



**Archaeological Overview Assessment (AOA) of Proposed Water Storage Facility
Replacements in the Village of Lions Bay**

Conducted under

Squamish Archaeological Investigation Permit 17-0162

and

Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2017-097

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Archaeological Overview Assessment (AOA) of Proposed Water Storage Facility Replacements
in the Village of Lions Bay, B.C.

Credits

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Management Summary

This report presents the results of the Archaeological Overview Assessment (AOA) of the proposed replacement of four potable water storage facilities in the Municipality of the Village of Lions Bay, B.C: the Harvey Tank; Phase IV Tank; Phase V Tank; and the Highway Tank. The AOA was conducted at the request of AECOM/Village of Lions Bay in order to determine the potential of impacting archaeological sites as a result of the proposed developments. The AOA was conducted under the provisions of Squamish Archaeological Investigation Permit 17-0162 and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2017-097. The study area is located within the asserted traditional territories of the Squamish, Tsleil-Waututh, and Musqueam First Nations.

The objectives of the AOA were to:

- Identify areas within the study area with the potential to contain archaeological sites;
- Prepare predictions regarding archaeological site distribution, density, and variability within the project area; and
- Recommend the need and appropriate scope of future archaeological research within the project area.

The AOA took place in accordance with the *British Columbia Archaeological Impact Assessment Guidelines* (Apland and Kenny 1998) issued by the Archaeology Branch at the former Ministry of Sustainable Resources and *Archaeological Overview Assessments as General Land Use Planning Tools – Provincial Standards and Guidelines* (2009). The AOA was not concerned with identifying traditional use sites as the identification of traditional use sites is beyond the scope of an AOA. The AOA was conducted without prejudice to First Nations treaty negotiations, aboriginal rights, or aboriginal title.

For the current project, the AOA involved:

- A review of the archaeological, ethnographic, and historic literature pertaining to the study area;
- A review of biophysical and topographic data concerning the study area;
- An evaluation of archaeological site potential; and
- A Preliminary Field Reconnaissance (PFR), or ground-truthing, of the study area to confirm or refute the archaeological site potential of the study area derived from the literature review.

Based on the literature review conducted as part of the AOA, past, ongoing, and future developments within the study area were rated during the pre-field assessment as having moderate to low potential to impact archaeological sites.

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The PFR of the study area took place on August 4, 2017 and consisted of a judgmental and systematic survey of the proposed developments. The field crew consisted of Chris Springer, M.A. (Arrowstone Archaeological Research and Consulting Limited), Kevin Rivers (Squamish First Nation), and Darrell Guss (Tsleil-Waututh First Nation). A representative of the Musqueam First Nation was unavailable to be part of the field crew.

The PFR was conducted: (1) to examine the terrain within the proposed development areas for landforms that might contain archaeological sites; (2) to look for evidence that supported or denied the potential evaluation made from the documentary research and the evaluations made from maps and air photos; and (3) to assess the amount of ground disturbance due to prior land altering activities and/or erosion within the proposed development areas. The results of the field assessment did not fully support the potential assessment derived from the documentary research, map, and air photo analyses.

The four proposed development locations are assessed as having low potential for impacting archaeological resources. This rating was as a result of the highly modified nature of the terrain encompassed by the four water tank facilities. Any archaeological sites that may have been present in the development area have been destroyed as a consequence of the original installation of the tanks and associated distribution system, and because the area has been logged at least once within the last 100 years.

As a result of the PFR and AOA, the potential of locating as-yet undiscovered archaeological sites is considered to be low at the four proposed water facility replacement locations. Accordingly, it is recommended that no further archaeological work is warranted for the proposed developments.

In the event that any unanticipated archaeological remains are discovered during construction activities, it is recommended that the proponent inform their personnel and all contractors of the following:

- Archaeological remains in the Province of British Columbia are protected from disturbance, intentional or accidental, by the *Heritage Conservation Act* (1994);
- In the event that archaeological remains are encountered, all activities which threaten the archaeological site(s) should be suspended at once; and
- It is the individual's responsibility to promptly advise the Archaeology Branch at the Ministry of Forests, Lands, and Resource Opportunities of the existence and location of the newly identified site(s). Mitigative measures or management options for the previously unidentified site(s) will be determined in consultation with the Archaeology Branch.
- It is further recommended that the Squamish, Tsleil-Waututh, and Musqueam First Nations be informed of any newly identified site(s).

This report provides background data regarding the context of the research in terms of its biophysical and cultural setting, describes the objectives of the research, describes the methods

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of the research, presents the results of the fieldwork, and provides recommendations regarding the need and appropriate scope of future archaeological research within the study area.

Acknowledgements

Arrowstone Archaeological Research and Consulting Limited (Arrowstone) would like to thank Nai Jaffer of the Village of Lions Bay and Graham Walker of AECOM for the opportunity to conduct this study. Arrowstone would also like to thank the Squamish, Tsleil-Waututh, and Musqueam First Nations for the opportunity to work within their asserted traditional territories. Arrowstone would also like to thank Kevin Rivers (Squamish First Nation) and Darrell Guss (Tsleil-Waututh First Nation) for their assistance and input during the preliminary field reconnaissance.

The opinions expressed in this document are those of the authors. The authors are solely responsible for its contents and any omissions and errors that it may contain. This report is intended for use by AECOM/the Village of Lions Bay to assess potential impacts to archaeological resources within the proposed development areas. The authors accept no responsibility for uses other than those intended and stated in this report.

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1.0 Introduction and Project Background

This report presents the results of the Archaeological Overview Assessment (AOA) of the proposed replacement of four potable water storage facilities in the Municipality of the Village of Lions Bay, B.C: the Harvey Tank; Phase IV Tank; Phase V Tank; and the Highway Tank. The AOA was conducted at the request of AECOM/Village of Lions Bay in order to determine the potential of impacting archaeological sites as a result of the proposed developments. The AOA was conducted under the provisions of Squamish Archaeological Investigation Permit 17-0162 and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2017-097. The study area is located within the asserted traditional territories of the Squamish, Tsleil-Waututh, and Musqueam First Nations.

The objectives of the AOA were to:

- Identify areas within the study area with the potential to contain archaeological sites;
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The AOA took place in accordance with the *British Columbia Archaeological Impact Assessment Guidelines* (Apland and Kenny 1998) issued by the Archaeology Branch at the former Ministry of Sustainable Resources and *Archaeological Overview Assessments as General Land Use Planning Tools – Provincial Standards and Guidelines* (2009). The AOA was not concerned with identifying traditional use sites as the identification of traditional use sites is beyond the scope of an AOA. The AOA was conducted without prejudice to First Nations treaty negotiations, aboriginal rights, or aboriginal title.

The assessment described in this report is concerned with the identification and management of archaeological sites. An archaeological site is any location that contains the remains of past human activity. Some examples of archaeological sites include habitation sites, stone tool manufacturing and maintenance sites, food storage or roasting pits, burials, fish weirs, rock art, Culturally Modified Trees (CMTs), and trails.

This report provides background data regarding the context of the research in terms of its biophysical and cultural setting, describes the objectives of the research, details the methods of the research, presents the results of the fieldwork, evaluates the research, and includes recommendations regarding the need and appropriate scope of further archaeological work within the study area.

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in the Village of Lions Bay, B.C.



Figure 1: NTS map showing the location of the study area and the approximate locations of the four water tanks (from map 92G/06; 1:50,000).

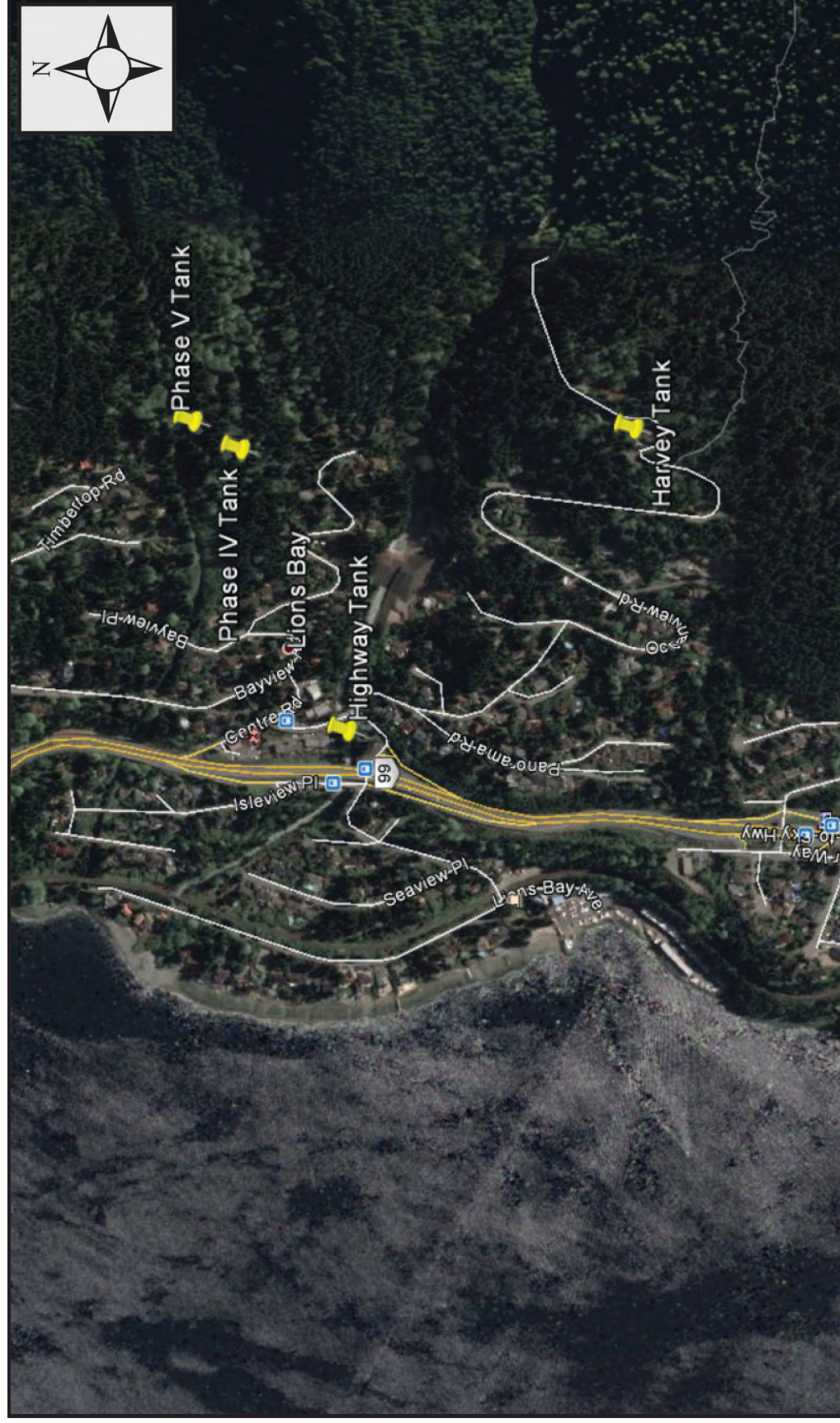


Figure 2: Google Earth image showing the locations of the four tanks within the Village of Lions Bay, B.C.

1.1 Definitions

An archaeological site can be defined as any location that contains identifiable physical traces of past human activities and/or behaviours. Many different types of archaeological sites may be found in the study area and more than one line of archaeological evidence may be present at these sites. The types of sites that may be found in the study area include village sites, temporary camps, lithic scatters, isolated finds, rock art sites (pictographs and petroglyphs), temporary shelters, lithic raw material quarry sites, burials, trails, and CMTs. The current AOA was not intended to identify areas in which no physical remains of past human activities can be found, such as berry picking sites and fishing locations, as the identification of these types of sites are more appropriately addressed in Traditional Use (TUS) and Traditional Knowledge Studies (TKS).

Archaeological sites that pre-date 1846 are automatically protected under the *Heritage Conservation Act (HCA)* whether on public or private land. Sites that are of an unknown age and that have a likelihood of dating to prior to 1846 (i.e., lithic scatters) as well as aboriginal pictographs, petroglyphs, and burials that are considered to have historical or archaeological value are also automatically protected. Sites that are protected under the *HCA* may not be altered, damaged, moved, excavated in, or desecrated in any way without a permit issued under Section 12 or 14 of the *HCA*.

Without Prejudice

The study area is located within the asserted traditional territories of the Squamish, Tsleil-Waututh, and Musqueam First Nations. Nothing in this report is intended to affect the scope or justify infringement of aboriginal title or rights or prevent the Squamish, Tsleil-Waututh, and Musqueam First Nations from exercising their aboriginal rights. This report is without prejudice to the positions any parties may assert in court proceedings or in treaty negotiations, and is not an admission of fact or liability for the purposes of such proceedings and processes. The archaeological investigations were undertaken solely for the purpose of gathering information about cultural heritage and archaeological resources. In no way will such studies replace the need for the Provincial Government to consult with the Squamish, Tsleil-Waututh, and Musqueam First Nations, nor do they attempt to address aboriginal rights issues.

Representatives of the Squamish, Tsleil-Waututh, and Musqueam First Nations participated in and/or contributed to and/or were invited to participate in this archaeological assessment. This participation in whatever means does not in any way represent their consent and/or consultation with respect to the construction of the study area. The sole purpose of this study was to identify archaeological sites, or the potential for sites, to be located within the assessment area. This study does not address Traditional Use Sites nor does it consider possible infringements of aboriginal rights and title within the assessment area.

2.0 Project Description


The Municipality of the Village of Lions Bay supplies potable water to the residents of Lions Bay via a water distribution system comprised of two raw water intakes located on Harvey and Magnesia Creeks, two water treatment plants, five storage tanks, 13 pressure reducing valve stations, and 13 kilometers of water mains including 16 pressure zones. Lions Bay's current population of approximately 1,300 is served through approximately 551 service connections. Four of the five distribution tanks require replacement: the Highway Tank; Harvey Creek Tank; Phase V Tank; and Phase IV Tank (Figure 3). The Harvey Tank, built in 1980, is the largest of the four. The three other tanks were installed in 1960.


The replacement of the four tanks is intended to increase the Village of Lions Bay's water reservoir storage capacity to the 2045 year population horizon, provide for emergency storage, prevent stagnant water development during low use periods, integrate and enhance controls of/and into the existing supervisory control and data acquisition (SCADA) system, and supply secure power and communications to the reservoir site(s).

2.1 Expected Impacts


Any archaeological sites that may be present within the study area could potentially be impacted by the replacement of the four water tank facilities. Expected machine impacts include the clearing, excavation, and grading of natural and imported landfill sediments and refuse. Machine excavation of subsurface deposits has the greatest potential to disturb any archaeological materials and/or features should they be present.

[illegible]





1:7,465



Meters

The Municipality of the Village of Lions Bay

Water System Overview

Project: Water Storage Facility Replacement
 Client: The Village of Lions Bay
 Date: June 2017
 Created By: Shawn Chapman
 Reviewed By: Brett Delwynter (P.Eng)

3.0 Definition of the Study Area and its Physiographic and Environmental Setting

3.1 Geologic Setting

The Municipality of the Village of Lions Bay is located on the eastern slopes of Howe Sound along the Sea-to-Sky Highway approximately midway between West Vancouver and Squamish, B.C. Its physiographic setting is defined by the Ministry of Forests Research Branch (Demarchi et al. 1990) as situated within the Southern Pacific Ranges Ecosection of the Pacific Ranges Ecoregion in the Georgia Depression Ecoprovince. The Southern Pacific Ranges Ecosection is characterized by rugged granitic mountains that rise abruptly above the Fraser Valley and Sunshine Coast. This ecosection is affected by westerly Pacific storms bringing heavy rain. Snow occurs from late fall to winter; summers can be dry and warm with occasional rainy periods. During periods of Arctic air outbreaks, outflow winds in the Squamish and Lillooet river valleys can be extreme. Except in several parts, intensive clearcut logging, with its attendant roads has occurred in all the valleys and lower slopes. The underlying bedrock in the study area is composed of Cretaceous age Hornblende diorite of the Gambier Group overlain with more recent flows of andesites, dacites, and other rocks of volcanic origin associated with the Garibaldi Volcanic Belt.

At the height of the last major glaciation (approximately 14,500 BP), the study area was buried under up to 1800 m of ice (Menounos et al. 2009; Slaymaker et al. 1992). Approximately 14,000 BP the glaciers began to recede, leaving the study area largely ice-free by 11,000 BP. As a consequence of the isostatic depression of the region caused by the massive weight of the ice, the early Holocene sea levels were in the order of 200+ m above modern relative sea levels (Clague et al. 1982; Kovanen and Slaymaker 2017). Subsequent to deglaciation, the study area rebounded from the weight of the ice-sheets culminating in sea levels that were roughly 13 m below present levels by 8780-9700 cal. BP (Kovanen and Slaymaker 2017:367). This was followed by eustatic change resulting in relative sea levels of 5 m below modern by circa 7000 radiocarbon years BP (Kovanen and Slaymaker 2017:367). With the emergence of the land surface during the mid-Holocene, previously glacially stored sediment loads were subjected to various non-glacial processes (marine, fluvial, mass movement, and aeolian) that led to the establishment of the modern coastline and local sediment conditions by 2330-1830 cal. years BP (Kovanen and Slaymaker 2017:367). Detailed reviews of current knowledge regarding paleoclimates, glacial history and changes in relative sea levels, and past and present land use practices in the study area can be found in Millennia Research (1997) and Slaymaker (2017).

3.2 Climatic Setting, Vegetation, and Wildlife

The study area lies within the Coastal Western Hemlock Biogeoclimatic Zone (CWH) as defined by the biogeoclimatic classification system utilized by the Ministry of Forests (see Meidinger and Pojar 1991; Pojar et al. 1991). More specifically, it is within the CWH subzone defined by Green and Klinka (1994) as the Coastal Western Hemlock dry maritime (CWHdm) variant. The CWH biogeoclimatic zone occurs at the low and middle elevations along the entire coast of the mainland, west of the Coast Mountains. In the southern portion of the CWH, the zone occupies elevations from sea level to 900 m on windward slopes. It is the wettest biogeoclimatic zone in B.C., characterized by cool summers and mild winters with a mean annual temperature ranging from 5.2°–10.5° Celsius. The mean annual precipitation ranges from 100–440 cm with less than 15% of the mean falling as snow.

The dominant tree species in the CWHdm subzone are Douglas-fir, western hemlock, and western red cedar. The shrub and herb layer is composed of salal, red huckleberry, dull Oregon-grape, vine maple, trailing blackberry, twinflower, sword fern, bracken, and bunchberry. The moss layer is primarily step moss and Oregon beaked moss with lesser amounts of flat moss and lanky moss.

The location and distribution of the CWH biogeoclimatic zone are the factors that most influence the wildlife population. Rising from sea level to 1050 m in some areas, the CWH zone has the greatest diversity and abundance of habitat elements than all other biogeoclimatic zones in the province. Black-tailed deer, black bear, grizzly bear, gray wolf, and mountain goat are the most common large mammals in the CWH zone. The former two occur throughout the zone while the latter three are specific to certain areas. The various smaller mammals and rodents include racoon, mink, river otter, marten, deer mouse, Columbian mouse, spotted skunk, gray squirrel, and the Douglas squirrel. There are also a number of marine mammals associated with the CWH zone as it pertains to the study area. Harbour seals are abundant in Howe sound while northern sea lions, and transient and resident orca pods are occasional visitors to the area (Pojar et al. 1991). Various species of salmon have been identified in many of the tributary streams that drain into Howe Sound and the Squamish and Mamquam Rivers. The littoral zone near the mouth of the Squamish River was a suitable habitat for shellfish such as clams, mussels, oysters, and chitons.

The majority of coastal, colony-nesting bird habitats on the B.C. coast are found in the CWH biogeoclimatic zone where the rocky coastline and coastal islands provide excellent protection from predation during the nesting months. The waterfowl most common to the zone are: black-legged Kittiwake, black oystercatcher, double-crested cormorant, pelagic cormorant, pigeon guillemot, glaucous-winged gull, Canada goose, and the mallard. The forested and grassy areas of the CWH zone also host a number of bird species including Cooper's hawk, red-tailed hawk, northwestern crow, northern harrier, osprey, Steller's jay, great horned owl, barred owl, common raven, ruffed grouse, among many others.

4.0 Methods

The AOA was conducted in accordance with the Guidelines and Objectives put forth in *Archaeological Overview Assessments as General Land Use Planning Tools – Provincial Standards and Guidelines* (2009). As outlined in the *Guidelines*, the purpose of an AOA is to:

- Identify and assess archaeological resource potential or sensitivity within the study area, and;
- Make recommendations concerning the appropriate methods and scope of work for subsequent studies.

For this project the AOA involved:

- A review of the archaeological, ethnographic, and historic literature pertaining to the study area;
- A review of biophysical and topographic data in the study area;
- An evaluation of archaeological site potential; and
- A preliminary field reconnaissance (PFR), or ground-truthing, of the study area to confirm or refute the archaeological site potential of the study area derived during the literature review.

4.1 Literature Review

Background data concerning known archaeological sites in the study area were obtained from the Provincial Heritage Register Database (PHRD) at the Ministry of Forests, Lands, and Natural Resource Operations in Victoria, B.C. Archaeological, ethnographic, and historic literature pertaining to the study area was gathered from a variety of institutions including: (1) various local and regional libraries; (2) the British Columbia Archives in Victoria; (3) the NRCan library (Earth Sciences); and (4) personal library collections. Published and unpublished reports relevant to the study area were also examined. The literature review was undertaken to assist in the development of a model to assess the archaeological site potential of the terrain encompassed by the study area.

General ethnographic sources that were examined include Ames and Maschner (1999), Barnett (1938, 1955), Boas (1894), Curtis (1911), Duff (1952, 1964), Hill-Tout (1902, 1905), Jenness (1955), Pickford and Flucke (1952), Rozen (1979), Suttles (1955, 1974, 1987, 1990), and Wells (1987). General syntheses of the prehistory of the Greater Vancouver Regional District include Borden (1950a, 1950b, 1961, 1968a, 1968b, 1975), R. Carlson (1983), Fladmark (1982, 1986), Hill-Tout (1895), Kenyon (1953), Matson (1976, 1981, 1996), Mitchell (1971, 1990), Morris (1993), and Porter and Copp (1993).

4.2 Review of Topographic and Biophysical Information

Topographic information was obtained from the 1:50,000-scale National Topographic Series Map 92G/06 (North Vancouver), and historic air photos. In addition to the library research, biophysical information was also obtained from the 1:250,000-scale Biogeoclimatic Ecosystem Classification Subzone/Variant Map for the Sea-to-Sky Resource District, South Coast Region, published by the Ministry of Forests, Lands and Natural Resource Operations (2016).

4.3 Archaeological Site Potential Assessment Methods

Archaeological sites in the study area may consist of one or a combination of several types of archaeological remains including habitation remains, lithic/artifact scatters, CMTs, rock art, trails, cultural depressions and other habitation features, and burial places, among others.

An assessment of archaeological site potential is based on a consideration of the locations of previously recorded archaeological sites, ethnographic and historic information, and topographical and biophysical characteristics. A correlation exists between particular biophysical characteristics and archaeological sites. The presence of these biophysical characteristics can be used to predict the likelihood of a location being used prehistorically. The biophysical characteristics considered were:

- vegetation and forest resources;
- wildlife and fish values;
- proximity to other natural resources (i.e. lithic resources);
- proximity to aquatic features;
- bedrock exposures (suitable for pictographs, burial caves, and shelters);
- aspect; and
- topography

Ethnographic studies relevant to the study area were utilized to evaluate archaeological site potential based on the correlation between archaeological site locations and biophysical characteristics. Archaeological potential values were assigned based on consideration of the following:

- topographic and biophysical characteristics;
- past historic land use and impacts;
- the results of the PFR; and
- the previous archaeological experience of the authors

4.4 Preliminary Field Reconnaissance Methods

A Preliminary Field Reconnaissance (PFR) is an optional part of an AOA. In this case, the PFR was conducted: (1) to examine the terrain within the proposed development areas for landforms that might contain archaeological sites; (2) to look for evidence that supported or denied the potential evaluation made from the documentary research and the evaluations made from maps and air photos; and (3) to assess the amount of ground disturbance due to prior land altering activities and/or erosion within the proposed development areas.

5.0 Results

5.1 Ethnographic Background

The Village of Lions Bay is located within the asserted traditional territories of the Squamish, Tsleil-Watuth, and Musqueam First Nations, all of which are part of the Coast Salish language family. The Squamish are a linguistically and culturally distinct group within the Central Coast Salish linguistic family (Barnett 1955; Suttles 1990). The Tsleil-Watuth and Musqueam Nations belong to a language group of related Central Coast Salish dialects—*Halq'eméylem*, upriver; *Hun'q'umin'um'*, downriver; and *Hul'q'umín'um'*, island—spoken in the Lower Fraser Valley, the southern Gulf Islands, and the southeastern coast of Vancouver Island (Hill-Tout 1902; Smith 2001:22; Suttles 1990). The three dialects are generically referred to as Halkomelem. The Tsleil-Watuth and Musqueam are *Hun'q'umin'um'* speakers.

There are shared areas in the asserted traditional territories of these First Nations. The asserted traditional territory of the Squamish Nation extends “from Point Grey on the south to Roberts Creek on the west; then north along the height of land to the Elaho River headwaters including all of the islands in Howe Sound and the entire Squamish valley and Howe Sound drainages; then southeast to the confluence of the Soo and Green Rivers north from Whistler; then south along the height of land to the Port Moody area including the entire Mamquam River and Indian Arm drainages; then west along the height of land to Point Grey” (Squamish Nation 2008). The Squamish Nation has recently updated their claim to include a portion of the lower Fraser River Valley.

The asserted traditional territory of the Tsleil-Watuth extends from Mount Garibaldi in the north to the Fraser River in the south, and from Coquitlam Lake in the east to Howe Sound in the west. The majority of the Tsleil-Watuth population is now centered on Burrard Inlet, between Maplewood Flats and Deep Cove in North Vancouver, B.C. (Tsleil-Watuth 2017). The name Tsleil-Watuth means ‘people of the inlet.’

The asserted traditional territory of the Musqueam First Nation extends from Harvey Creek in Howe Sound southeast through Indian Arm and Burrard Inlet to the Fraser River between the Coquitlam and Brunette Rivers, west along the south bank of the Fraser to the Straight of Georgia, and is inclusive of all islands mainland and marine areas within this expanse (Musqueam Indian Band 1976). The name of the Musqueam people originates from the word *Məθəkʷəy* (*m-uh-th-kwi*) meaning People of the River Grass (Musqueam Indian Band 2014).

Understanding the traditional lifeways and land use systems of the Coast Salish peoples is of crucial importance towards comprehending the archaeological record of this culturally and physiologically unique region. Sources of information on these communities are generally derived from contemporary Coast Salish accounts of the past and the ethnographic record. Several caveats must be attached to the use of this latter source of information. Among the most important have to do with the historical context and the amount of exposure that ethnographers studying these groups experienced during the tenure of their research. With few exceptions, ethnographers spent relatively little time exposed to Coast Salish culture, spoke with relatively few informants, and constructed their understandings of aboriginal lifeways within academic and political frameworks that were affected by a number of ethnocentric and colonial assumptions (see Klassen 2002 and Wickwire 2005 for a more detailed review of bias within

regional ethnographies). The following brief discussion is a generalized description of the Coast Salish seasonal round and material culture researched from a number of primary, and secondary works concerning the Coast Salish: Barnett (1935-1936, 1938, 1939, 1955), Bouchard and Kennedy (1991); K. T. Carlson (1997, 2001); Carter (1966, 1972); Curtis (1911); Hill-Tout (1902, 1905); Jenness (1955); MacLachlan (2000); Pickford and Flucke (1952); Sparks and Border (1989); and Suttles (1955, 1974, 1987, 1990, 2000). It is by no means intended to serve as a comprehensive review of these cultures or lifeways, past or present.

Similar to most other groups on the Northwest Coast, the Coast Salish practiced a semi-sedentary hunting-gathering-fishing economy incorporating well-established forays by specialized task groups ranging over wide territorial areas in order to acquire specific resources. This practice followed an annual cycle with dispersal from communal winter villages, sometimes ranging distances greater than 320 km (Burley 1980:6) to temporary camps in order to acquire seasonally available resources (Barnett 1938:119; Grier 2003; Sanders 2006; Sanders and Ritchie 2008), gathering again at the end of fall in winter villages. Subsistence for the Coast Salish was based on hunting terrestrial mammals (e.g., elk, deer and bear) and marine mammals (e.g. sea lions, harbour seals, and porpoises), gathering various floral resources (e.g., cedar bark, berries, camas, as well as various roots and shoots), fishing (e.g., the various available species of salmon, herring, eulachon, rockfish, lingcod, flounder and sturgeon), and gathering various species of shellfish (e.g., mussels, clams) and other intertidal resources according to a complex annual cycle (Barnett 1938:122; Pickford and Flucke 1952). In addition, western redcedar, western hemlock, western yew, willow, and Douglas-fir trees were also utilized by the Coast Salish for a variety of implements, clothing, and construction materials.

Typically, Coast Salish winter villages were located near sheltered bays with easy access to fresh water (Suttles 1990). These villages consisted of semi-permanent and permanent structures constructed from large cedar logs and planking. Seasonal campsites often consisted of cedar post frames covered by rush mats or cedar planks (Barnett 1955:40).

Documented accounts of Coast Salish burial practices during the ethnographic and ethnohistorical period report the use of baskets, boxes, and canoes to inter the remains of single or multiple persons. Mortuary containers were suspended from trees at heights of up to four meters (Menzies 1790-1795; Vancouver 1801). Mound and cairn burials have been documented in the Fraser Valley particularly at, and around, the site of Scowlitz (**DhRI-0016**), and in the Strait of Juan de Fuca on the Rocky Point Peninsula, the southern most tip of Vancouver Island. However, the temporal and geographical extent of this suite of mortuary practices are not well understood (see Mathews 2014 for an extensive review of Coast Salish ethnographic and archaeological burial practices).

Similar to most groups along the south coast, the material culture of the Coast Salish peoples was, at the time of contact, dominated by the extensive use of products derived from western redcedar (Stewart 1984; Turner 1998). Products fashioned from western red cedar included large ocean-going canoes, large rectangular plank houses, house posts, ceremonial masks, complex latticework fish weirs and fish traps, mats, intricate basketry, and various forms of clothing (Stewart 1977). Raw material for planks, posts, canoes, and boxes were procured by felling trees and subsequently splitting the logs. Stone mauls, antler, and wood wedges, nephrite adzes, and chisels with bits fashioned from stone, bone, shell, and antler were the traditional woodworking tools of the Coast Salish. Cedar bark for clothing and other items was

harvested by pulling long narrow strips of bark beginning from a small incision about waist high near the base of the tree with the subsequent extraction of the inner bark from the outer bark before transportation away from the harvesting site. In addition to material derived from western red cedar, a number of implements within Coast Salish material culture were fashioned from stone and bone. At the time of contact, polished and ground, bone, antler, and stone implements played a dominant role in material culture.

One further and important aspect of Coast Salish material culture was the processing and use of wool for weaving blankets and other textiles. The Coast Salish wool weaving tradition relied until at least the mid-19th century on a regional species of dog for its hair—the woolly dog (Howay 1918). Wool from dog's hair was supplemented by mountain goat hair, waterfowl down, and fireweed cotton (Pojar and Mackinnon 1994:206) when available (Kissel 1916; Orchard 1926; Turner 1998:175-176). The woolly dog became extinct by the middle of the 19th century. Dogs were also used for a variety of other activities throughout the northwest coast including hunting (Kennedy and Bouchard 1990:445; De Laguna 1990:190, 209; Hamori-Torok 1990:308; McLaren et al. 2005; Suttles 1990:458) and packing (De Laguna 1990:208).

The Coast Salish emphasized prestige and rank, participated in secret societies and slavery, and performed a variant of the potlatch. Coast Salish societies were stratified, with high status families claiming rights to resources, names, and ceremonial activities and regalia. The primary socio-economic group was the household, consisting of several kin-related families occupying a single plank house. The household of an established kin group and several dependent households made up the local group (Suttles 1990). Villages were usually composed of one or more houses occupied by families who cooperated economically. Villages were linked through ties of marriage and kinship providing a social network. Marriages arranged between socially equal families in different villages helped to establish systems for resource procurement, including shared access to specific resource locations and shared labour.

Precisely how far back into prehistory the ethnographic pattern described above extends is open to question. A full account of the ethnographic subsistence pattern of the Coast Salish is beyond the scope of this report. Further accounts of Coast Salish ethnography, mythology, language, subsistence practices, cultural practices, and material culture can be found in a number of primary and secondary works including, but not limited to Barnett (1935-1936, 1938, 1939, 1955), K. T. Carlson (1997, 2001), Curtis (1911), Duff (1952), Elmendorf (1960, 1961, 1971), Hill-Tout (1895, 1897, 1902, 1905), Gunther (1927), Jenness (1955), Matthews (1955, 2011), Pickford and Flucke (1952), and Suttles (1955, 1974, 1987, 1990, 2000).

5.2 Historical Background of the Capilano Watershed

The first record of Europeans in Howe Sound occurred on June 14, 1792 when George Vancouver entered the sound with a small crew using the HMS *Discovery's* yawl and launch. Vancouver named the body of water Howe Sound after Lord Howe of the Royal Navy. Spanish explorers, on the schooner *Santa Saturnina* under the command of Jose Maria Narvaez, had observed and named the sound *Boca del Carmelo* the previous year, but did not enter it. Narvaez is believed to have been the first European to enter the Gulf of Georgia (Kendrick 1986:48). When Vancouver and his crew entered Howe Sound the following year, they met and traded with approximately 40 members of the Squamish First Nation on Friday, June 15:

[I]nto the spirit of which they entered with infinitely more avidity than any of our former acquaintances, not only in bartering amongst themselves the different valuables they had obtained from us, but when that trade had become slack, in exchanging those articles again with our people; in which traffic they always took care to gain some advantage, and would frequently exult on the occasion. Some fish, their garments, spears, bows and arrows, to which these people wisely added their copper ornaments, comprised their general stock and trade. Iron, in all its forms, they judiciously preferred to any other article we had to offer (Lamb 1984:585).

The sound was surveyed in the mid-19th century during the third commission of the HMS Plumper under the command of George Henry Richard. This survey also included surveys of the lower Fraser River, Burrard Inlet, the Sunshine Coast, and Victoria and Esquimalt.

Non-Native presence and settlement within the study area began slowly with the first residents settling at Brunswick Beach around 1911 after it was surveyed in 1908. In the early 1900s, private Japanese logging companies had logged the area around Lions Bay, which precipitated more people to the area. Prior to the initial settling of the study area, the Sea-to-Sky corridor along the eastern slope of Howe Sound was used in the 1800s as a trail connecting the North Shore with Pemberton and Lillooet. At this time the route was known as the Pemberton Trail and was an expansion of a pre-existing First Nations trade route (The Lions Bay Historical Society 2001). For much of the first half of the 20th century there was little development of the study area. During this time, the Lions Bay/Brunswick Beach area was a stopping point for commercial and private boats running between Vancouver and Squamish.

The opening of the Pacific Great Eastern rail line between North Vancouver and Squamish in August 1956 and the extension of Highway 99 to Britannia Beach in 1958 allowed for greater access to the study area (The Lions Bay Historical Society 2001). In addition to access upgrades, electricity and telephone services were established in Lions Bay in the late 1950s. Following improvements to the local infrastructure, settlement of the area began to increase with the first development lots selling in the spring of 1958. Lions Bay was incorporated as a Village in 1971 and Brunswick Beach amalgamated with Lions Bay in 1999 (The Lions Bay Historical Society 2001).

Additional details regarding the historic period of the study area can be found in Akrigg and Akrigg (1975), Gough (1971, 1980), Harris (1992, 1997), Lamb (1984), The Lions Bay Historical Society (2001), and Ormsby (1971).

5.3 Previous Land Use

Whereas the preceding section gives a basic chronology of historic events associated with Lions Bay, this section is dedicated to specific examples of First Nations land use and other high potential land use patterns in the study area, whether related to habitation, subsistence-related activities, or spiritual values.

The study area is located along the eastern slopes of Howe Sound, extending from sea level to approximately 300 m above sea level. Considering the presence of three significant drainages (Harvey, Alberta, and Magnesia Creek), a shell midden site on Brunswick Beach

(**DiRt-0003**), and the pre-contact use of the Sea-to-Sky corridor as a land-based travel route, the study area was likely used as a short-term camping location during hunting and gathering trips for marine, and mid- and high-elevation resources (Reimer 2003:57-58).

The animals sought after during these forays were used for multiple purposes: food (mountain goat, deer, elk, marmot, grouse, black and brown bear, various rodents, snow goose, Canada goose); clothing (mountain goat); bone/antler/horn raw material (mountain goat, deer, elk, black and brown bear Canada goose), medicine (skunk), and feathers (bald and golden eagle). A number of different plant resources would have been available within close proximity to the study area for construction materials, clothing, containers, and food. These include western redcedar, Douglas-fir, western hemlock, and amabilis fir. Plant gathering within proximity to the study area would have focused on a variety of species such as, Alaskan blueberry, oval-leaved blueberry, red huckleberry, salal, deer fern, bunchberry, and bracken fern.

There is a place name in close proximity to the study area associated with the shell midden site (**DiRt-0003**) at Brunswick beach and the long point at the end of Alberta Bay. The place name, Kéletstn translates as “sometimes they fight” (Kwi Awt Stelmexw 2016), suggesting the area was a defensive location.

5.4 Air Photo Analysis

A series of aerial photographs taken between 1939 and 2004 inclusive were analyzed to assess recent changes to the study area over time. The use of historic aerial photographs (see Figures) indicates the rate and type of landscape changes affecting the study area, which in turn provide context for the archaeological reconstruction of past lifeways and understanding of archaeological potential in present landscapes. The following is a brief description of changes to the study area recorded in the aerial photographs. The photographs showing significant change are included.

In the first photograph (1939), Harvey and Alberta Creeks are visible as well as the Pemberton trail that later became Highway 99 (the Sea-to-Sky Highway) running north-south through the middle of the photograph (Figure 4). The Village of Lions Bay is non-existent and the locations of the future water tanks are fully treed with second growth timber. The old growth had, by this time, been removed by Japanese logging concerns earlier in the century. There is no noticeable change to the landscape until 1957 when roadways become visible above and below what will soon become Highway 99, and a jetty can be seen extending out into Howe Sound near the mouth of Alberta Creek (Figure 5).

By 1969, Lions Bay has become substantially developed with numerous roads and housing clearly visible, the Pacific Great Eastern rail line and a paved Highway 99 are also in place by this time (Figure 6). Three of the four water tanks that are to be replaced had been installed by 1969—Phase IV Tank, Phase V Tank, and the Highway Tank—but they are not visible in the photograph. Development of the Village of Lions Bay continues through to 1975 (Figure 7). The Highway Tank is visible in the 1975 photograph. All four of the water tanks marked for replacement are in place above and within the village by 1982; however, as with the previous photograph, only the Highway Tank is visible (Figure 8). Residential development continues

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through the 1980s and 1990s without any significant change to the tank locations. In the final 2004 photograph the Harvey Tank and Highway Tank are visible (Figure 9).



Figure 4: 1939 aerial photograph showing the study area (scale 1:22,000).

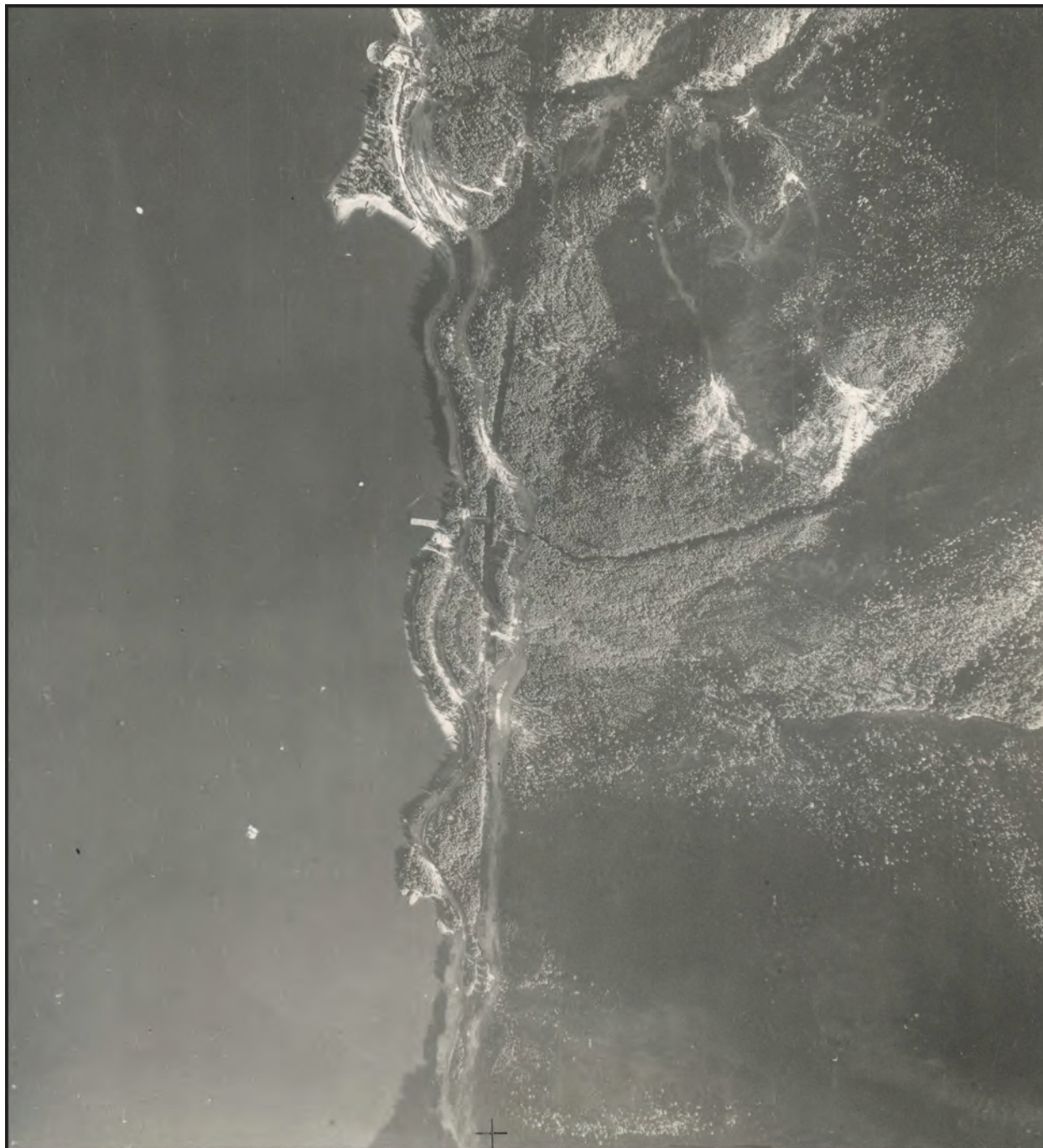


Figure 5: 1957 aerial photograph showing the study area (scale 1:15,000).



Figure 6: 1969 aerial photograph of the study area (scale 1:13,000).



Figure 7: 1975 aerial photograph of the study area (scale 1:15,000).



Figure 8: 1982 aerial photograph of the study area (1:20,000).

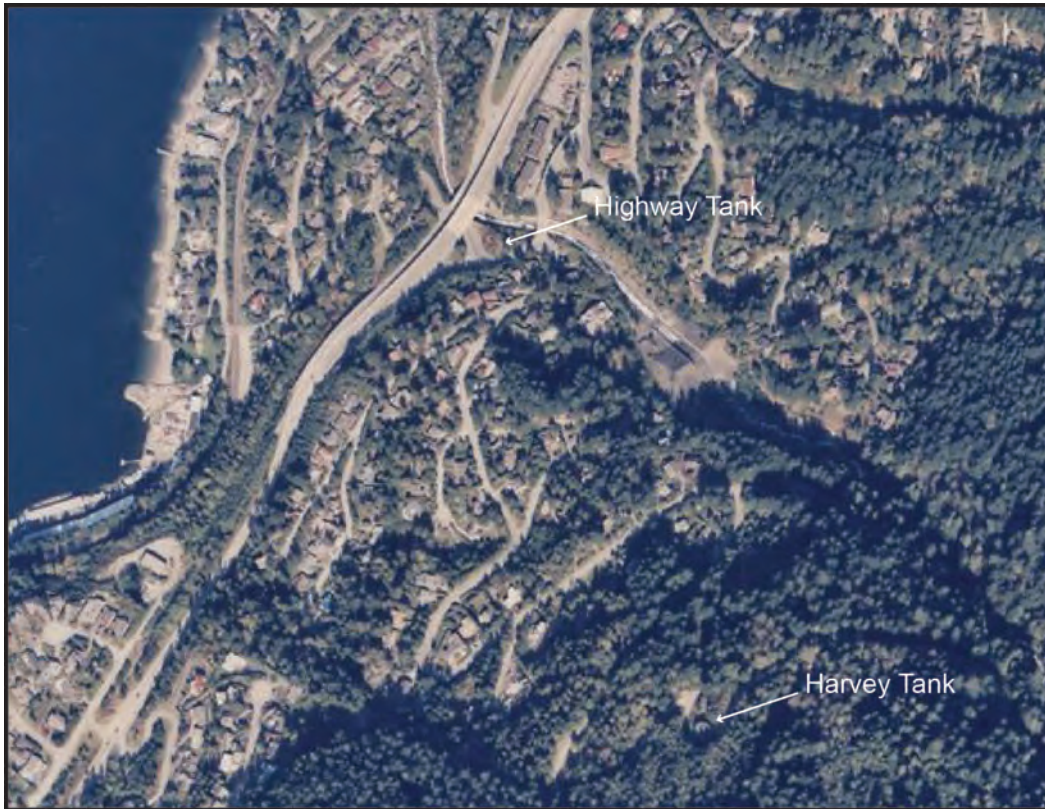


Figure 9: 2004 aerial photograph of the study area.

In summary, the most significant early disturbance to the study area visible in the photographs is associated with the initial infrastructure development in 1957 followed by the laying down of the Pacific Great Eastern rail line and the paving of Highway 99, both of which were complete by 1969. In addition, three of the four tanks were in place by 1969. The next major change to the study area is in 1982, by which time all four tanks are in place. Any archaeological sites within the footprints of the four water tanks would have been heavily impacted during installation. Development of the Village of Lions Bay would have also seriously impacted any archaeological sites within the area.

5.5 Previous Archaeological Research in and near the Study Area

The Greater Vancouver Regional District and Sea-to Sky corridor have been studied by archaeologists and anthropologists, beginning in the late 19th century with Boas (1890, 1891, 1892, 1894) and Hill-Tout (1895, 1902, 1905), through to the early 20th century, see Barnett (1935-1936, 1938, 1939, and 1955), Duff (1952), Borden (1950a, 1950b, 1961, 1968a, 1968b, 1970, 1975), Suttles (1949a,b, 1951, 1955, 1958, 1960, 1963, 1974, 1987, 1990, 2000), Mitchell (1971, 1990), and Winram (1975) to note a few of the major contributors. In 1996, Millennia Research Limited completed the Archaeological Overview Assessment of the Squamish Forest District (Millennia Research Limited 1997). The Squamish Forest District Overview was developed to assist with the management of archaeological resources within the forested environments of the Squamish Forest District, which includes the subject property. The AOA produced a model and series of 1:20,000-scale archaeological potential maps that delineated areas of high-low potential within the Squamish Forest District. The model used to produce

archaeological potential polygons for each site type (habitation, rock art, sub-alpine camps, and CMTs) was based upon sets of variables drawn from data on the physical world, that were assumed to be consistent for a particular site type. These variables were loaded into a Geographic Information System (GIS) and using TRIM data as a base layer expressing topographic and elevation information; the interactive GIS was used to produce maps that detailed areas of high and moderate archaeological potential. The utility of the Squamish Forest District AOA is that it summarizes physical characteristics of the study area across time, and considers patterns within previous archaeological and to a degree ethnographic data that are pertinent to the study area. The model's predictions regarding the association of biophysical characteristics and archaeological sites requires further community-based ethnographic research (interviewing) and ground-truthing (archaeological survey and subsurface testing).

In addition to the Squamish AOA, a number of academic projects have been undertaken in the region. Recent dissemination of these projects include Peter Locher's (2006) study of early human occupation in southwestern coastal British Columbia using data collected from the Pitt River Valley, Duncan McLaren's (2003) research in the Stave Watershed and his 2001 (2002) survey of archaeological sites in the Salmon River region of Langley, Bill Angelbeck's (2009) analysis of Coast Salish warfare, Jesse Morin's (2012) study on stone celt exchange among ancestral Coast and Interior Salish people, Terence Clark's (2010) re-assessment of the Marpole Phase, David Schaepe's (2009) study on pre-colonial Stó:lō-Coast Salish community organization, and the previous archaeological research conducted at Fort Langley by Porter and Copp (1993), Porter et al. (1995), Steer et al. (1980), and Steer and Porter (1984). Specific to the study area, Rudy Reimer (2000, 2003, 2004, 2006, 2007, 2011, 2014) has conducted a substantial amount of academic research within Squamish traditional territory. His research has greatly expanded the number and types of sites that have been identified within traditional Squamish territory and has contributed greatly to a better understanding of the nature of the ancestral occupation of the Squamish River watershed and Howe Sound, and the subsistence resource procurement and logistical mobility strategies of the region's ancestral inhabitants.

Long-standing archaeological evidence suggests that the Greater Vancouver Regional District, and the lower Fraser Valley and Fraser Canyon region have been inhabited for at least the past 9,000 years (Borden 1968a, 1975). More recent data have pushed this period of human occupation back to the terminal Pleistocene-Holocene transition, prior to 10,000 BP (McLaren and Storey 2010). General syntheses on the prehistory of the region can be found in Ames and Maschner (1999), Borden (1970, 1975), R. Carlson (1983), Fladmark (1982, 1986), Matson and Coupland (1995), Millennia Research Limited (1997), and Mitchell (1971, 1990).

5.6 Previously Recorded Archaeological Sites near the Study Area

As part of the current study, a search of the Remote Access to Archaeological Data (RAAD) was conducted. This online archaeological site database is operated by the Archaeological Branch of the Ministry of Forests, Lands, and Natural Resource Operations in Victoria, B.C. The search of RAAD found two previously recorded archaeological sites in the vicinity of the study area: **DiRt-0003** and **DiRt-0013** (Figure 10). The two sites are described below.

DiRt-0003 is located in Alberta Bay at Brunswick Beach. It is composed of shell midden and a surface lithic scatter. The point of land that juts west out into the sound from Brunswick Bay

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has a place name associated with it that translates as “sometimes they fight.” The place name is Kéletstn

DiRt-0013 is located on the west side of Highway 99 about 0.7 kms north of Newman Creek and 0.5 kms south of Lone Tree Creek. It is presently situated adjacent to a house, between the southern edge of a gravel driveway and a small garden along the southern portion of the house. The site consists of a single petroglyph.

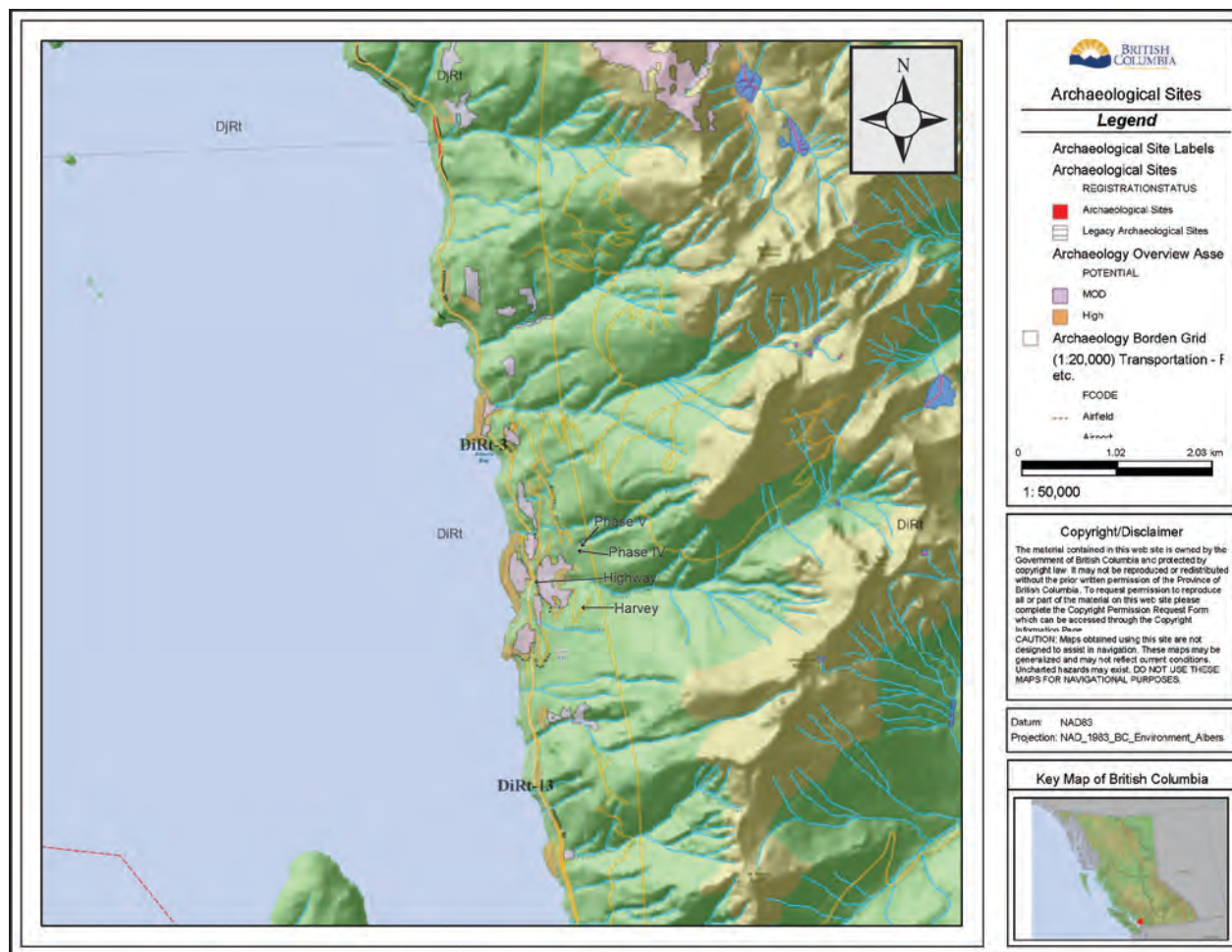


Figure 10: Map showing locations of **DiRt-0003** and **DiRt-0013** in relation to the study area.

5.7 Prefield Archaeological Potential Assessment

Archaeological sites within the Greater Vancouver Regional District and Sea-to-Sky corridor tend to be scattered unevenly throughout the region. This may have occurred due to resource availability, defensibility, preferred navigational corridors, and taboos surrounding certain types of land use practices in particular areas. The number of recorded archaeological locales in the area suggests that it was heavily utilized in precontact times and was favoured for aboriginal use. Direct evidence of disturbance of archaeological deposits through industrial, agricultural, and residential developments and/or natural processes such as erosion, flooding, mass wastage events, and boat waves have destroyed numerous archaeological sites in the region.

The types of archaeological sites that may be expected within the general study area include settlements, seasonal camps, rock shelters, lithic and/or artifacts scatters, fishing stations, land mammal hunting and trapping camps, special use campsites (sweat lodges, menstrual huts, vision quest sites, plant resource processing sites, etc.), burial sites, rock art sites (petroglyphs/pictographs) trails, CMTs, among other possibilities.

Based on the assessment of resources known to have been utilized ethnographically by the Squamish, Tsleil-Waututh, and Musqueam First Nations, and their availability in and near the location of the study area, it is surmised that the terrain encompassed by the study area was likely utilized seasonally for gathering various floral resources (e.g., berries, roots, tree bark, lumber), toolstone material, fishing, hunting, and trapping at various times during the year. However, given the impact of various forms of development within and around Lions Bay over the last century, the study area is assessed as having medium to low potential for the presence of unrecorded archaeological resources.

5.8 Results of the Preliminary Field Reconnaissance

The PFR of the study area took place on August 4th, 2017 and consisted of a judgmental and systematic survey of the proposed locations (Figures 11-26). The PFR was conducted: (1) to examine the terrain within the proposed development areas for landforms that might contain archaeological sites, (2) to look for evidence that supported or denied the potential evaluation made from the documentary research and the evaluations made from maps and air photos, and (3) to assess the amount of ground disturbance due to prior land altering activities and/or erosion within the study area.

The fieldcrew for the PFR consisted of Chris Springer (Arrowstone Archaeological Research and Consulting Limited), Kevin Rivers (Squamish Nation), and Darrell Guss (Tsleil-Waututh Nation). Unfortunately, a representative of the Musqueam First Nation was not available to be part of the field crew. Existing paved and gravel roads allowed convenient access to the four water tanks. Ground exposures were examined for the presence of cultural materials and other evidence of past human settlement and land use. Shovel testing and subsurface testing were not conducted since the PFR was not undertaken under a permit issued under the *Heritage Conservation Act*. Landforms, vegetation (and lack thereof), and aspect were noted in the field.

Paved and gravel access roads extend throughout the study area. Three of the four water tanks—Phase IV, Phase V, and Harvey Creek Tanks—all sit at approximately 250 masl, directly above and to the east of the Village of Lions Bay (Figures 11-23). The fourth tank—the Highway Tank—is located within the Village proper, just east of the Sea-to-Sky Highway (Figures 24-26). All four tanks have been built on raised platforms to function as level surfaces, in some areas the manufactured surface is two meters above the original sloped surface. The platforms consist of both local and imported fill. Piping to move the water from the tanks is buried and extends from the tank locations to the distribution system.

The Phase IV, Phase V, and Harvey Tanks are surrounded by second growth forest composed primarily of Douglas-fir, Hemlock, and western redcedar. Alberta Creek is the primary drainage associated with the Phase IV and V Tanks. It runs to the north of the tanks flowing west into Howe Sound. Harvey Creek is the primary drainage associated with the Harvey and Highway Tanks. It flows west into Howe Sound to the north of both tanks. At the Harvey Tank

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location some degree of blasting of the exposed bedrock was conducted to make additional room for the large tank (Figure 23). The exposed bedrock is basalt, which was commonly used as a toolstone in the production of flaked stone tools in the past. If this was used ancestrally as a quarry location, the extensive modification to the slope for the purpose of installing the Harvey Tank will have obliterated any archaeological evidence of quarrying behaviour. Similarly, the Highway Tank is in a location that has undergone significant modification to the landscape as it is located within the Village of Lions Bay proper (Figures 24-26).



Figure 11: Phase IV Tank, facing southeast.



Figure 12: Phase IV Tank, facing north by northeast.



Figure 13: Phase IV Tank, facing north.



Figure 14: Phase IV Tank, facing west.



Figure 15: Phase V Tank, facing north.



Figure 16: Phase V Tank, facing north by northwest.



Figure 17: Phase V Tank, facing east.



Figure 18: Phase V Tank, facing south by southeast.



Figure 19: Harvey Tank, facing north by northwest.



Figure 20: Possible location for new Harvey Tank above current location, facing south.



Figure 21: Harvey Tank, facing southeast. Darrell Guss in foreground.



Figure 22: Harvey Tank, facing northeast. Kevin Rivers in foreground.



Figure 23: Basalt exposure behind Harvey Tank. Blasting tube visible in middle of photograph, facing east.



Figure 24: Highway Tank, facing north.



Figure 25: Highway Tank, facing north.



Figure 26: Looking out from the entrance to the Highway Tank location toward Highway 99, facing west.

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In summary, the four proposed development locations are assessed as having low potential for impacting archaeological resources. This rating was as a result of the highly modified nature of the terrain encompassed by the four water tank facilities. Any archaeological sites that may have been present in the development area have been destroyed as a consequence of the original installation of the tanks and associated distribution system, and because the area has been logged at least once within the last 100 years.

6.0 Recommendations

The results of the field assessment partly concurred with the potential assessment derived from the documentary research, map, and air photo analyses. Accordingly, as a result of the highly modified nature of the terrain encompassed by the water tank storage facilities, the proposed development locations at Phase IV Tank, Phase V Tank, Harvey Tank, and Highway Tank are rated as having low potential for impacting archaeological sites. It is therefore recommended that no further archaeological work is warranted prior to the start of any future development activities provided that the study area is not expanded to include unassessed areas.

In the event that any unanticipated archaeological remains are discovered during construction activities, it is recommended that the proponent inform their personnel and all contractors of the following:

- Archaeological remains in the Province of British Columbia are protected from disturbance, intentional or accidental, by the *Heritage Conservation Act* (1994);
- In the event that archaeological remains are encountered, all activities which threaten the archaeological site(s) should be suspended at once; and
- It is the individual's responsibility to promptly advise the Archaeology Branch at the Ministry of Forests, Lands, and Resource Opportunities of the existence and location of the newly identified site(s). Mitigative measures or management options for the previously unidentified site(s) will be determined in consultation with the Archaeology Branch.
- It is further recommended that the Squamish, Tsleil-Waututh, and Musqueam First Nations be informed of any newly identified site(s).

7.0 Discussion of Results

The ethnographic review and prefield archaeological potential assessment suggested that the ancestral and descendant Squamish, Tsleil-Waututh, and Musqueam First Nations communities utilized the study area. There are abundant resources that would have made the area attractive for First Nations groups. These resources include deer, bear, elk, wolf, smaller fur-bearing animals, and fish. Numerous ethnographically utilized roots, plants, and berries would have also been available. Suitable western red cedar for construction materials may also have been present within certain portions of the study area prior to timber harvesting.

Based upon the literature review and the results of the PFR, the study area is assessed as having low potential for archaeological sites. The methods utilized within the current study are in accordance with the *Archaeological Impact Assessment Guidelines* (Apland and Kenny 1998) and are considered suitable for the study area.

It should be noted that the relative lack of previously recorded archaeological sites in the general study area should not be interpreted to mean that there was a relative lack of ancestral use of the study area. Rather, it is more likely that the relative lack of previously recorded archaeological sites in the study area reflects the fact that few archaeological investigations have occurred in the study area and/or that considerable land altering activities have already taken place within the study area without the benefit of archaeological studies preceding the development activities.

7.1 Data Gap Analysis of the Literature Consulted

Detailed information concerning how First Nation populations utilized the study area and interacted with other groups in the area is rare in the ethnographic literature. Part of the reason for this lack of information may be due to the fact that many of the ethnographers arrived after First Nation groups had been heavily impacted by smallpox and other epidemics that swept through the Province following contact (see Duff 1964; Harris 1992, 1997). As such, much of the traditional knowledge of the area may have died with the people who succumbed to these epidemics. In addition, many of the ethnographers working in the area did not start their work until well into the 20th century after many of the First Nation groups had been in contact with Europeans for more than a century after the effects of the fur trade, a cash economy, missionaries, and firearms had already heavily impacted traditional lifeways. Moreover, many of the ethnographic accounts that do exist tend to concentrate on the more permanent village settlements and do not pay as much attention to only seasonally occupied areas such as the study area.

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