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2014 archaeological screening and reconnaissance of the proposed wastewater treatment plant study area consisted of historical background research and a visual inspection. It did not involve sub-surface testing. The background research and field reconnaissance of the WWTP study area conducted by CRM Group identified two areas that exhibit elevated potential for encountering either Native (both Precontact and historic) or Euro-Canadian archaeological resources. The first is the east and west bank of Bear Trap Brook, located in Section One, for a distance of 80 metres from the water's edge. The second is the east bank of an unnamed watercourse located south of Waasis Road in Section Four, for a distance of 80 metres from the water's edge.

Based on these results, CRM Group offers the following management recommendations for the study area:

1. Prior to any construction-related ground disturbance within the WWTP study area across the zone of elevated archaeological potential on the east and west banks of Bear Trap Brook in Section One, including excavation for the placement of the proposed WWTP outfall line, it is recommended that those areas be subjected to a program of archaeological shovel testing. The shovel testing program would include a series of shovel tests in a gridded pattern across the proposed construction footprint, in compliance with New Brunswick Archaeological Guidelines and Procedures.

2. Prior to any construction-related ground disturbance within the WWTP study area across the zone of elevated archaeological potential on the east bank of the unnamed watercourse in Section Four, including excavation for the placement of the proposed WWTP intake line, it is recommended that the area be subjected to a program of archaeological shovel testing. The shovel testing program would include a series of shovel tests in a gridded pattern across the proposed construction footprint, in compliance with New Brunswick Archaeological Guidelines and Procedures.

3. It is recommended that all other areas within the WWTP study area be cleared of any requirement for further archaeological investigation; and,

4. In the unlikely event that archaeological deposits or human remains are encountered during construction activities associated with the wastewater treatment plant site, all work in the associated area(s) should be halted and immediate contact made with New Brunswick Archaeological Services (Brent Suttie: (506) 453-3014).

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DEFENCE CONSTRUCTION CANADA

CFB GAGETOWN TRANSFER OF WATER & WASTEWATER TREATMENT RESPONSIBILITIES - FIELD EVALUATION & SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK

FINAL REPORT

Submitted to:
Defence Construction Canada
and
Archaeological Services of the
New Brunswick Department of Tourism, Heritage & Culture

Prepared by:
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Report Preparation: Robert H. J. Shears

Archaeological Field Research Permit Number: 2014NB104

CRM Group Project Number: 14-0001-02

FEBRUARY 2015

The following report may contain sensitive archaeological site data. Consequently, the report must not be published or made public without the written consent of New Brunswick's Director of Archaeological Services, Department of Tourism, Heritage & Culture.

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CFB GAGETOWN TRANSFER OF WATER & WASTEWATER TREATMENT RESPONSIBILITIES - FIELD EVALUATION & SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK

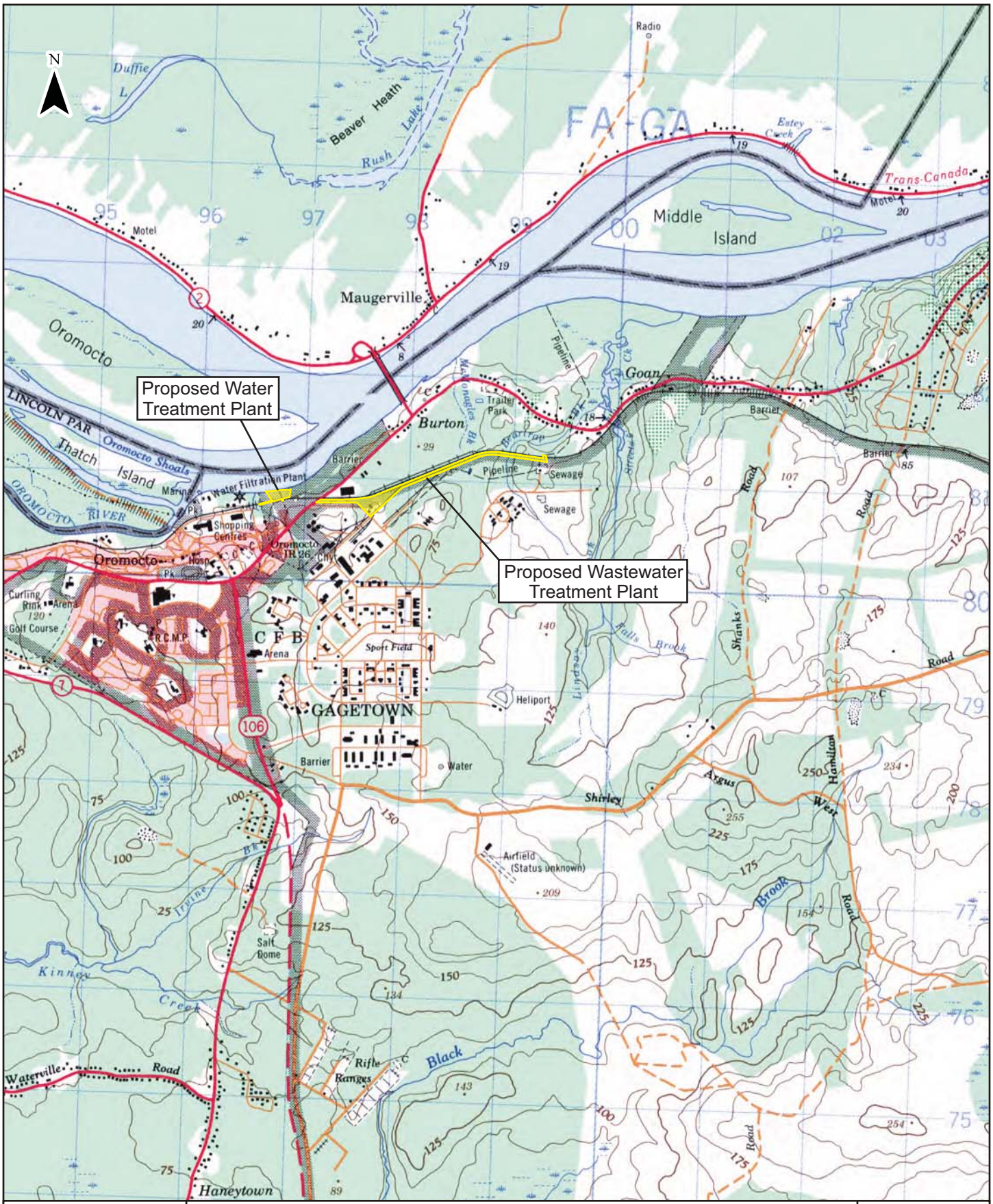
1.0 INTRODUCTION

Defence Construction Canada (DCC) is scheduled to transfer responsibilities for the supply and treatment of water and wastewater from Canadian Forces Base (CFB) Gagetown to the town of Oromocto (***Figure 1***). The transfer includes the construction of new water and wastewater treatment facilities and associated infrastructure. Due to the potential of encountering historically and/or archaeologically significant resources associated with Precontact and/or historic Native or early Euro-Canadian land use at the proposed sites, DCC required the services of a consulting archaeologist to undertake a comprehensive archaeological impact assessment prior to construction of the facilities and related infrastructure.

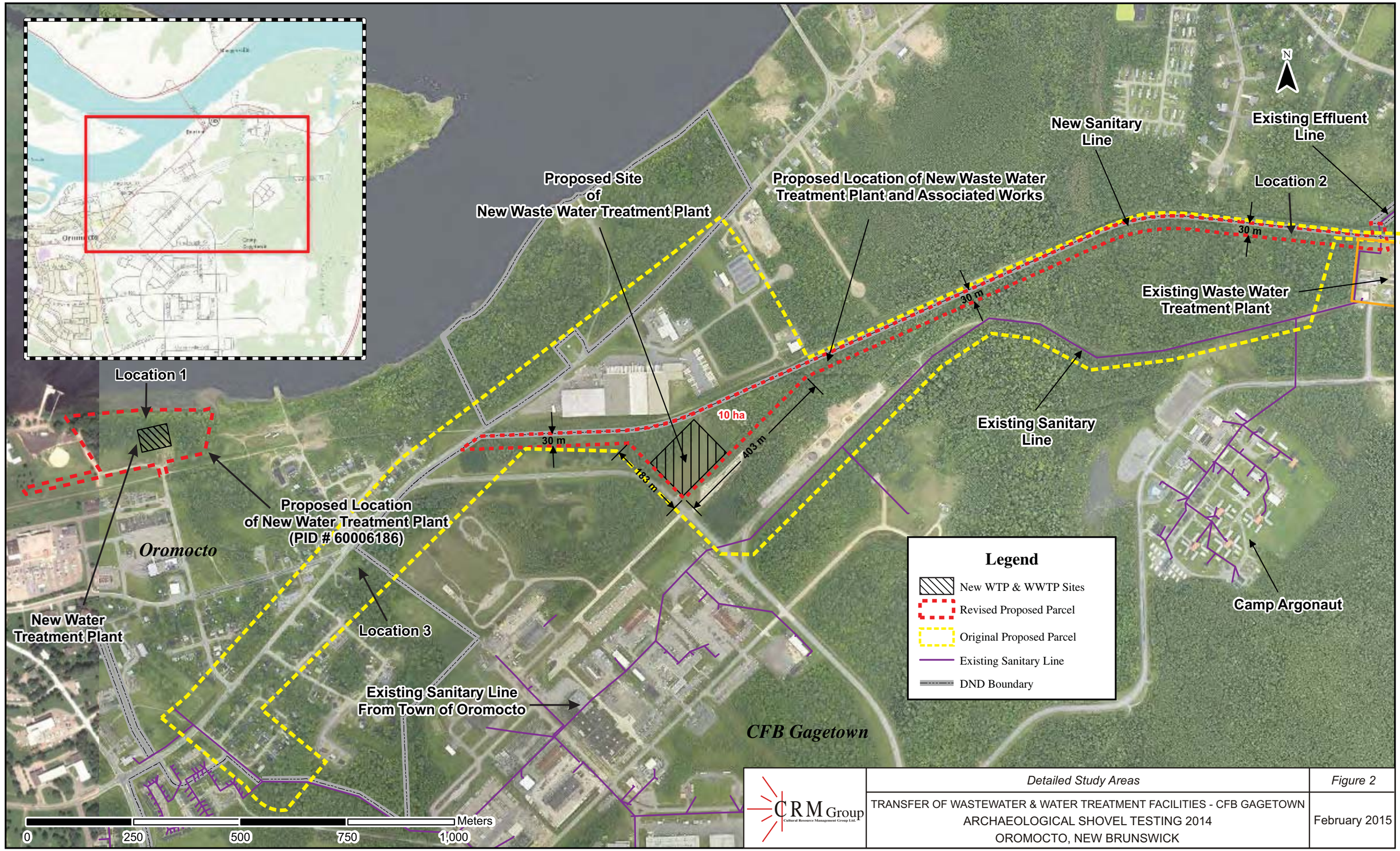
Cultural Resource Management (CRM) Group Limited was retained by Dillon Consulting Limited (Dillon) on behalf of DCC to perform a low-level field evaluation and, where required, conduct systematic subsurface testing, in the form of archaeological shovel testing, at three locations within the proposed water and wastewater facility study areas. These locations were identified as containing elevated archaeological potential during preliminary field investigations conducted in the spring of 2014 (Final Report for CFB Gagetown Transfer of Water Treatment Responsibilities Archaeological Impact Assessment 2014 under AFRP 2014NB1; and Final Report for CFB Gagetown Transfer of Wastewater Treatment Responsibilities Archaeological Impact Assessment 2014 under AFRP 2014NB2). Based on the low-level evaluation, and the planned application of horizontal directional drilling during construction, limited subsurface testing was conducted at only one of the three locations. A revision of the wastewater treatment plant study area removed one other location from consideration for further archaeological investigation (***Figure 2***).

The field evaluation and shovel testing was conducted by CRM Group Archaeologist Robert Shears with the assistance of Archaeological Technician, Kyle Cigolotti. Technical oversight for the project was provided by W. Bruce Stewart, CRM Group President and Senior Technical Advisor.

The archaeological investigation was conducted on November 4-5, 2014, according to the terms of Archaeological Research Field Permit 2014NB104, issued to Shears through New Brunswick Archaeological Services Branch of the Department of Tourism Heritage and Culture. This report describes the low level evaluation and shovel testing of locations of elevated archaeological potential, presents the results of these efforts and offers cultural resource management recommendations.



CRM Group Cultural Resource Management Group Ltd.	*Approximate Study Area*	*Figure 1*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015 Scale 1:50 000



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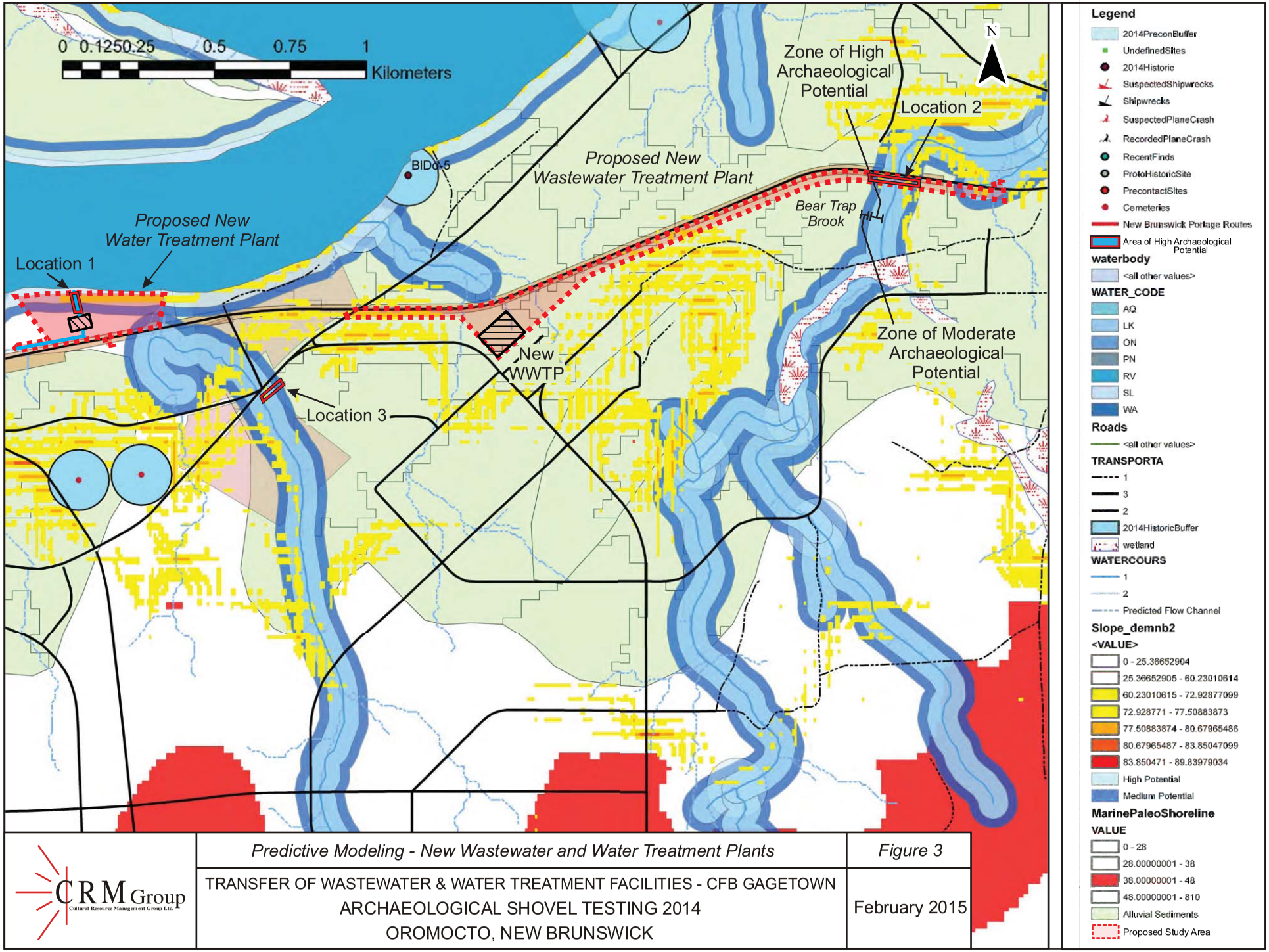
Detailed Study Areas	*Figure 2*
TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015

2.0 STUDY AREAS

Preliminary field investigations in Oromocto during the spring of 2014 identified three linear locations of elevated archaeological potential within the water treatment plant (WTP) and wastewater treatment plant (WWTP) study areas. Location 1 encompasses the section of proposed pipe alignment that crosses the south bank of the Saint John River and would potentially be impacted by the intake pipe of the proposed WTP site. Location 2 encompasses sections of pipe alignment on both banks of Bear Trap Brook potentially impacted by the outfall line of the proposed WWTP site. Location 3 encompasses the east bank of an unnamed watercourse southeast of the intersection of Waasis Road and Hiawatha Avenue (***Figure 3***). The locations of high archaeological potential constitute a combined study area of approximately 3,200 m^2. Following a low-level field evaluation of the locations of elevated potential, and the planned application of horizontal directional drilling during construction, limited subsurface testing was conducted at Location 1 only. Furthermore, Location 3 was determined to be outside of the project study area and was removed from consideration for further archaeological investigation.



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Predictive Modeling - New Wastewater and Water Treatment Plants | *Figure 3*

TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN
ARCHAEOLOGICAL SHOVEL TESTING 2014
OROMOCTO, NEW BRUNSWICK

February 2015

3.0 METHODOLOGY

DCC is scheduled to transfer responsibilities for the supply and treatment of water and wastewater from CFB Gagetown to the town of Oromocto (***Figure 1***). Due to the potential of encountering historically and/or archaeologically significant resources associated with Precontact and/or historic Native or early Euro-Canadian land use at the proposed sites, DCC required the services of a consulting archaeologist to undertake a comprehensive archaeological impact assessment prior to construction of the facilities and related infrastructure.

CRM Group Limited was retained by Dillon on behalf of DCC to perform a low-level field evaluation and, where required, conduct systematic subsurface testing, in the form of archaeological shovel testing, at three locations within the proposed water and wastewater facility study areas. These locations were identified as containing elevated archaeological potential during preliminary field investigations conducted in the spring of 2014. Based on the low-level evaluation, and the planned application of horizontal directional drilling during construction, limited subsurface testing was conducted at only one of the three locations. A revision of the wastewater treatment plant study area removed one other location from consideration for further archaeological investigation (***Figure 3***).

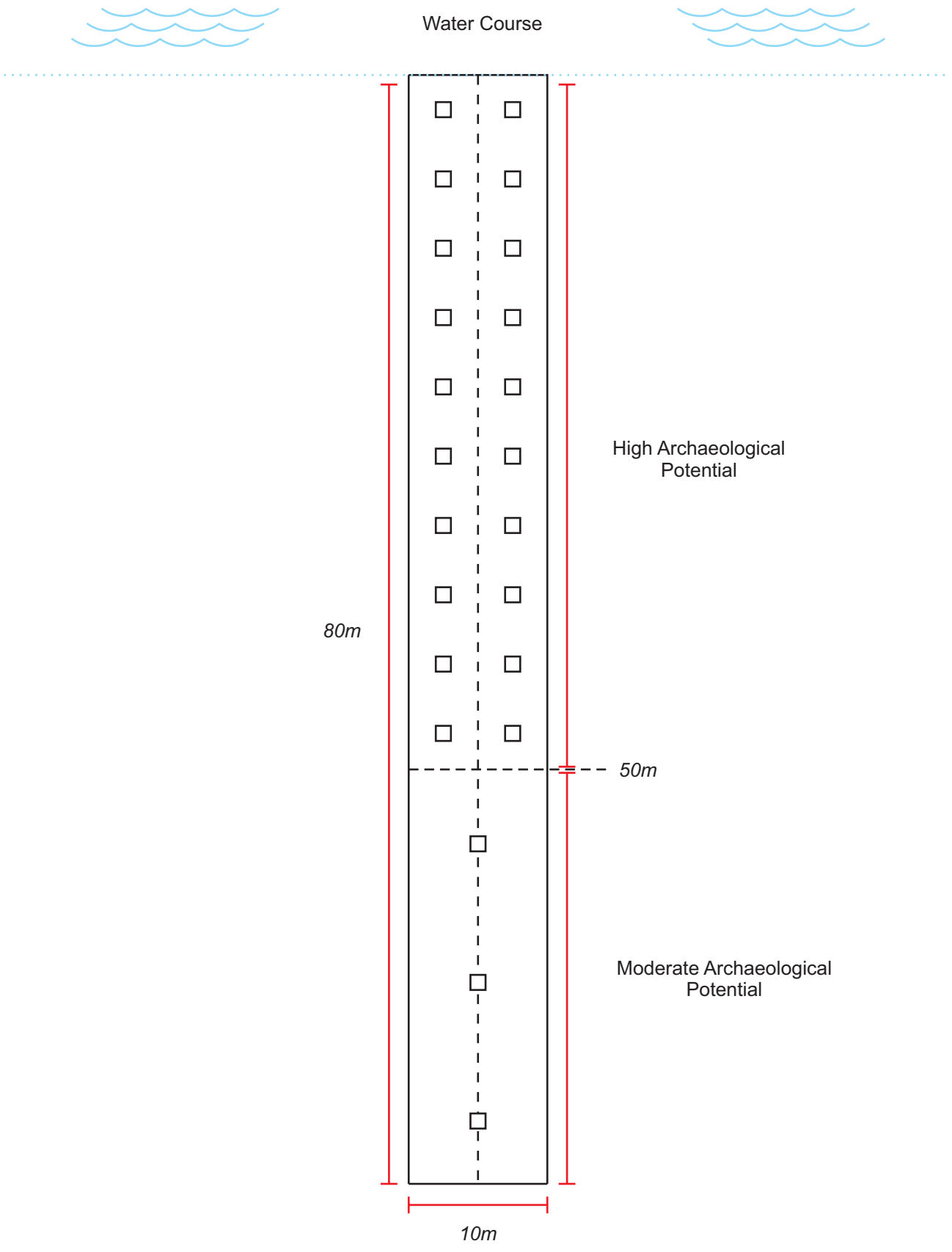
3.1 Low-Level Field Evaluation

The goal of the low-level field evaluation was to assess the condition of the locations of elevated potential identified during preliminary field investigations. This evaluation included a review of the surficial geology and local topography within the proposed pipeline alignment corridor. The evaluation helped determine the most appropriate resource management strategy. Visual assessment of the locations of elevated potential was conducted using mapping data of the proposed WTP and WWTP pipeline infrastructure alignments. The field examination was documented in the form of field notes and photographs. Waypoints were recorded with handheld Global Positioning System (GPS) units.

3.2 Systematic Subsurface Testing

The location selected for subsurface testing constituted a study area of ~800 m^2, assuming a construction corridor width of 10 metres. For the area of high archaeological potential, which includes land within 50 metres of the banks or shores of a current or former body of water, systematic subsurface testing would be performed within the proposed trench alignments in the form of two rows of shovel tests, in a 5 metre grid. For areas of moderate archaeological potential, which includes the area between 50 metres and 80 metres of the banks or shores of a current or former body of water, systematic subsurface testing would be performed within the proposed trench alignments in the form of a single row of shovel tests, in a 10 metre interval ***(Figure 4)***.

Shovel test pits averaging 50 centimetres square were dug to a depth of 1 metre, at which point manual excavation becomes impractical. An evaluation of the soil column was made in consultation with NB Archaeological Services to determine an appropriate resource management strategy. All soil removed from the test pits was screened through 6 millimetre wire mesh in order to standardize artifact recovery from within the excavated soil. The stratigraphy of at least one wall of each test pit was recorded on a Shovel Test Pit Recording Form. Shovel test locations were recorded using GPS technology and tape measurements off a baseline. All field activities were recorded for future interpretation. Unit designations were based on the southwest corner of each shovel test unit.



CRM Group Cultural Resource Management Group Ltd.	*Shovel Testing Methodology*	*Figure 4*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2014 Scale 1:400

4.0 RESULTS

4.1 Background Study

The study areas for the WTP and WWTP lie within the watershed of the Saint John River and are bordered by the mouth of the Oromocto River, approximately 250 metres to the west. These watercourses were extensively used as transportation routes in Precontact and historic times (Ganong 1899; Raymond 1910; Washburn and Gillis 1994). These rivers lie within Wolastoqiyik territory and bear names in their language. The Wolastoqiyik word for the Saint John River is "Wolastoq", meaning "Beautiful River", and is the word from which the people derive their name. The Oromocto River's name is derived from the Wolastoqiyik word "Welamoktuk", meaning "good river for easy canoe navigation" (Hamilton 1997; LeSourd 2007:17). The banks of the Saint John and Oromocto rivers have been inhabited by First Nations peoples for thousands of years. There are 33 registered Precontact or multi-component (Precontact and Historic) archaeological sites within 6 kilometres of the study area, which date from the Palaeo-Indian (> 9000 BP) to Maritime Woodland (3000 BP - 500 BP) Periods (***Figure 5***). Most of the sites lay along the banks of the Oromocto River, with five sites located near or along the Saint John River. The site nearest to the study areas (BlDo-4, the Bull Frog Site) is a multi-component (Precontact and Historic) site, located approximately 500 metres to the west. This site was recorded in 1974 by archaeologist Pat Allen and is located on the northern bank at the mouth of the Oromocto river east of the abutment to a historic bridge (New Brunswick Archaeological Services). Historian W.F. Ganong recounts how in 1841 "at the mouth of this river [Oromocto], near the bridge, was an Indian burial ground, and probably here was an Indian campsite" (Ganong 1899:227; Ward 1841:40). It is unknown if these reports refer to the same location or bridge.

The Saint John River Valley was first settled by Europeans with the arrival of the French in the late seventeenth century. The Seigneury at Oromocto, which included a tract of land on either side of the Saint John River, was granted to Mathieu d'Amour, Sieur de Freneuse. An estate, which included a "house, barns, etc.", is indicated on a Franquelin map from 1686 (***Figure 6***). A census from 1698 lists 36 settlers in the settlement of Freneuse (Ganong 1899:271). A British report from 1762 estimates the size of cleared land at Oromocto:

> ...the first real Settlement is about 60 miles above the Fort [at Saint John], where the River Remucta [Oromocto] falls into the River St. Johns: here I'm told there is about 300 acres of clear Land, chiefly on the River Remucta, which I did not see. (Bruce to Belcher, 1762; Ganong 1899:271).

Permanent British settlement began by 1763, following the Acadian Deportation (Washburn and Gillis 1994). By the early 1780s, and the arrival of Loyalist settlers to the Saint John Valley, "some forty-two families were scattered along the [Saint John] river, of whom several were at the mouth of the Oromocto" (Ganong 1899:326). Fort Hughes, a blockhouse fort named after Richard Hughes, Lieutenant Governor of Nova Scotia, was erected in 1780 at the mouth of the Oromocto River, west of the current water treatment plant. The American Revolution had begun four years earlier, thus the blockhouse was erected to protect the ever-increasing strategic importance of the Saint John River as a conduit of communication between Halifax, Quebec and New York (Ganong 1899:241; Raymond 1910:467). Lieutenant Constant Connor was commissioned to command the fort, which was active until 1783. Early land grant maps identify lots within the modern town of Oromocto including a grant of 100 acres issued to Lieutenant Connor, including the blockhouse site, for "Services as agent for the proprietors" (Connor 1785). This grant encloses the study area and extends across the mouth of the Oromocto River (***Figure 7***).

Legend

- Pre-Contact Site
- Historic Site
- Multicomponent Site
- Possible Burial
- Proposed Study Areas

N

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BIDo-2
BIDo-3
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Proposed New Water Treatment Plant

Proposed New Wastewater Treatment Plant

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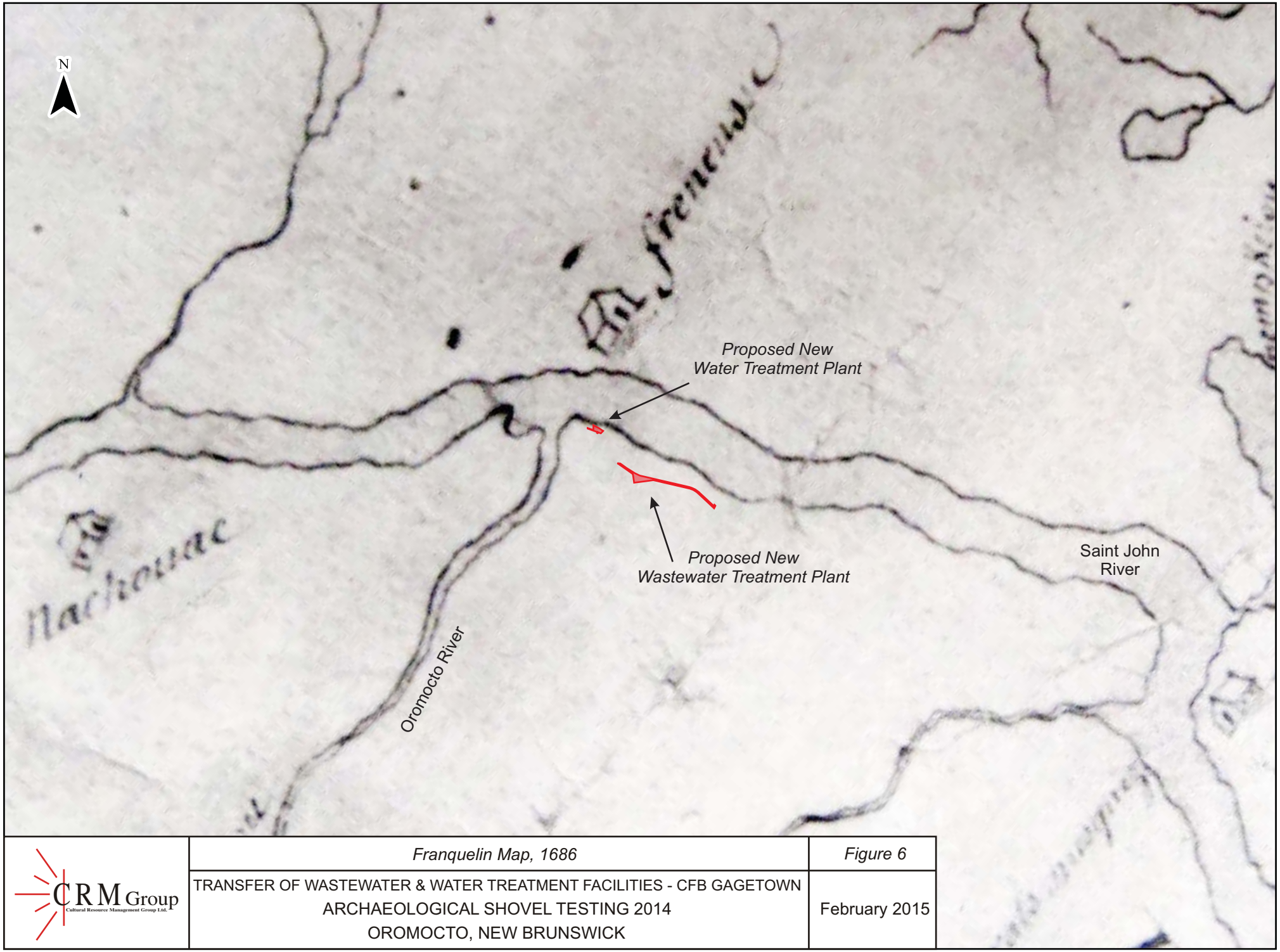
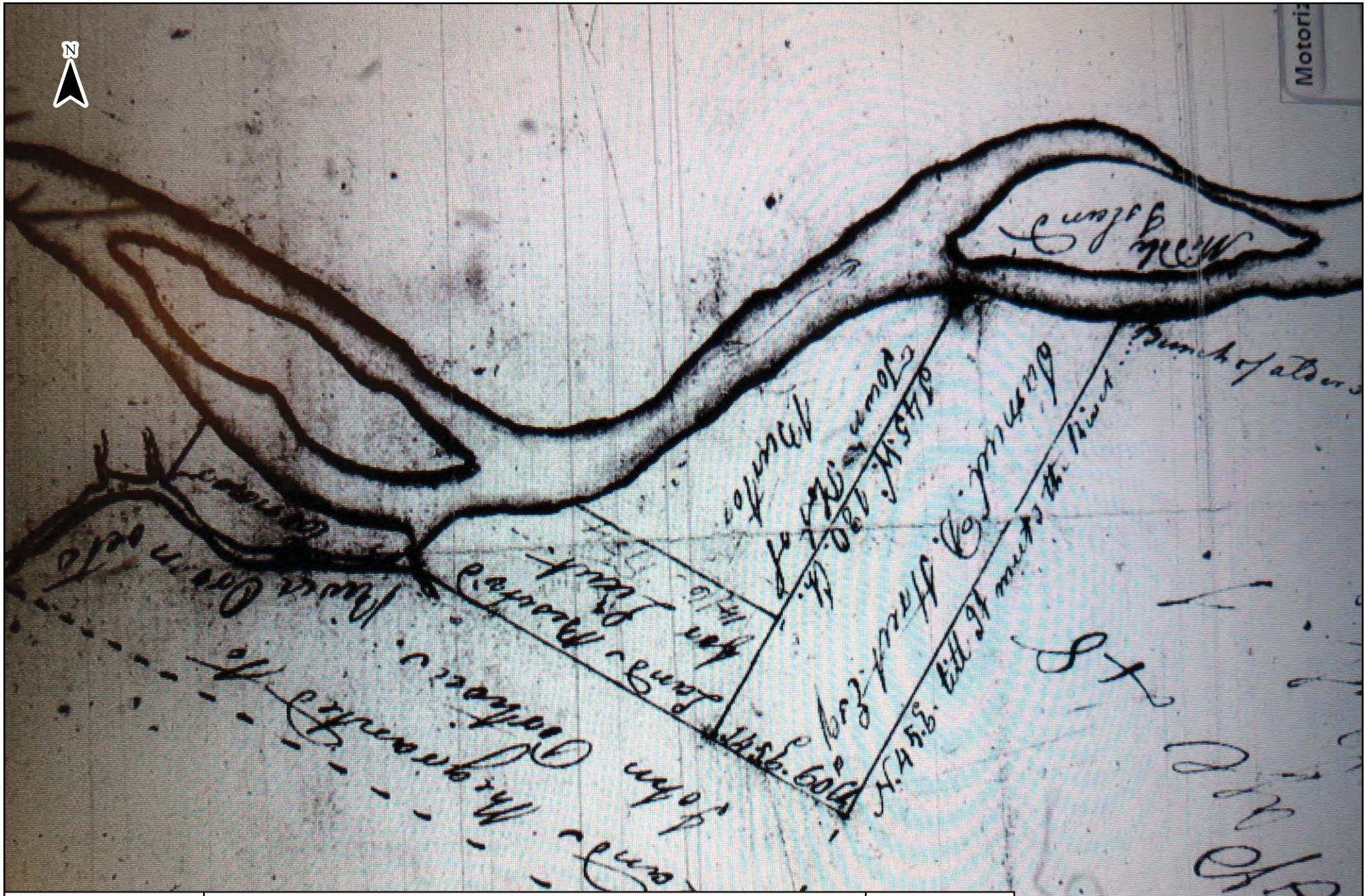
Registered Archaeological Sites in Relation to Study Areas	*Figure 5*
TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015 Scale 1:26 000



CRM Group Cultural Resource Management Group Ltd.	*Franquelin Map, 1686*	*Figure 6*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015



CRM Group Cultural Resource Management Group Ltd.	Oromocto Area Land Grant Map, 1784	*Figure 7*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015

By the end of the eighteenth century, the bank of the Saint John River in the vicinity of the study areas was dotted with habitations. A map of the area from 1799 shows numerous structures at Maugerville, on the north side of the river, with a road along the south bank that forked to cross the Oromocto River at two locations (***Figure 8***). The northern route, which is also lined by a number of structures, may follow the current alignment of Onondaga Street in Oromocto, bordering the WTP study area to the south and bisecting the WWTP study area.

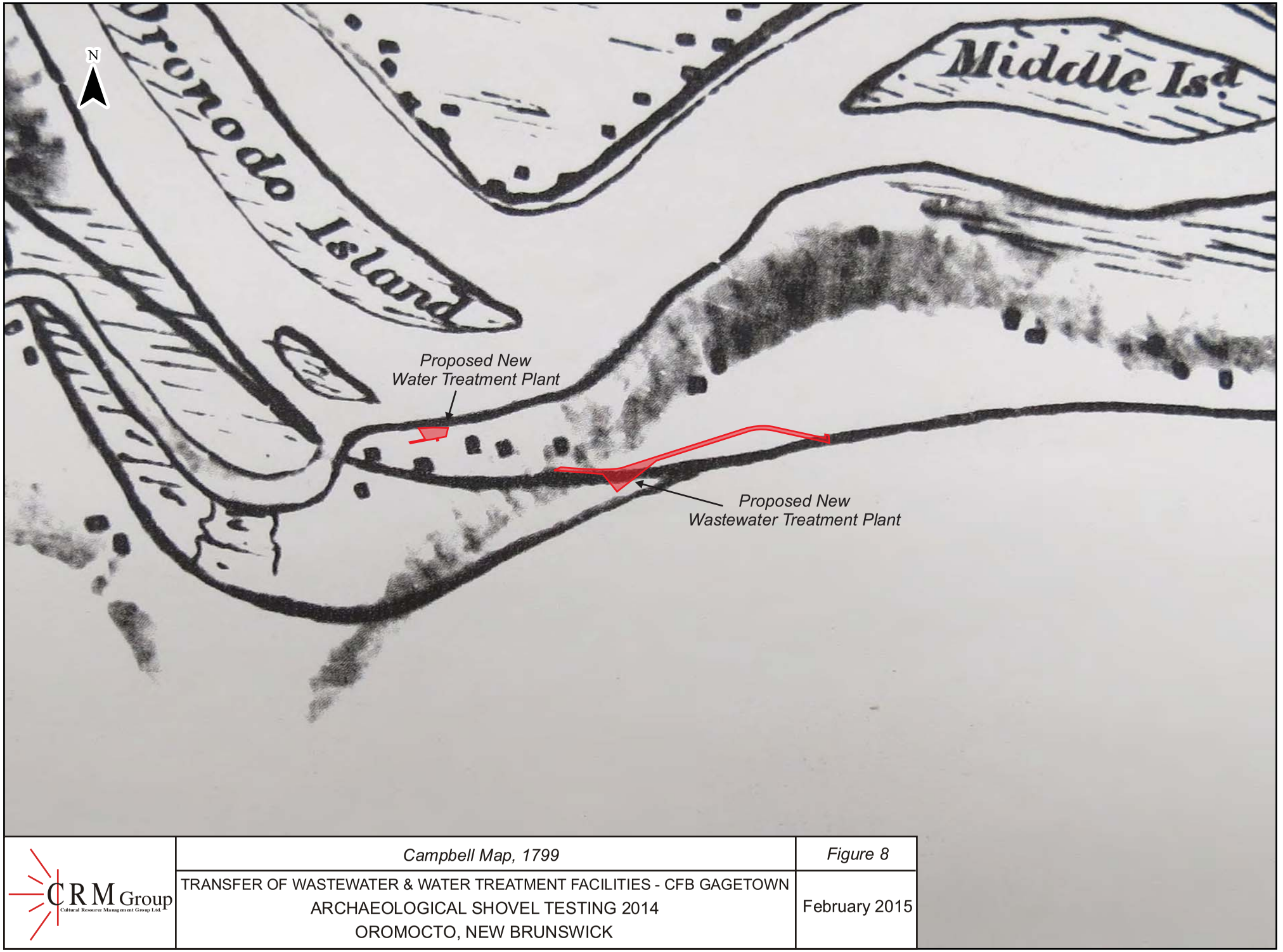
In the early nineteenth century, shipbuilding became an important industry at the mouth of the Oromocto River. By 1825, an Episcopal Church was built in what is now modern Oromocto (Fisher 1825:61). ***Figure 9*** is an 1846 map of the Saint John River, by William Fitzwilliam Owen. It shows roads passing along the Saint John River, south of the WTP study area and the Episcopal Church. Structures on this map that lie near the study area include the "Yett. Cottage on the Bank" identified in the map legend by the letter 'e'. The residence of a "Nevers" appears to the west of the WWTP study area. A review of aerial photography from the 1930s to the 1950s shows the larger WWTP site as covering a variety of wooded and residential areas (***Figure 10***). A lone building visible in photographs from 1934 and 1951 may be the structure identified in Figure 8 as the "Nevers" house. The field containing the house is now the site of a residential neighbourhood at Hiawatha Court and Mahsos Street in Oromocto.

The International Railway of Maine, subsequently incorporated into the Canadian National Railway, that ran between Lac-Mégantic, Quebec and Mattawamkeag, Maine, via Saint John, was constructed during the 1880s. In the early 1950s, the Canadian Government created CFB Gagetown, resulting in the expropriation of properties in the communities of Petersville, Hibernia, New Jerusalem and others. The village of Oromocto was re-designed as a planned town in preparation for the influx of service personnel. The population of Oromocto ballooned from 661 residents in 1956 to 12,170 by 1961. A review of aerial photography from 1934 shows the WTP study area as a cleared field, that by the 1950s had become largely overgrown (***Figure 10***). In the 1970-80s a petroleum bulk terminal stood on the WTP site. It, along with the railway, was decommissioned in the 1990s and the railway right-of-way has been developed as a recreational trail that extends along the southern border of the WTP study area and the northern border of the WWTP study area.

4.2 Surficial Geology

Location 1, within the WTP study area, lies within the Riverbank Series of soil types. Riverbank soils are typically found on well-drained slopes in river valleys. This soil type contains Holocene alluvial sediments overlying coarse-textured glacio-fluvial deposits and consist primarily of sand and gravel with some silt and minor amounts of clay and organic sediment. Riverbank alluvium is generally more than 2 metres thick and is deposited as channel and flood basin deposits. Riverbank soils are commonly yellowish brown to light olive brown, stratified and underlain at depth by heavily compacted lodgment till. The topsoil texture is either loamy sand or sandy loam (Washburn and Gillis 1994: 4-33) (***Figure 11***).

Soil at Location 2 falls within the Oromocto Series, which is a dark brown to black, poorly drained associate to Riverbank soils. As a result, the parent material is the same with slightly finer textures. Due to a permanently high water table, this soil develops as a humo-ferric podzol. Topsoil is underlain by a veneer of loamy lodgment till, minor ablation till, silt, sand and gravel generally 0.5 to 3 metres thick (Washburn and Gillis 1994: 4-34) (***Figure 11***).



CRM Group Cultural Resource Management Group Ltd.	*Campbell Map, 1799*	*Figure 8*
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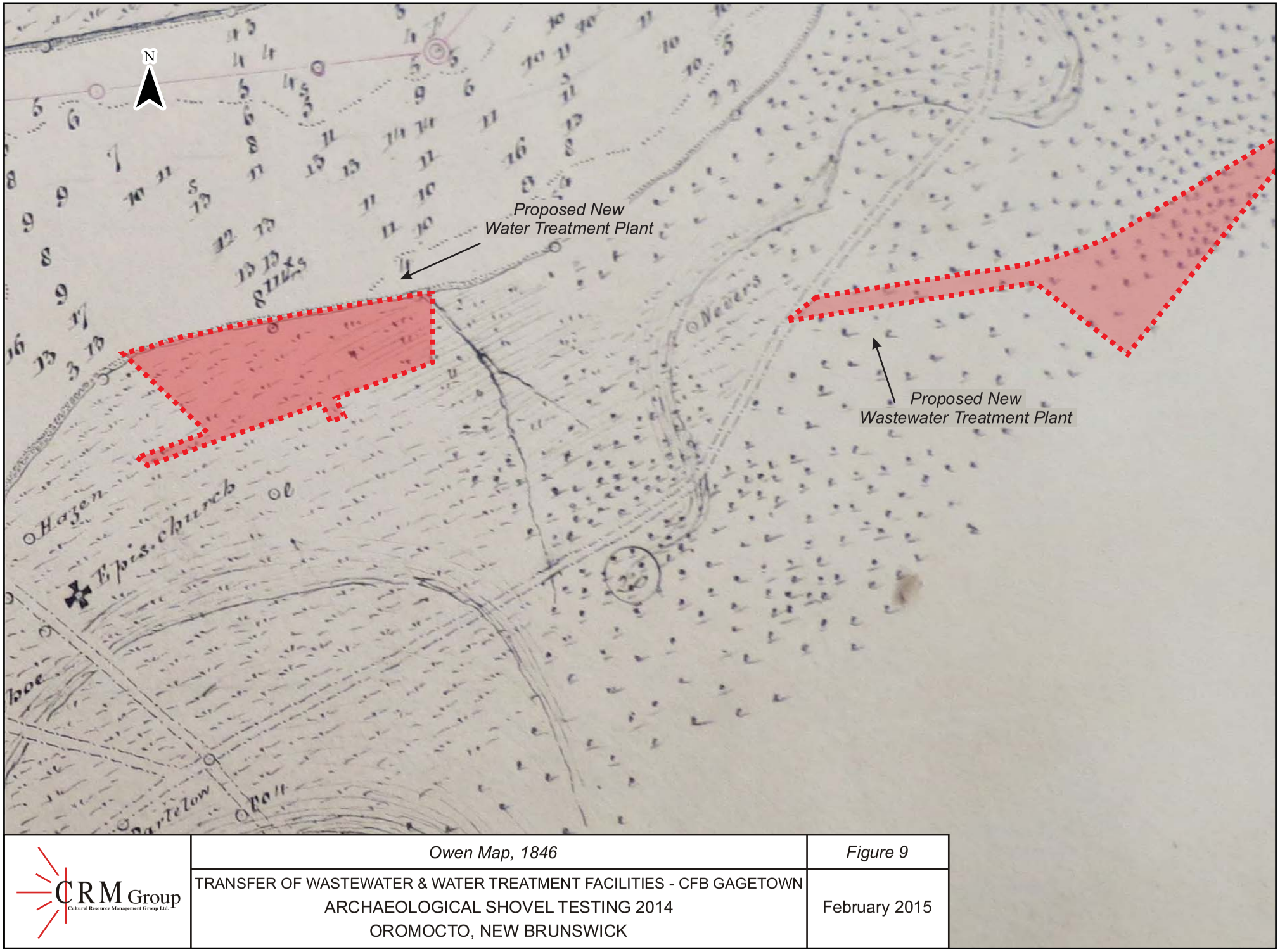

CRM Group Cultural Resource Management Group Ltd.	*Owen Map, 1846*	*Figure 9*
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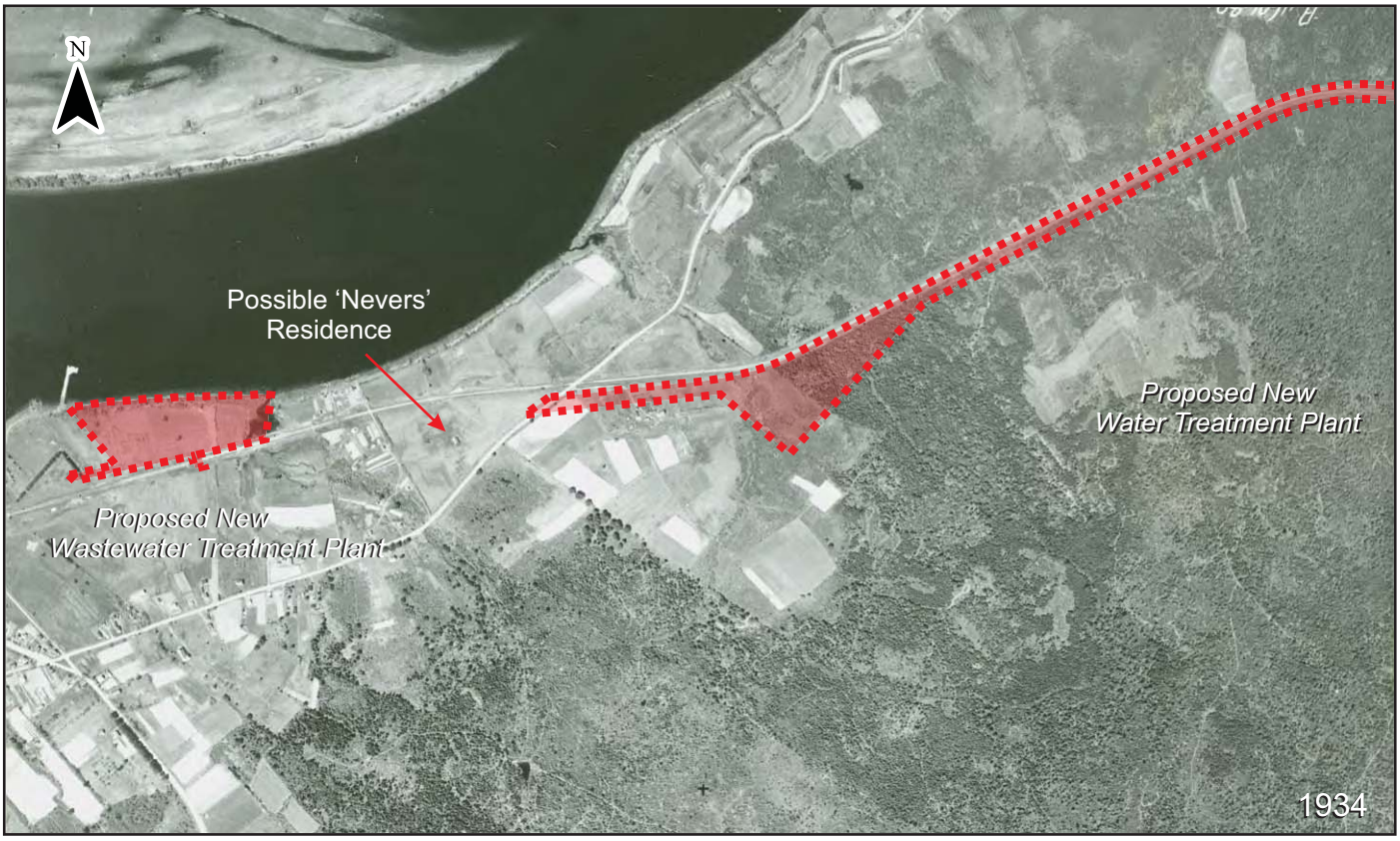
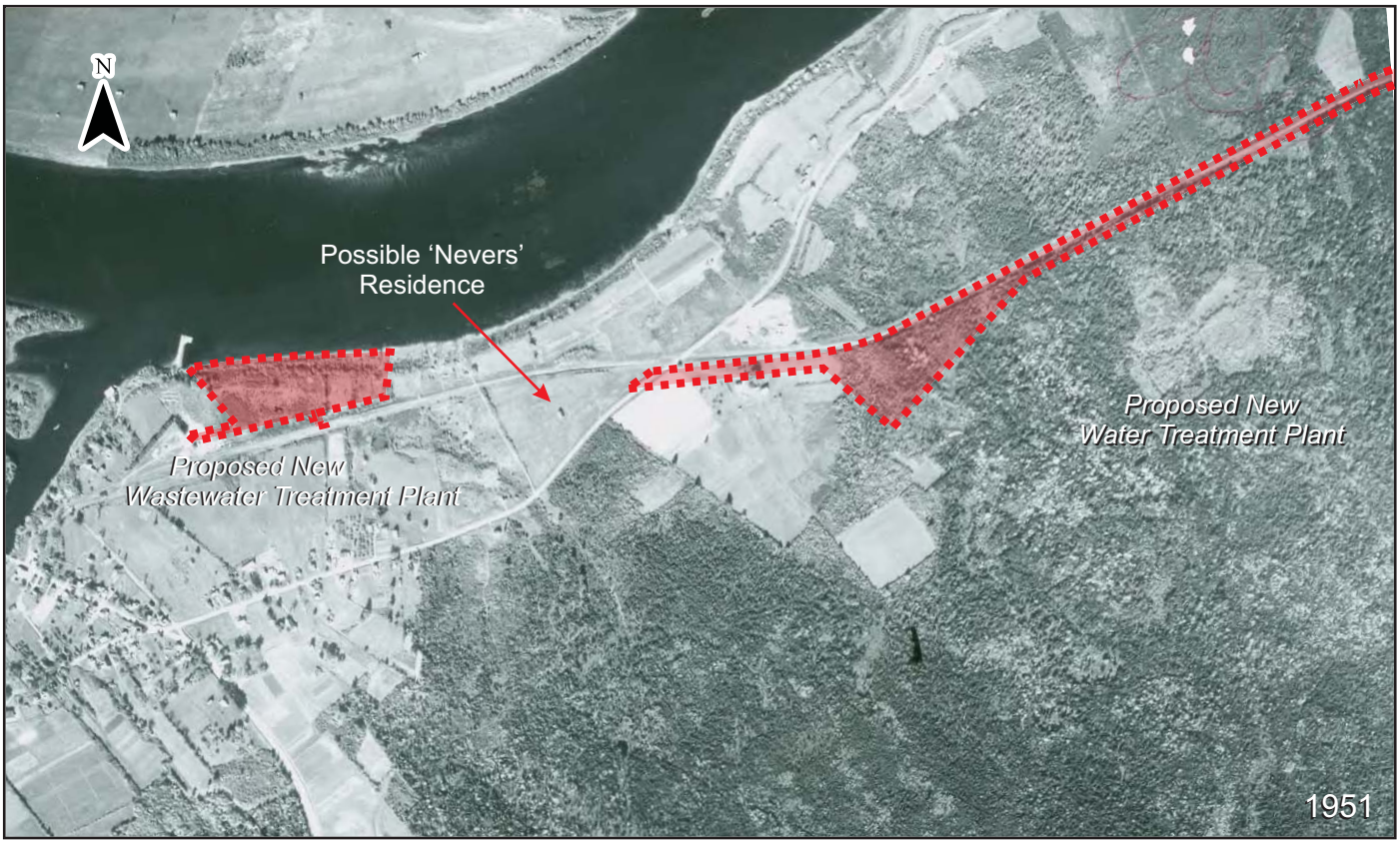
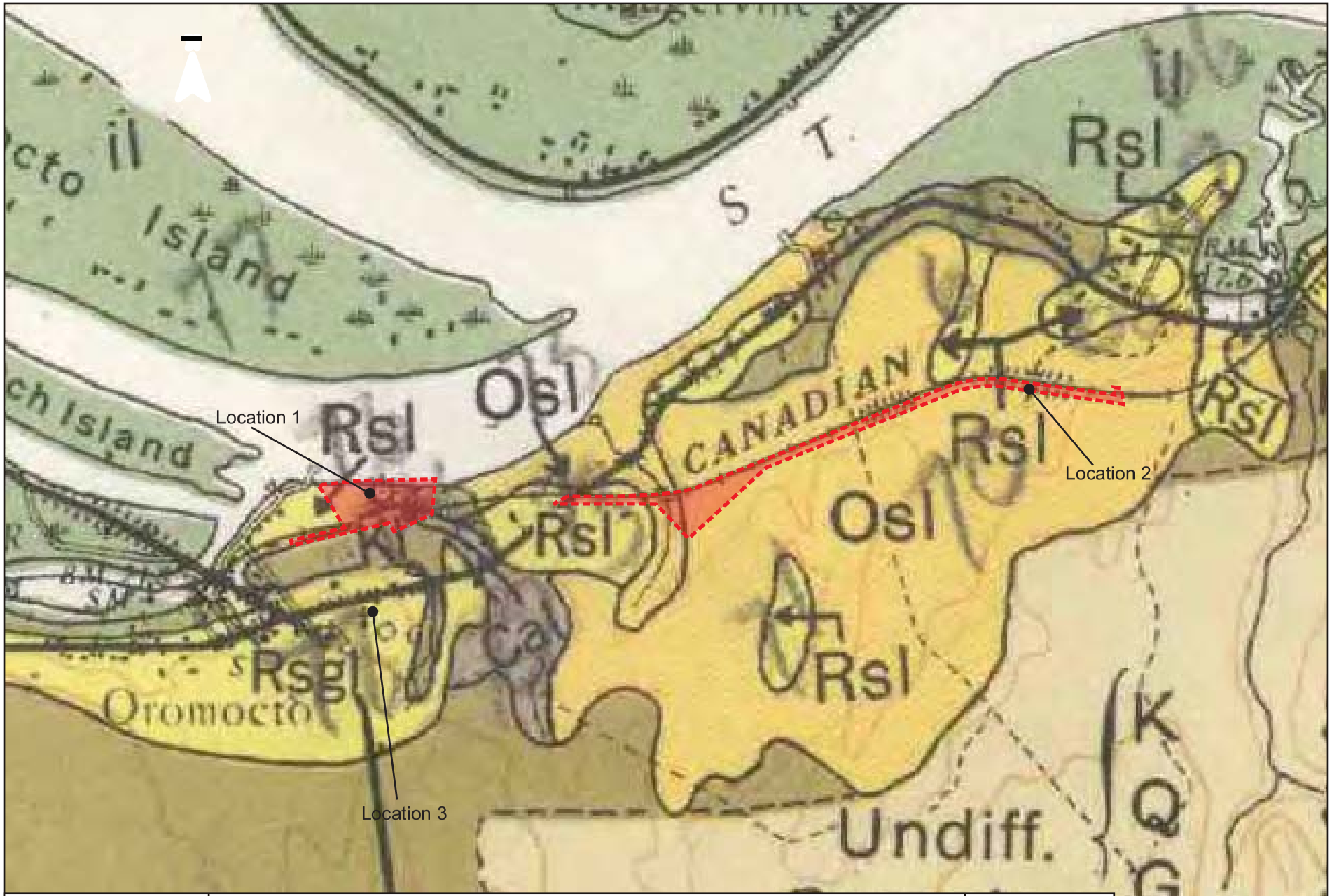




CRM Group Cultural Resource Management Group Ltd.	*Aerial Photographs, 1934 & 1951*	*Figure 10*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	*February 2014*



CRM Group Cultural Resource Management Group Ltd.	*New Brunswick Soil Survey Map, 1941*	*Figure 11*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	*February 2015*

4.3 Field Assessment and Shovel Testing

Location 1 - Water Treatment Plant Intake Pipe Alignment

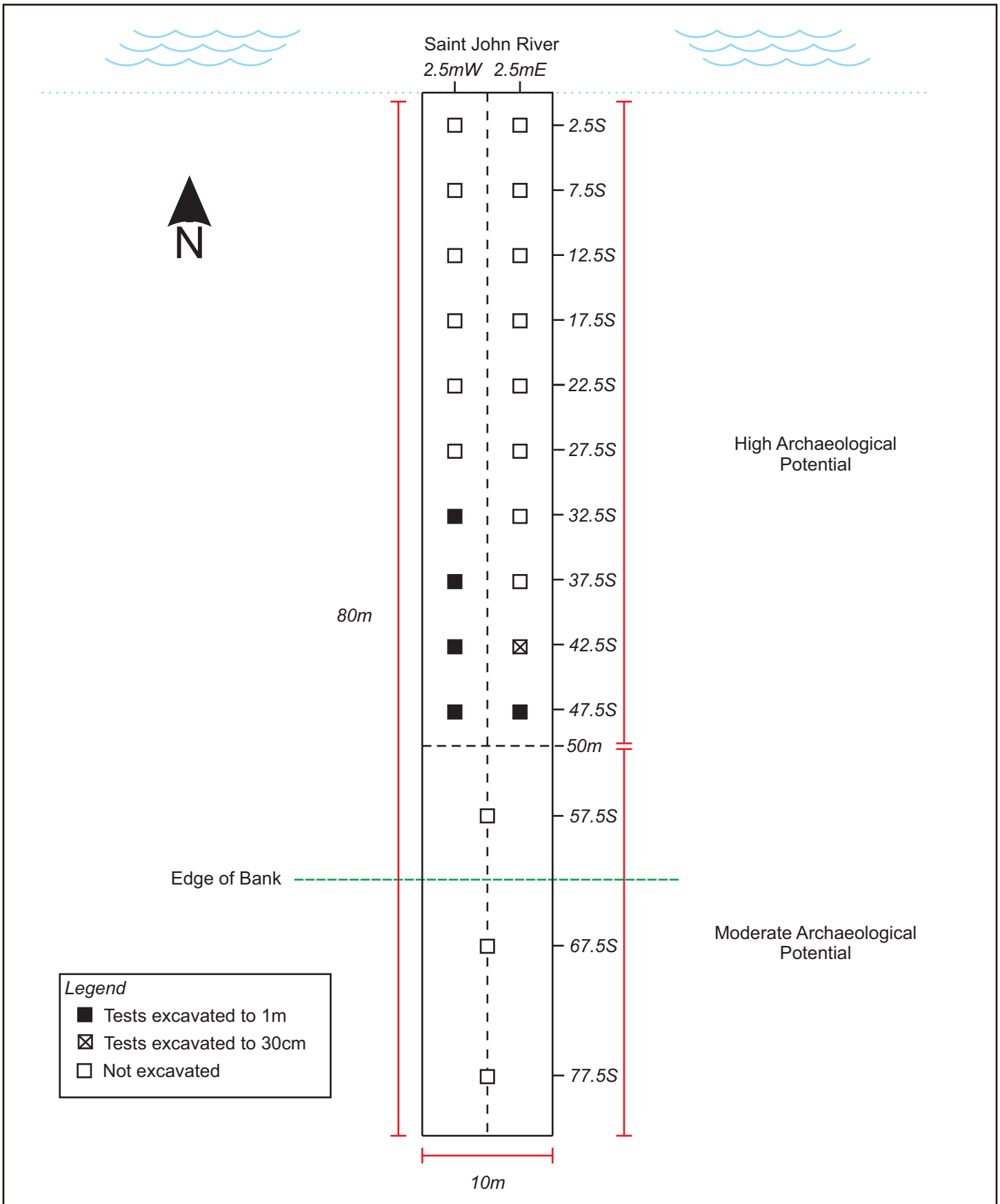
Predictive modeling for the Location 1 study area indicated zones of elevated archaeological potential, totaling 80 metres in width, extending back from the bank of the Saint John River. The first 50 metres from the river are ascribed high potential, while the following 30 metres are ascribed moderate potential.

Limited subsurface testing was conducted at Location 1 on November 4, 2014 under clear conditions. Shovel test locations were surveyed according to the outlined methodology, based on proposed pipeline alignment data from the preliminary field investigations conducted in May, 2014. The terrain was noticeably wetter proximal to the river's edge, with pools of standing water within the surveyed testing area. As a result, the southernmost, and therefore driest units within the zone of high potential, were selected for excavation (***Plates 1 & 2***).

Five shovel tests were excavated to a depth of 1 metre before being halted, as further manual excavation was impractical. The units excavated, from south to north, include: 47.5S/2.5W, 47.5S/2.5E, 42.5S/2.5W, 37.5S/2.5W and 32.5S/2.5W. A sixth unit, located at 42.5S/2.5E, was excavated to a depth of 30 centimetres before the end of the day (***Figure 12***). Despite the distance from the river, all units incurred an influx of ground water, from 10cm in Unit 47.5S/2.5W to 30cm in Unit 32.5S/2.5W, measured over a 2 hour period.

All units exhibited a similar soil column, which was comprised of a thin (~3cm) dark grey silt loam LFH layer, overlying a ~30cm thick greyish-brown sandy silt A-Horizon. The A-Horizon transitioned to an Ae-Horizon, which was a ~10cm thick light grey silty sand. Underlying the Ae was a yellowish-brown to dark yellowish-grey silty sand B-Horizon, that varied in thickness from 35cm to 50cm. Underlying the B-Horizon in units 47.5S/2.5W, 47.5S/2.5E and 42.5S/2.5W, at a depth of ~80cm below ground surface, was a purplish-brown sorted sand with pebbles of foreign stone. This layer was identified as a lacustrine deposit dating to 7,600 BP (Suttie, personal communication, 2014). The New Brunswick Archaeological Shovel Test Profile Forms containing profile drawings for the shovel tests are attached at the end of this report as Appendix A.

Director of Archaeology, Brent Suttie, and other staff from New Brunswick Archaeological Services visited the site and examined the excavation units. The units were determined to not have reached archaeologically sterile soil at a depth of one metre. The suspected depth of the alluvial deposit at the site (> 2.5 metres) also excluded the use of mechanical auguring (Suttie, personal communication, 2014). The soil conditions at Location 1 precipitated the decision by DCC to employ horizontal directional drilling during construction. The pipeline would be drilled to a depth of approximately ten metres with its entry and exit points outside of the zone of elevated potential.



CRM Group Cultural Resource Management Group Ltd.	*Location One Shovel Testing*	*Figure 12*
	TRANSFER OF WASTEWATER & WATER TREATMENT FACILITIES - CFB GAGETOWN ARCHAEOLOGICAL SHOVEL TESTING 2014 OROMOCTO, NEW BRUNSWICK	February 2015 Scale 1:400

PLATE 1: Edge of Saint John River at Location 1; facing northwest. November 4, 2014.

PLATE 2: Open shovel test units at Location 1; facing north. November 4, 2014.

Location 2 - Bear Trap Brook WWTP Outfall Pipe Alignment

A low-level archaeological assessment was undertaken at Location 2 on November 5, 2014 under clear conditions. Predictive modeling of the study area indicated a zone of elevated archaeological potential, totaling 160 metres in width, extending back 80 metres from the east and west banks of Bear Trap Brook. The first 50 metres on either side of the brook are ascribed high potential, while the following 30 metres on each side are ascribed moderate potential. Aside from the modern infrastructure of a railway bed, the topography surrounding Bear Trap Brook is level or gently sloping and relatively flat within the zone of elevated archaeological potential for the full length of the study area.

A review of the study area, which includes a 30 metre wide corridor across the 160 metre zone of elevated potential, included an examination of the surficial geology, local topography and cultural features. The study area included the former railway bed, now converted to a walking trail and a parallel corridor, approximately 10 metres south of the railway, for a buried transcontinental telegraph cable (***Plates 3 & 4***). In order to avoid disturbing these features, including potential archaeological resources, horizontal directional drilling will be employed during construction. The pipeline route will be installed beneath Bear Trap Brook and any associated archaeological deposits. The drilling entry and exit points will be made outside the zone of elevated potential, therefore no subsurface testing was conducted at this location.

PLATE 3: Bear Trap brook at Location 2; facing east. November 5, 2014.

PLATE 4: **Location 2 with former railway bed in the background; facing north. November 5, 2014.**

Location 3 - Unnamed Watercourse

An unnamed watercourse ascribed elevated archaeological potential on the predictive model map runs north-south, southeast of the intersection of Waasis Road and Hiawatha Avenue, approximately 90 metres northeast of Sacobie Boulevard. This watercourse had been identified as a location of elevated archaeological potential during the field reconnaissance conducted in the spring of 2014, but due to a revision of the WWTP study area, the location now falls outside the area of consideration for further archaeological investigation. Therefore, no subsurface testing was conducted at Location 3.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2014 archaeological field evaluation and shovel testing of the proposed water and wastewater treatment plant study areas consisted of a low-level evaluation of locations of elevated archaeological potential, as well as limited subsurface testing, in the form of archaeological shovel testing, at three locations that were identified as exhibiting elevated potential for encountering either Native (both Precontact and historic) or Euro-Canadian archaeological resources during preliminary field investigations conducted in the spring of 2014.

Location 1 encompasses the section of proposed pipe alignment that crosses the south bank of the Saint John River potentially impacted by the intake pipe of the proposed WTP site. Six shovel tests were conducted at this location, none of which contained artifacts or reached archaeologically sterile soil. Following a site visit by New Brunswick Archaeological services, shovel testing was halted. In order to avoid disturbing potential buried cultural resources, discussion with Dillon and DCC encouraged the use of horizontal directional drilling to facilitate the placement of the pipeline infrastructure. Location 2 encompasses sections of pipe alignment on both banks of Bear Trap Brook potentially impacted by the outfall line of the proposed WWTP site. Again, in order to avoid various modern features, as well as any potential buried archaeological deposits, horizontal directional drilling will be used during construction. Location 3 encompasses the east bank of an unnamed watercourse southeast of the intersection of Waasis Road and Hiawatha Avenue. A revision of the WWTP study area placed Location 3 outside of the study area, eliminating it from further archaeological investigation.

Based on these results, CRM Group offers the following management recommendations for the study areas:

1. Given the intended use of horizontal directional drilling, it is recommended that Location 1 within the proposed pipeline alignment be cleared of the requirement for further archaeological investigation.

2. Given the intended use of horizontal directional drilling, it is recommended that Location 2 within the proposed pipeline alignment be cleared of the requirement for further archaeological investigation.

3. In the unlikely event that archaeological deposits or human remains are encountered during construction activities associated with the water and wastewater treatment plant sites, all work in the associated area(s) should be halted and immediate contact made with New Brunswick Archaeological Services (Brent Suttie: 506-453-3014).

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APPENDIX A

SHOVEL TEST RECORD FORMS

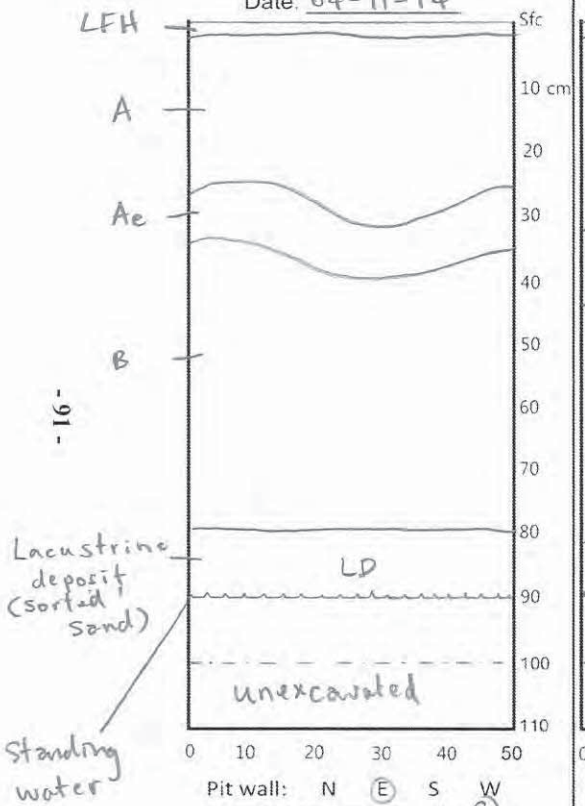
New Brunswick / Nouveau Brunswick

New Brunswick Archaeological STP Form

Permit No: 2014NB102 Test Site Designation: Location one - WTP Site

STP No.: 47.5S/2.5W

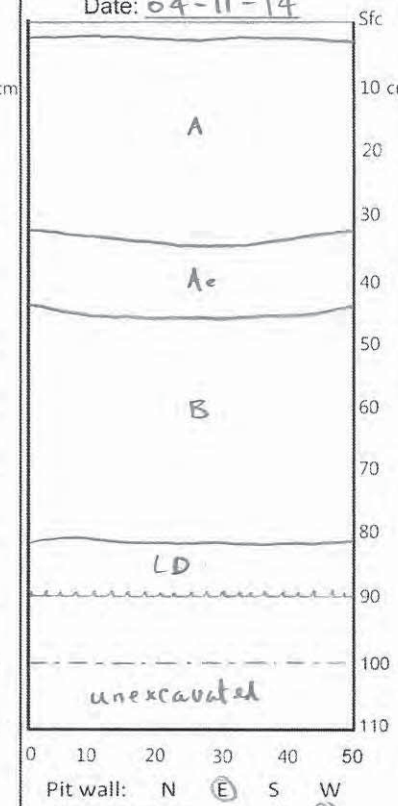
Date: 04-11-14



Pit wall: N (E) S W
Material recovered: Y (N)
WP: 190 Grid: NAD83
N 45 ° 51 ' 17.46"
W 66 ° 28 ' 12.64"
Photo:# Soil sample ☐
Notes: 35-Shears-14
Initials: RHJS

STP No.: 47.5S/2.5E

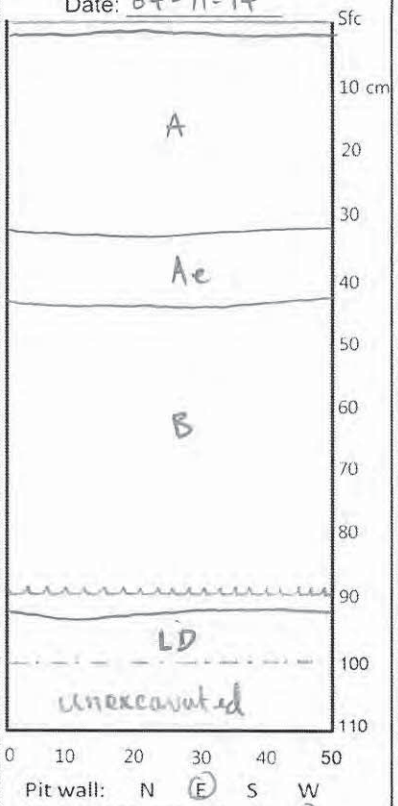
Date: 04-11-14



Pit wall: N (E) S W
Material recovered: Y (N)
WP: 191 Grid: NAD83
N 45° 51 ' 17.49"
W 66 ° 28 ' 12.41"
Photo:# Soil sample ☐
Notes: 35-Shear-14 - 36-Shears-14
Initials: RHJS

STP No.: 42.5S/2.5W

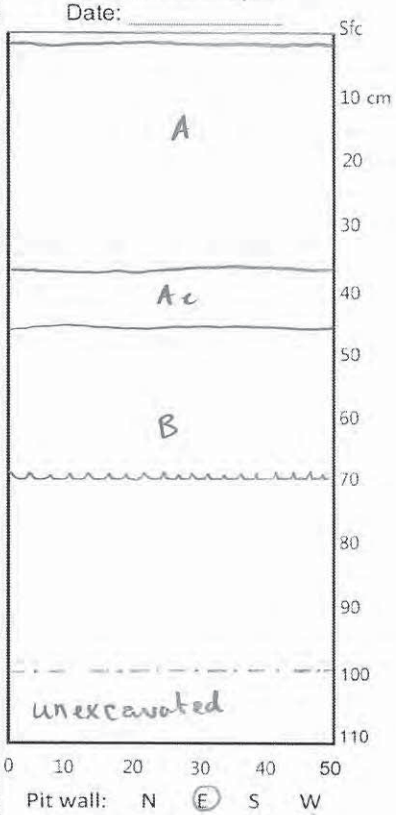
Date: 04-11-14



Pit wall: N (E) S W
Material recovered: Y (N)
WP: 192 Grid: NAD83
N 45 ° 51 ' 17.61"
W 66 ° 28 ' 12.70"
Photo:# Soil sample ☐
Notes: 36-Shears-14
Initials: RHJS

STP No.: 37.5S/2.5W

Date:



Pit wall: N (E) S W
Material recovered: Y (N)
WP: 194 Grid: NAD83
N 45° 51 ' 17.77"
W 66 ° 28 ' 12.74"
Photo:# Soil sample ☐
Notes: 36-Shears-14
Initials: RHJS

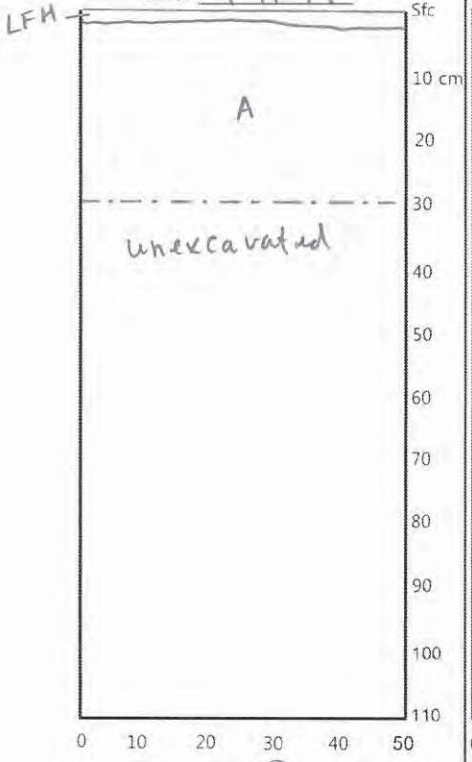
New Brunswick / Nouveau Brunswick

New Brunswick Archaeological STP Form

Permit No: 2014NB102 Test Site Designation: Location One-WTP Site

STP No.: 42.5S/2.5E

Date: 4-11-14



Pit wall: N (E) S W

Material recovered: Y (N)

WP: 193 Grid: NAD83

N 45 ° 51 ' 17.65 "

W 66 ° 28 ' 12.46 "

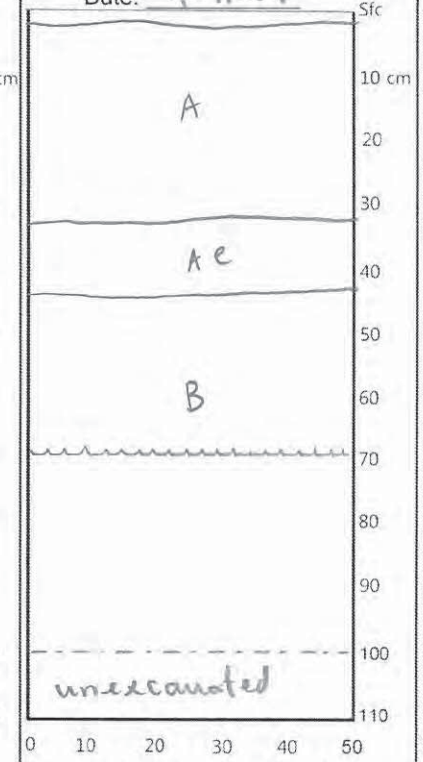
Photo:# _____ Soil sample ☐

Notes: 36-Shears-14

Initials: RHJS

STP No.: 32.5S/2.5W

Date: 4-11-14



Pit wall: N (E) S W

Material recovered: Y (N)

WP: 195 Grid: NAD83

N 45 ° 51 ' 17.93 "

W 66 ° 28 ' 12.80 "

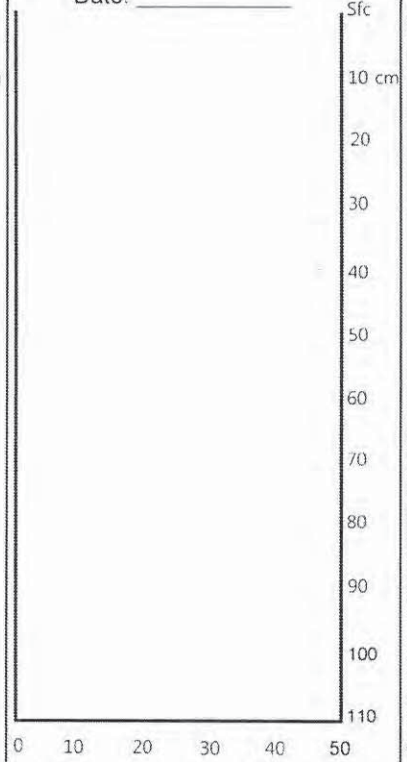
Photo:# _____ Soil sample ☐

Notes: 37-Shears-14

Initials: RHJS

STP No.: _____

Date: _____



Pit wall: N E S W

Material recovered: Y N

WP: _____ Grid: NAD83

N ___ ° ___ ' _____ "

W ___ ° ___ ' _____ "

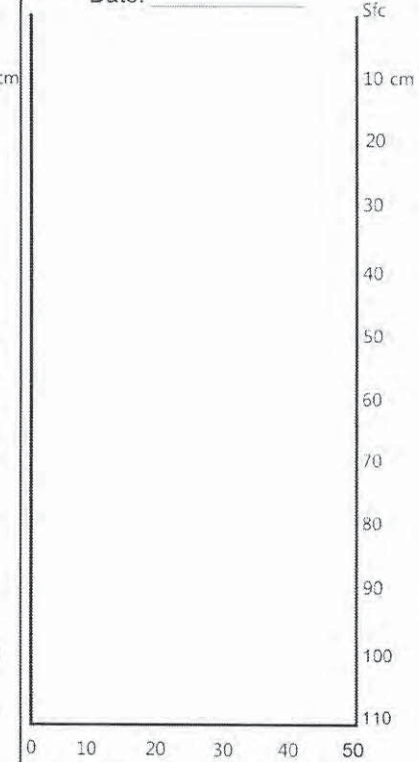
Photo:# _____ Soil sample ☐

Notes: _____

Initials: _____

STP No.: _____

Date: _____



Pit wall: N E S W

Material recovered: Y N

WP: _____ Grid: NAD83

N ___ ° ___ ' _____ "

W ___ ° ___ ' _____ "

Photo:# _____ Soil sample ☐

Notes: _____

Initials: _____