

Newfoundland
and Labrador
Refinery Project



**Environmental Impact Assessment
Component Study**

HISTORIC RESOURCES COMPONENT STUDY

Prepared For:
Newfoundland and Labrador Refining Corporation
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In Collaboration with
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July 2007

HISTORIC RESOURCES COMPONENT STUDY

SOUTHERN HEAD, PLACENTIA BAY, NL

Submitted To:

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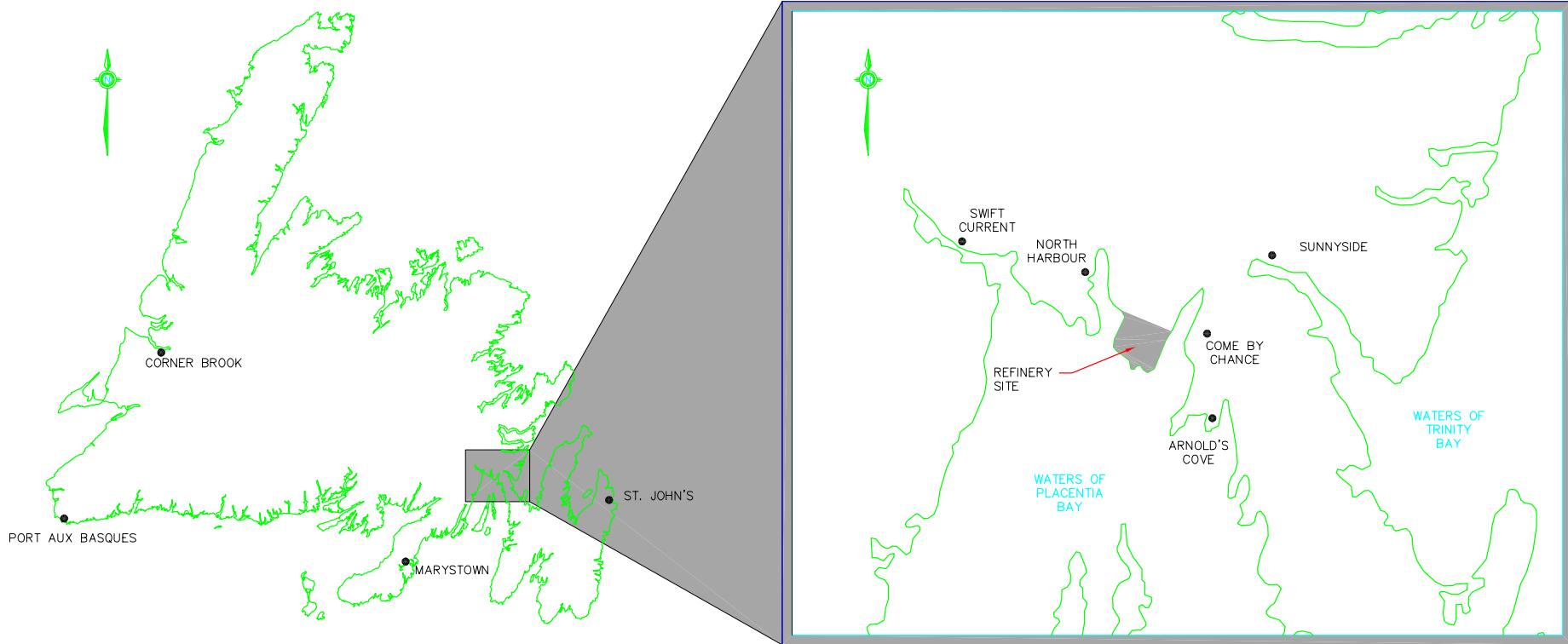
1 INTRODUCTION

1.1 PROPOSED PROJECT

Newfoundland and Labrador Refining Corporation is proposing to construct a new, privately financed, crude oil refinery at Southern Head, Placentia Bay (See Photo 1 & Figure 1). The refinery will include the process facilities, a marine terminal, crude and product storage tanks, and access roads and utilities. Site preparation is scheduled to commence immediately upon receipt of the required environmental approvals and necessary permits, which is anticipated to be by the end of calendar year 2007. Construction of the facility is expected to be completed within three years. It is anticipated that the refinery will begin production in early 2011.



Photo 1: Proposed Refinery Site



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HISTORIC RESOURCES ASSESSMENT
 LOCATION MAP



NEWFOUNDLAND AND LABRADOR
 REFINING CORPORATION

Scale: NTS

FIGURE 1

1.2 BACKGROUND

In October of 2006, Anvil Consulting completed a Stage 1 Historic Resources Assessment of the site selected for construction of a new oil refinery at Come By Chance Point at the head of Placentia Bay. Other than the remains of two vegetable gardens of possible late 19th or early 20th century origin discovered just outside of where project-related impacts could occur, no materials of historic resources significance were identified. Consequently, it was recommended in the Assessment report that if any Project infrastructure needed to be shifted to a point where impact with either of the sites could occur, details of the alterations should be provided to the Provincial Archaeology Office (PAO) of the Department of Tourism, Culture and Recreation so that determination could be made as to whether additional fieldwork was required (Anvil Consulting 2006).

In early 2007, Project plans were updated to include construction of a bridge across the North Harbour River. As well, the jetty proposed for Doughboy Cove was shifted south to a point where interaction with the site 01M/16 Ethno 02 identified during the 2006 Assessment was certain. As a result, the PAO required that additional field research be completed at three locations.

In June 2007, field research of the three identified locations was completed and this final report compiles the work completed during the 2006 and 2007 studies. The results of the two Assessments can be found in Section 5 – Study Outputs.

2 RATIONALE/OBJECTIVES

In 2006, subsequent to an evaluation of project details by the PAO, it was determined that due to the discovery of two archaeological sites in close proximity to the Project Area - one of which contained materials thought to be associated with a pre-contact¹ Aboriginal presence (Gilbert and Reynolds 1990) - a Stage 1 Historic Resources Assessment was required prior to commencement of any ground disturbing activities. The purpose of the Assessment would be to determine, through archival research and a field study, if other cultural remains were present in areas where Project activities would occur, and to recommend mitigation measures that would reduce or eliminate the likelihood of impacts.

In accordance with provincial guidelines, the objectives of the 2006 Stage 1 Assessment were to:

- Identify and assess the historic resources potential or sensitivity in the identified areas of concern; and
- Recommend the appropriate methodology and scope for further detailed impact studies in Stage 2, if indicated.

In early 2007, Refinery Project plans were updated to include a possible western access road from Highway 210 to the refinery site at Southern Head, which would involve construction of a bridge across the North Harbour River approximately 900 m upstream of the mouth. As well, the jetty proposed for Doughboy Cove was shifted south to a point where interaction with the site 01M/16 Ethno 02 identified during the 2006 assessment was certain. Subsequent to a review of the revised Project plans, the PAO required that additional field research be carried out at three locations. The areas identified for assessment included 3 areas:

- The shoreline at Doughboy Cove where it is proposed the jetty be constructed (Area 1);
- The site 01M/16 Ethno 02 situated on the west side of Doughboy Cove (Area 2); and

¹ Pre-contact refers to the period prior to the arrival of Europeans in North America and contact with Aboriginal people.

- Both sides of North Harbour River, from the mouth, upstream to the proposed bridge crossing (Area 3).

The PAO also requested that the shoreline of North Harbour adjacent to the river mouth be assessed, however, the exact distance on either side of the river was not specified.

As regards Area 2 - 01M/16 Ethno 02 - the primary objective of fieldwork at this location was to determine, through additional shovel testing and surface inspection (Stage 2), if other remains (such as a dwelling or outbuildings) were present on the site and what their association was with the vegetable garden identified in 2006 (Anvil Consulting 2006).

3 STUDY AREA

3.1 2006 STUDY AREA

In October of 2006, Roy Skanes of Anvil Consulting completed the field component of the Stage 1 Assessment, focussing on a number of key locations identified by the PAO for investigation. The locations identified for assessment by the PAO included:

- The right of way (ROW) on both sides of the banks of the come By Chance River at the proposed bridge location;
- The proposed road ROW from UTM 5304250 N and 0276400 E to 530115 N and 0272950 E;
- The proposed road ROW from 5299150 N and 0720850 E to 5299000 N and 0720650 E;
- The project area from Holletts Cove (including Holletts Cove Shoreline) to the proposed dock at Doughboy Cove;
- The refinery footprint; and
- The transmission line route from the refinery footprint to UTM 5300150 N and 0720850 E (See Figure 2).



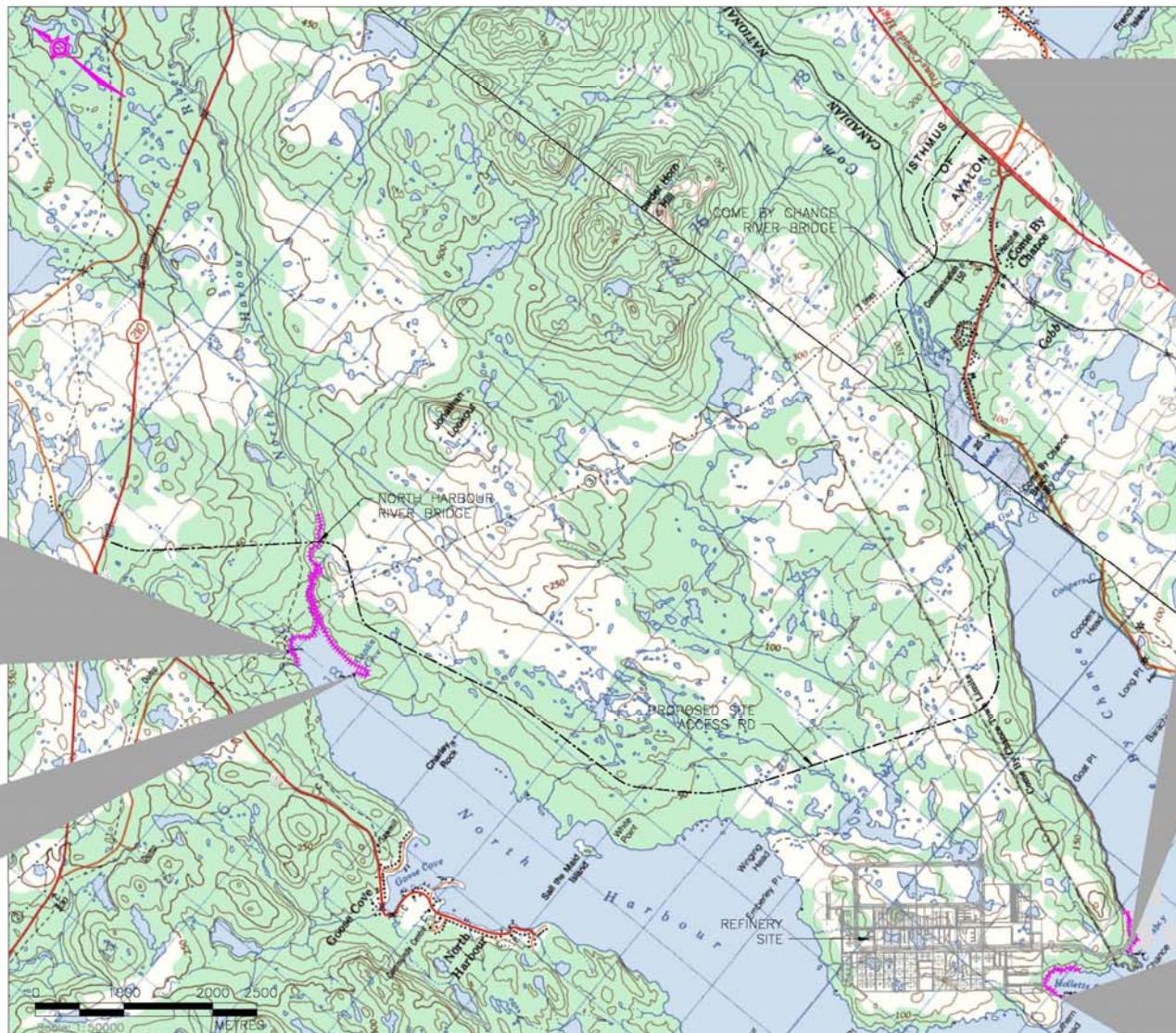
3.2 2007 STUDY AREA

3.2.1 Area 1

Area 1 is situated to the northeast of Come By Chance Point in Doughboy Cove and extends northeast along the shoreline for a distance of approximately 360m (See Figure 3 below). The section of shoreline selected for construction of the jetty is extremely steep-sided and rocky, but with several pockets of narrow beach at the base. With the exception of the small clearing at Doughboy Cove where the vegetable garden 01M/16 Ethno 02 is situated, the topography of the shoreline is such that at the upper edge of the narrow beaches the cliff rises steeply for approximately 10 m, with virtually no open and level ground beyond the inter-tidal zone that could conceivably be occupied. Moreover, at the top of the cliff, the terrain is irregular and heavily wooded. It is also wet in places and exposed to wind, as evidenced by the amount of uprooted trees (blow-down) in the area. Photo 2 below shows a typical section of shoreline where the jetty will be constructed.



Photo 2: Typical Section of Shoreline at Area 1



CABLE STATION

Scale: 1:10000



ETHNO 02

Scale: 1:10000



FIGURE 3



3.2.2 Area 2

Area 2 - the site 01M/16 Ethno 02 - is situated on the west side of Doughboy Cove in a raised and level meadow approximately 8 m above the high-water line (See Figure 3). The site consists of a number of raised vegetable beds in an approximately 10 m x 6 m clearing overlooking a narrow beach (See Photo 2).



Photo 3: Raised Vegetable Beds at Area 2 - Site 1M/16 Ethno 02

3.2.3 Area 3

Area 3 includes both sides of North Harbour River, from the mouth upstream approximately 900 m to where the bridge-crossing for access road to the refinery will be constructed (See Figure 3). The Assessment of this area involved a visual inspection of both riverbanks, which in all locations, even at the crossing itself, are extremely steep-sided and high, with few, if any, locations suitable for human occupation. The section of the river assessed is relatively shallow and rocky, particularly at the mouth where there are large concentrations of boulders and small

cobble islands. As a result of these conditions, travel by boat or canoe would be extremely difficult, especially during the times of year when the water is low (See Photo 4).



Photo 4: View of North Harbour River Looking Upstream Toward Bridge-Crossing

3.2.3.1 CIAM-01 (*North Harbour 1*)

Also assessed as part of Area 3 was the shoreline of North Harbour on both sides of the river (See Figure 3). On the east side, at approximately 130 m from the mouth, shovel testing resulted in the identification of what appear to be early 20th century remains, including fragments of ceramics and glass (Wicks 2003). The site - registered with the provincial Archaeological Site Record Inventory as CIAM-01 - is situated on a well-defined, dry terrace measuring approximately 15 m E-W x 10 m N-S, and is between 6 and 7 m above the beach (See Photo 5).



Photo 5: CIAm-01. The Site is Situated on the Terrace Just Back From the Beach

3.2.3.2 CIAm-02 (North Harbour 2)

Approximately 800 m to the south of the river mouth on the west side, a second historic site - CIAm-02 - was identified on an open, sandy point of land that is listed on the current 1:50,000 topographic mapping as Caplin Cove, but is referred to by local residents as Frenchman's Nook (See Figure 3). Informant information suggests that in the early part of the 20th century (and possibly earlier) a large sawmill was in operation on the sandy flat that was owned and operated by a French-speaking individual or family (D. Slade: personal communication).



Photo 6: View of CIAM-02. The Site is Situated in the Foreground of the Photo

3.2.4 Other Assessment Areas

Even though Holletts Cove to the west of Doughboy Cove was assessed as part of the 2006 Historic Resources Assessment (Anvil Consulting 2006), because time was available during the current field program, a visual inspection and test-pitting was completed in the area immediately above the shoreline and at the location where a Seawater Pumphouse will be constructed (See Figure 3). No materials of significance were identified during this work, and the potential for such findings is low. This conclusion is based on the fact that the terrain throughout the wooded area back from the beach is uneven and extremely wet.

One other location identified as significant during the current Assessment is situated to the east of the Trans-Canada Highway, northwest of Sunnyside See Figure 3). The site, that at one time consisted of two buildings constructed as a Trans-Atlantic cable station, was apparently used briefly during the 1850s. Even though no fieldwork was conducted at the site, it's location is included to ensure that if any

Project infrastructure - such as an access road or overpass, for example - is required for that general area, it can be routed to avoid interaction with these remains

4

METHODOLOGY

In accordance with provincial guidelines, the assessment included:

- Background research and submission of an Archaeological Investigation Permit application;
- A field study;
- Preparation of the necessary reports.

4.1

BACKGROUND RESEARCH AND PERMIT APPLICATION

Background research involved a review of literature related to a number of previous archaeological surveys and excavations completed in the vicinity of the Placentia Bay Study Area. Sources examined included published and unpublished reports and documentary information on file at the PAO in St. John's and at the Centre for Newfoundland Studies, MUN. In addition, the Newfoundland and Labrador Archaeological Site Record Inventory and Site Record Forms at the PAO were examined to obtain details on any archaeological sites in the region. Other sources consulted included local histories and land and resource use studies. Prior to fieldwork, aerial photographs and NTS topographic maps were examined to identify any landforms or vegetation patterns that could indicate zones of historic resources potential. The archaeologist also spoke with individuals knowledgeable about land use in the area and whether or not any archaeological sites or artifacts were known to have been discovered within the boundaries of the Study Area.

The results of the background research indicated that at least two archaeological sites are registered with the province for the west side of Come By Chance Harbour in relative close proximity to the proposed road corridor to the refinery site. CkAI-01 (referred to as Come By Chance West), is situated on the west side of Come By Chance River close to where it drains into Come By Chance Harbour (Figure 2). The site consists of a number of rectangular and circular depressions, all of which appear to be the remains of European houses, outbuildings and root cellars. Based on the age of a small sample of artifacts retrieved from the site - including clay smoking-pipe fragments, refined earthenware, brick fragments and cut and wire nails - it was concluded by the researchers that the principal period of occupation occurred during

the 19th and early 20th centuries. As well, three large patinated chert flakes of Aboriginal origin indicated a precontact occupation of uncertain cultural affiliation (Gilbert and Reynolds 1989). The coordinates obtained from the mapping prepared for the proposed refinery indicate that CkAI-01 is situated well in excess of 200 m from the proposed road corridor.

The second site (CIAI-02, referred to as Come By Chance River West) is also situated on the western side of the Come By Chance River estuary, approximately 100 m south of the islands in the river and 50 m west of the beach. During the archaeological testing of the area in the 1980s, five test pits excavated on the point of land revealed a thin layer of charcoal directly below sod and humus. Artifacts recorded in association with the charcoal included wrought iron nails, fragments of roofing slate, refined earthenware and clear bottle glass. Based on the age of the materials, it was concluded that the site had also been occupied during the 19th and 20th centuries. However, no materials to suggest an Aboriginal presence were discovered (Gilbert and Reynolds 1989). The coordinates obtained from the project mapping indicate that CIAI-02 is situated at least 200 m from proposed road corridor.

Once the above outlined background research was completed, an Archaeological Investigation Permit application was drafted and submitted to the PAO for review.

4.2 FIELD STUDIES

4.2.1 2006 Field Study

The field study for the 2006 assessment consisted of an initial helicopter over-flight of the entire project area, followed by a ground survey involving a thorough visual inspection and walkover of all the areas of concern identified by the PAO. In any locations of particular interest from a historic resources viewpoint, subsurface shovel testing was carried out. Where appropriate, rows of test pits were excavated at either 5 or 10 m intervals along cut-lines and paths, any natural linear features such as terrace edges or the shoreline and on any dry, level areas suitable for human settlement. The number and location of all test pits was recorded. In areas where materials of interest were identified, only minimal shovel testing was conducted in order to make a determination of cultural affiliation, the time period involved and the

physical extent of the remains. By employing such methods, this eliminated any unnecessary site disturbance until appropriate mitigation measures were approved by the PAO. Photographs were taken of survey and subsurface testing zones and any sites or features of interest observed. All information regarding the nature and integrity of any finds was documented on Government of Newfoundland and Labrador Archaeological Site Record Forms.

In order to make best use of time in the field, the key coordinates of project infrastructure - such as the road and transmission line corridors - were calculated using current project mapping and entered into a hand-held GPS unit. Once on the ground, the survey team was then able to walk from point to point, excavating test pits and taking notes as required. Having the data entered into the GPS prior to commencing fieldwork helped ensure that the exact areas where infrastructure is proposed to be constructed were adequately assessed.

4.2.2 2007 Field Study

The 2007 field study involved a walkover and thorough visual inspection of all areas of interest identified for Assessment by the PAO, and subsurface shovel testing of any locations exhibiting particular potential from a historic resources point of view.

Where appropriate in Areas 1 and 2, shovel test pits were dug at either 5 or 10 m intervals along paths and natural linear features such as the shoreline and terrace edges, or on dry level ground suitable for human settlement.

At Area 3 (01M/16 Ethno 02), intensive shovel testing was conducted within the vegetable garden and in the surrounding wooded area to determine if other evidence of occupation, over and above that recorded in 2006, was present. The number and general location of all test pits was recorded and photographs were taken of survey and subsurface testing zones and any archaeological sites or features located. In areas where archaeological remains were discovered, only limited shovel testing was conducted so that a determination could be made of cultural affiliation, the time period involved and the physical extent of the remains. All information regarding the nature and integrity of the archaeological findings were documented on Government of Newfoundland and Labrador Archaeological Site Record Forms.

4.3

PREPARATION OF THE NECESSARY REPORTS

This report on the Assessment is prepared in accordance with provincial guidelines for archaeological research (Government of Newfoundland and Labrador 1992) and includes a discussion of the methods and techniques, a summary of all study results, and a plan showing each survey area and the location of all sites observed and recorded. Recommendations for mitigation and further studies are provided where indicated. Detailed bibliographic references for all sources and individuals consulted are included.

5 STUDY OUTPUTS

5.1 2006 FIELD STUDY RESULTS

Despite a thorough investigation of all areas of concern identified for assessment by the PAO, no materials or sites of historic resources significance were discovered at any location where mapping indicates project-related ground disturbance will occur. In the majority of areas assessed, the terrain consists of either bog or open tundra, or is hilly and heavily wooded (See Photo 1). Even along the majority of the coastal strip within the Study Areas where archaeological sites would typically be expected to occur, large segments of the shoreline are rugged and steep-sloped, with only a small percentage being comprised of usable beach space (See Photo 7). In summary, the conditions observed throughout the majority of the proposed disturbance areas would likely not have been considered attractive for human occupation.



Photo 7: Shoreline at Doughboy Cove, Come By Chance Point

Nevertheless, two vegetable gardens, possibly pre-dating the 20th century, were recorded along the shoreline just outside of the boundaries of where infrastructure for the refinery will be situated. Garden 1 - registered according to PAO requirements as 01M/16 Ethno 01 - is located on the southwest side of Holletts Cove, Southern Head, on a narrow point of land at least 400 m to the southwest of the proposed road corridor from the refinery to the new jetty (See Figure 2). The site consists of an alignment of raised and overgrown vegetable beds covering an area of approximately 8-10 m squared. Despite the excavation of 35 strategically positioned test pits across the grassy point, no artifacts useful for dating purposes were discovered. As well, no evidence of a structure or dwelling was unearthed (See Photo 8). However, it was reported that in the 1960s, the point of land was used seasonally by a fisherman from the area who had erected a small cabin on the site for temporary accommodations (Oakley Johnson: personal communication). Despite a thorough examination of the area, no evidence of the structure was located.



Photo 8: Raised Vegetable Beds, Southern Head (01M/16 Ethno 01)

The second site (01M/16 Ethno 02), is located on the west side of Doughboy Cove, approximately 80 m to the south of the proposed road corridor leading to the jetty from where the refinery will be constructed (See Figure 2). It too consists of a number of raised vegetable beds situated in a small clearing overlooking a narrow beach. Similar to the site described above, no datable archaeological materials or evidence to confirm that someone had occupied the point of land was noted (See Photo 9).



Photo 9: Raised Vegetable Beds, Doughboy Cove (01M/16 Ethno 02)

As regards the proposed bridge crossing of Come By Chance River, assessment of the shoreline upstream did result in the discovery of an alignment of large stones (See Photo 10). While there is a possibility that the structure is the remains of a fishing weir of undetermined age, the size of the stones - which would have been difficult, if not impossible, to manoeuvre into position without the help of a tractor or backhoe - cast doubt on this tentative interpretation. A subsequent investigation of the shoreline on the east side adjacent to where the stone structure runs close to the

bank revealed a low-standing concrete foundation thought to be associated with a pump station or a dam of some type used to increase the water volume in the river at that location (See Photo 11). Due to the proximity and apparent association of the two structures, and the relatively recent appearance of the stone formation in the river, it is concluded that it and the concrete foundation are related and contemporary, and probably do not exceed 50 years in age.

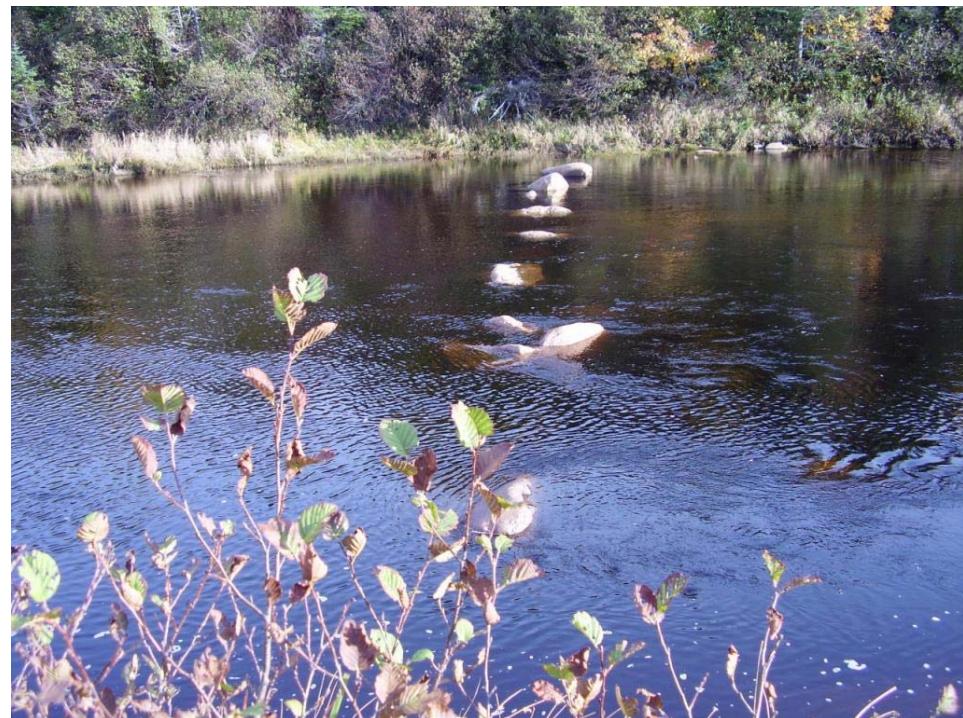


Photo 10: Stone Structure, Come By Chance River

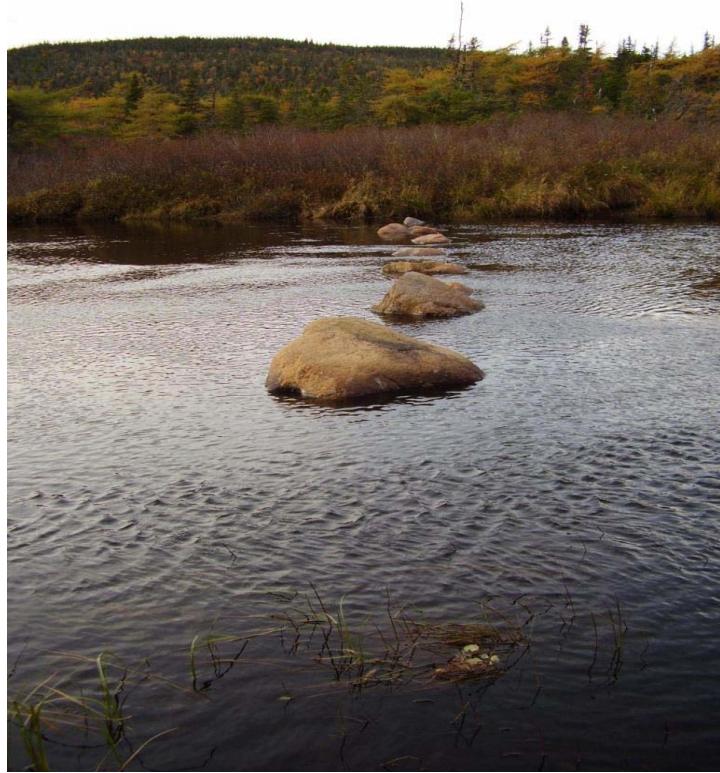


Photo 11: Stone Structure, Come By Chance River



Photo 7 – 2006 (Concrete Foundation, Shoreline of Come By Chance River)

5.2 2007 FIELD STUDY RESULTS

5.2.1 Area 1

Despite a thorough visual inspection and random shovel testing throughout Area 1 - where the Project jetty will be constructed - no materials of historic resources were located and the potential for such findings appears low. This is likely due to the topographic conditions, which include a steep-sided shoreline with hilly and wet terrain at the top, which are generally unsuitable for human occupation. As a result of these findings, no further research of Area 1 is recommended.

5.2.2 Area 2

Archaeological testing in 2006 at Area 2 - site 01M/16 Ethno 02 - failed to identify any artifacts (such as ceramics or glass) in the vegetable beds or in the surrounding wooded area (Anvil Consulting 2006). During the 2007 Assessment, intensive shovel testing was conducted throughout the clearing and in a number of open locations around its perimeter. Other than two fragments of clear bottle glass unearthed in one of the raised beds - one of which dates to the early 20th century (Wicks 2003) - no materials or structural remains were identified. It is concluded, therefore, that the site was used exclusively for small-scale vegetable production, with no associated structures built. These findings were not entirely unexpected, given that the only location in the cove where one could conceivably construct a tilt or outbuilding is where the garden is situated. In all other locations the ground is irregular and wet and exposed to onshore wind, as evidenced by the quantity of blow-down. Based on the evidence as described, it is concluded the area of Doughboy Cove investigated was used exclusively for vegetable production, with no accommodations or outbuildings constructed.

In accordance with provincial guidelines for historic resources (Government of Newfoundland and Labrador 1992), a number of options for resource management are available for the site. Included are:

- A Project redesign to avoid the impact; and
- Archaeological monitoring during the initial stages of construction to ensure no evidence or materials of significance are destroyed or lost.

Due to the recent date and commonplace nature of the site, the PAO may permit construction to proceed with no further assessment requirements. Due to the recent date and commonplace nature of the site, the PAO has permitted construction to proceed with no further assessment requirements.

5.2.3 Area 3

At one location within Area 3 - the banks of the North Harbour River, up to and including the proposed bridge crossing - no materials or sites of significance were identified, and the potential for such findings appears low. This is likely due to the topographic conditions, which include steep-sided banks that are extremely high. As a result, no further research is recommended for the area.

Along the shoreline of North Harbour on either side of the river - also considered part of Area 3 - two historic sites were identified (CIAm-01 and CIAm-02). However both sites are situated a significant distance from locations where Project infrastructure is proposed, no interactions are anticipated at this point.

5.2.3.1 CIAm-01 (*North Harbour 1*)

While not entirely certain, the pattern of vegetation and topography observed suggest that the terrace was farmed, and, unlike 01M/16 Ethno 02, the quantity and range of artifacts unearthed could indicate it was occupied over an extended period of time (Miller 1991). Due to the overview nature of the Assessment, only limited testing was completed, thus a thorough interpretation of the site is not possible at this point. Nevertheless, it is not unreasonable to assume that due to the sites proximity to the river (where fresh water and fish would have been available), its sheltered location and the presence of a pebble beach on which small craft could have been landed and deployed, there is a high probability that other, older historic remains are present. Moreover, it is possible that the terrace was also used by Aboriginal people prior to being occupied by Europeans. However, further field testing would be required to confirm the overall nature and extent of occupation.

Because of the location of the site on the west side of North Harbour River, no direct Project interactions are anticipated.

5.2.3.2 CLAm-02 (North Harbour 02)

At present, the ends of numerous wooden posts - which almost certainly served as supports for buildings - are visible protruding above the sand. Even though no discernable pattern as such was noted, it is apparent from the quantity and distribution of posts that, when in operation, the facility was clearly extensive and encompassed a large portion of the point. Shovel testing at the southwest end of the sandy area, and to the east of the beach where the remains of wharf ballast is visible in the intertidal zone, resulted in the discovery of several fragments of domestic ceramics that could date to either the late 19th or early 20th century (Miller 1991). These materials, and the fact that the location tested is slightly raised and dry, and covered in vegetation typically seen in areas where people have lived, suggest that this corner of the point was likely where accommodations were situated. Whether or not they were associated with the reported sawmill is uncertain, however, it seems likely they were.

As for the area between CLAm-02 and North Harbour River, assessment of this steep-sided and rocky shoreline failed to identify any areas of historic resources potential or materials of significance.

Due to the fact that the access road to the refinery will be situated at least 350m to the east of CLAm-02, no interaction with the site is anticipated.

5.3 CONCLUSIONS AND RECCOMENDATIONS

During the 2006 field surveys, despite a thorough investigation of all areas of concern identified for assessment by the PAO, no materials or sites of historic resources significance were discovered at any location where mapping indicates project-related ground disturbance will occur.

As a result of the findings from field surveys conducted in 2007:

- No further research of Area 1 is required;
- At Area 2, due to the recent date and commonplace nature of the site, the PAO has permitted construction to proceed with no further assessment requirements;

- No further research is required for Area 3;
- Along the shoreline of North Harbour on either side of the river - also considered part of Area 3 - two historic sites were identified, however no interactions are anticipated at this point.

As well, even though the stone structure located in Come By Chance River upstream of the proposed bridge crossing appears to be recent, if possible, it too should be avoided, as it could be the remains of a historic fishing weir. Being at least 125 m upstream of the proposed bridge crossing should provide an adequate buffer zone as is.

In a letter dated June 18, 2007 from the Provincial Archaeology Office, NLRC was advised that if 'there are no modifications to be made to the project as it stands now the PAO does not require further archaeological work to be carried out.'

PAO has recommended that if for any reason Project infrastructure needs to be relocated closer to the shoreline of North or Come By Chance harbours, or within 20 meters of the registered archaeological or ethnographic sites (including the 19th century cable station), details should be forwarded to the PAO for review.

As well, NLRC was directed that in the event of an inadvertent discovery of a historic or precontact artifact or archaeological site during any phase of Project development, all work in the immediate area of the find would be required to be halted and only resume once approval has been received from the PAO.

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Mr. David Slade Resident of North Harbour, Placentia Bay, NL.

PERSONNEL

All project management, research and report writing for the Stage 1 and Stage 2 Assessments was conducted by Roy Skanes of Anvil Consulting. Mr. Skanes has been involved in archaeological and archival research in the province of Newfoundland and Labrador since 1978, and since 1990 has completed several projects of similar scope and depth to the current undertaking. He has also directed research throughout the Maritimes, Quebec and Ontario, and worked for several years with Parks Canada's Archaeology Division in Ottawa, Memorial University's Archaeology Unit in St. John's, and for a number of local and mainland consulting firms.

Assistance during fieldwork was provided by Sam Horwood and Cliff Brown. The artifact Conservator for the project was Rose Smart.