APPENDIX C
Historical Reports

DRAFT

CONTAMINATION ARISING FROM THIRD-PARTY SOURCES INDEPENDENT OF MILL & TIMBER PRODUCTS LTD.

10880 DYKE ROAD, SURREY, BC

Prepared for:
Mill & Timber Products Ltd.

Prepared by:
Envirochem Services Inc.

March 2019

ENVIROCHEM SERVICES INC.

CONTAMINATION ARISING FROM THIRD-PARTY SOURCES INDEPENDENT OF MILL & TIMBER PRODUCTS LTD. 10880 DYKE ROAD, SURREY, BC

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March 3, 2019

EXECUTIVE SUMMARY

Mill & Timber Products Ltd. (Mill & Timber), the Client, retained Envirochem Services Inc. (Envirochem) to conduct a review of contamination sources for the property at 10880 Dyke Road in Surrey, BC (the Site or the Smallwood site), as part of the environmental exit assessment required for the Vancouver Fraser Port Authority (VFPA, dba the Port of Vancouver). Until recently, the Site was leased by Mill & Timber from the VFPA, but as of November 30, 2018, Mill & Timber has exited the Site. The Site had been occupied by Smallwood Sawmill Ltd. and Panabode Homes International, both of which are part of the Aspen Planers Group of Companies, which also owns Mill & Timber, the Client.

This report examines the sources of known contamination at the Site and whether Mill & Timber activities may have created the contamination. This report is based on, and supplements, the following two reports submitted under separate cover:

- Phase I Environmental Site Assessment Update, 10880 Dyke Road, Surrey, BC, prepared for Mill & Timber Products Ltd. by Envirochem Services Inc., and dated March 3, 2019.
- Review of Environmental Conditions / Updated Groundwater Quality Investigation, 10880 Dyke Road, Surrey, BC, prepared for Mill & Timber Products Ltd. by Envirochem Services Inc., and dated March 3, 2019.

The Site is located in an industrial neighbourhood, historically and currently dominated by the lumber and wood processing industry. The Site has a complex and lengthy history dating back approximately to 1949, when a sawmill or shingle mill began to operate on the property. This mill was operated by various companies over the years (in different configurations), with Lindal Cedar Homes (Lindal) being the most recent operator prior to Mill & Timber. Lindal operated the sawmill from the mid-1970s to late 1998, though it has been indicated that the sawmill was not operating at the end of Lindal's ownership.

Mill & Timber's tenure on the Site is understood as follows:

- **December 22, 1998** – Mill & Timber purchased the assets for the sawmill on the southern portion of the Site from Lindal. The portion occupied by the sawmill represents less than approximately 1/3 of the overall Site; the remainder of the Site continued to be occupied by Lindal. Lindal remained a separate corporate entity entirely independent of Mill & Timber.

- **March 31, 2000** – Mill & Timber began operating the sawmill and continued running it until early 2004, before transitioning operations to fingerjoint production and wood chipping, and then exclusively to wood chipping in 2008.
- **July 31, 2011** – Smallwood (Mill & Timber) purchased the remaining assets at the Site from Lindal Cedar Homes.
- **September 1, 2012** – Mill & Timber began to lease the Site (for the first time) directly from the Port of Vancouver. Until this time, Lindal had maintained its status as the property leaseholder and primary tenant occupying the majority of the Site.

Equipment historically present at the Site, for the most recent configuration of the sawmill, included a dry kiln, a green chain, conveyors, an oil storage shed, a distribution warehouse, several small structures, and other related sawmill infrastructure. Specific details about the previous configurations of the sawmill or shingle mill are unknown. Shingle mill / sawmill / lumber storage and distribution / related activities were the primary activities occurring at the Site prior to Mill & Timber's occupancy (1949-1998), while sawmilling (2000-2004) and wood chipping (2004-2018) were the primary activities conducted by Mill & Timber during their occupancy (note, the dry kiln was never used by Mill & Timber).

Based on the review of various records, including previous environmental reports, as well as observations made during site reconnaissance and from interviews, it is known that impacted soil and groundwater is present at the Site. In the Phase I ESA Update report (completed by Envirochem under separate cover), Envirochem identified three areas of potential environmental concern (APECs) and two areas of environmental concern (AECs) at the Site, as shown in tables below, all of which have been investigated in the past by other environmental consultants (summary of results presented in the report, Review of Environmental Conditions / Updated Groundwater Quality Investigation completed by Envirochem, provided under separate cover) and all of which reflect activities that initiated on-site prior to Mill & Timber's occupancy.

Areas of Potential Environmental Concern

Envirochem APEC ID	Former Franz APEC ID	Description	Location	PCOCs	Potentially Affected Media
ESI-APEC-1	APEC #22	Former Sawmill Operations (including kiln)	Parcels A & B	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater
ESI-APEC-2	APEC #23	Former Green Chain	Parcels A & B	LEPH/HEPH (F2/F3), PAHs, and Metals	Soil and groundwater
ESI-APEC-3	APEC #30	Imported Fill Materials	Entire Site	LEPH/HEPH (F2/F3), PAHs, and Metals	Soil and groundwater

Areas of Environmental Concern

Envirochem APEC ID	Former Franz APEC ID	Description	Location	PCOCs	Potentially Affected Media
ESI-AEC-1	APEC #34	Offsite Historical Activities or Spills and Suspect Former Storage Tank	Southeast of distribution warehouse (Parcel C)	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater
ESI-AEC-2	APEC #21	Former Oil Storage Shed / Former Single-Walled Gravity-Fed Diesel Storage Tank	Near Site Entrance (Parcel A)	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater

The hydrocarbon impacts identified in soil and groundwater at ESI-AEC-1 and ESI-AEC-2 appear to be related to historical site activities that pre-date Mill & Timber's occupancy of the Site. Based on the evidence reviewed in the various aforementioned reports, the following key conclusions are made:

ESI-AEC-1 (Outside the Distribution Warehouse)

- **Mill & Timber has not performed any activities of potential environmental concern at ESI-AEC-1.** The impacts identified do not appear to have come through the current (paved) ground surface which has been intact since before Mill & Timber's occupancy of the Site (i.e. the contaminant source would have likely been pre-existing from historical activities prior to paving or potentially from offsite).

- Mill & Timber did not occupy this area of the Site until 2012 after Lindal (who had been using the distribution warehouse) exited the Site, and when Mill & Timber then established a lease with the Port. No storage or activities of potential environmental concern were conducted by Mill & Timber at this area. Petroleum hydrocarbon impacts in soil groundwater were identified as early as 2006.
  - Mill & Timber purchased the assets of the Lindal sawmill on December 22, 1998, but their operation of the sawmill did not begin until March 31, 2000, and Mill & Timber activities were on the south portion of the Site only (approximately 1/3 of the Site) (not near the distribution warehouse which was still used by Lindal).
- Aerial photograph reviews show that there may have been an aboveground fuel storage tank in the vicinity of ESI-AEC-1 from 1963 to the early 1970s, at a time when the area appeared to be unpaved and would have been more susceptible to contamination above ground. This area of the Site was leased and occupied by Lindal Cedar Homes until 2012, by which time the soil and groundwater in this area had already been confirmed to have been impacted based on environmental assessments by others. Since Lindal left the Site and Mill & Timber began using the distribution warehouse in 2012, there have not been any storage tanks in this area.
- The petroleum hydrocarbon impacts identified in soil and groundwater at ESI-AEC-1 were identified at depth (approximately 1.35 m and deeper) and not immediately at the surface in the borehole logs reviewed. The general surficial geology at ESI-AEC-1 appears to include a paved asphalt surface and approximately 1 m of 'clean' brown sand (fill) above a grey silt (native soil). Although there was no specific testing of the 'clean' brown sand by others, there was no indication of impact in this material (based on apparent low headspace readings, visual or olfactory observations, etc.).
- Previous environmental consultants conducting investigations on behalf of the Port identified the potential of impacts from offsite spills along the rail spur. Although there maybe insufficient information to substantiate this, there has been no indication that the impacts identified were from any activities by Mill & Timber.

ESI-AEC-2 (Former Oil Storage Shed / Diesel Storage Tank)

- Petroleum hydrocarbon impacts identified at ESI-AEC-2 have been documented prior to Mill & Timber's operation of the sawmill in 2000 and prior to a lease with the Port in 2012. Both the oil storage shed and a nearby single-walled gravity-fed diesel AST believed to support sawmill operations were once present, prior to and during Mill & Timber's occupation of this portion of the Site.

- A 1996 environmental audit by Public Works and Government Services Canada (PWGSC) (prior to Mill & Timber's occupancy) and an environmental review in 1999 by Envirochem (following Mill & Timber's purchase of the sawmill assets on December 22, 1998 but before they began to operate the sawmill on March 31, 2000) identified significant oil staining on the ground surface in and in front of this shed (with wooden floor) and oily water in the containment tray for the diesel tank. The hydrocarbon impacts identified at this location appear to have existed prior to Mill & Timber's occupancy and activity onsite and appear to be related to previous storage practices by prior site occupants.
- Around 2010, the oil storage shed was removed from the Site (based on aerial photograph evidence); the aboveground tank was removed much earlier (prior to 2006) but the specific date of its removal is unclear.

ESI-APEC-1, ESI-APEC-2, ESI-APEC-3 (Other Areas)

- Mill & Timber did not partake in the importation of soil / fill to the Site during their occupation. Aerial photographs and other geotechnical reports support that the last significant infilling of the Site occurred around or prior to 1974 when the top of the bank of the Fraser River was shaped into its current configuration. Therefore, any contamination attributed to fill soils (e.g. scattered metals and low-level PAHs at certain locations) was present prior to Mill & Timber's occupation. The source of the metals and low-level PAH impacts identified is also inferred to be from the fill soils by investigations completed by others.

The information presented in this report supports Envirochem's conclusion that the contamination identified on-site arose from third-party sources entirely independent of Mill & Timber. It is Envirochem's opinion that Mill & Timber was not responsible for any significant or probable introduction of hydrocarbon contamination at the Site following the beginning of their shared occupancy with Lindal Cedar Homes in December 1998, due to operation of the sawmill between 2000 and 2004, due to wood chipping operations from 2004 to 2018, or from their use of the former Lindal distribution warehouse and surrounding area from 2012 to 2018.

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LIST OF ACRONYMS

AECs	Areas of Environmental Concern
APECs	Areas of Potential Environmental Concern
AST	Above Ground Storage Tank
CSA	Canadian Standards Association
COCs	Contaminants of Concern
CSR	Contaminated Sites Regulation
EMA	Environmental Management Act
ESA	Environmental Site Assessment
GIC	Geographic Information Centre
LEPH	Light Extractable Petroleum Hydrocarbons
LTSA	Land Title and Survey Authority of British Columbia
Ministry / MOECCS	BC Ministry of Environment & Climate Change Strategy
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCOCs	Potential Contaminants of Concern
PID	Parcel Identifier
SSI	Supplemental Site Investigation
UST	Underground Storage Tank
VFPA	Vancouver Fraser Port Authority
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 BACKGROUND

Mill & Timber Products Ltd. (Mill & Timber), the Client, retained Envirochem Services Inc. (Envirochem) to conduct a review of contamination sources for the property at 10880 Dyke Road in Surrey, BC (the Site or the Smallwood site), as part of the environmental exit assessment required for the Vancouver Fraser Port Authority (VFPA, dba the Port of Vancouver). Until recently, the Site was leased by Mill & Timber from the VFPA, but as of November 30, 2018, Mill & Timber has exited the Site. The Site had been occupied by Smallwood Sawmill Ltd. and Panabode Homes International, both of which are part of the Aspen Planers Group of Companies, which also owns Mill & Timber.

The Site is located in an industrial neighbourhood, historically and currently dominated by the lumber and wood processing industry. A site location plan is presented as Figure 1 **(Appendix A)** while a site layout plan is presented as Figure 2A for the most recent site configuration (ending November 2018) and as Figure 2B for the site configuration from 2001, which was shortly after Mill & Timber began to operate Smallwood Sawmill **(Appendix A)**.

1.2 OBJECTIVES

The objective of this report is understood as follows:

- To evaluate whether the contamination identified on-site has arisen from the activities of the tenant, Mill & Timber, or from third-party sources independent of Mill & Timber.

It is assumed that this report is not intended for a submission to, or review by, the BC Ministry of Environment and Climate Change Strategy (MOECCS).

1.3 SCOPE OF WORK

The scope of work for this report included, but was not limited to, the following:

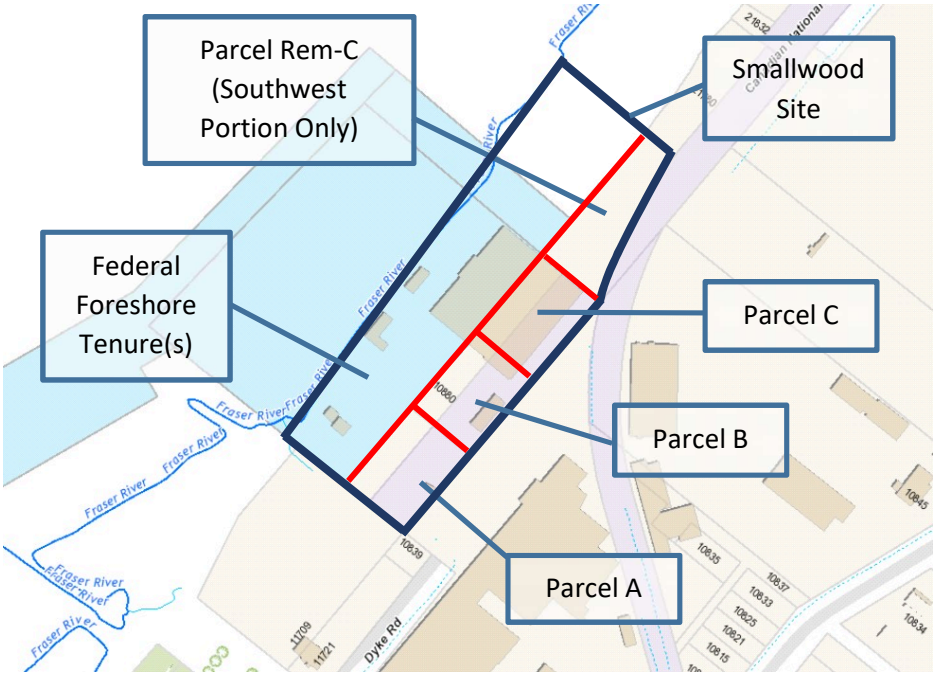
- Completion of a Phase I ESA Update, for which the specific tasks included are presented in the scope of work for that report (under separate cover).
- Completion of an Updated Groundwater Quality Report, for which the specific tasks included are presented in the scope of work for that report (under separate cover).
- Evaluating the soil and groundwater quality results in the context of the findings of the Phase I ESA to support that the contamination has arisen from third-party sources entirely independent of Mill & Timber.

2.0 SITE DESCRIPTION

2.1 GENERAL SITE DETAILS

General site details are provided in **Table 2-1** below. General property information is included in **Appendix B**.

Table 2-1: Summary of General Site Details

Item	Source Notes	Description
Address	-	10880 Dyke Road, Surrey, BC
	1	
PIDs and Legal Descriptions	1, 2, 3, 6	**Parcel A:** 012-878-260; Parcel "A" (Plan in Absolute Fees Parcel Book 12 Folio 75 No. 4114F) District Lot 6 Group 2 New Westminster District
		Parcel B: 012-878-278; Parcel "B" (Plan in Absolute Fees Parcel Book 12 Folio 75 No. 4113F) District Lot 6 Group 2 New Westminster District
		Parcel C: 012-878-286; Parcel "C" (Plan in Absolute Fees Parcel Book 12 Folio 93 No. 4222F) District Lot 6 Group 2 New Westminster District
		Parcel Rem-C: 012-878-308; Parcel "C" (Plan in Absolute Fees Parcel Book 12 Folio 78 No. 4128F) District Lot 5 Group 2 New Westminster District Except: Parcel One (Statutory Right of Way Plan NWP88158)
Latitude	1, 4	49° 12' 4.4" N (approximate centre of Site)
Longitude		122° 53' 47.2" W (approximate centre of Site)

Item	Source Notes	Description
Current Zoning	1	Light Impact Industrial 1 (IL-1)
Official Community Plan	5	Industrial
General Site Description	1, 4	The Site is largely rectangular, consisting of multiple property lots/parcels. The total combined lot size is approximately 44,144 m^2 (land lots and water lot) according to the lease, with access from Dyke Road to the south. Until November 30, 2018, the Site consisted of various small storage buildings/sheds, a wood chipper with an electrically-powered conveyor system, trailer offices, and an open space warehouse and distribution building (hereafter referred to as the distribution warehouse). Both paved and unpaved ground surfaces exist on-Site. The Site was last occupied by Smallwood Sawmill Ltd. and Panabode Homes International, a wood chipping operation and a cedar homes manufacturing business. Businesses operating in the surrounding area mostly consist of lumber storage and distribution and trucking / logistics businesses.

Table 2-1 - Source Notes:

1. City of Surrey Mapping Online System, COSMOS, accessed online 2018-10-19: http://cosmos.surrey.ca/external/
2. BC Assessment, accessed online 2018-10-19: https://www.bcassessment.ca/
3. Land Title and Survey Authority (LTSA) of British Columbia, 2018-10-19.
4. Google Earth, accessed 2018-10-19.
5. City of Surrey Official Community Plan, Bylaw No. 18020, October 20, 2014.
6. Specific details for the federal foreshore tenures were limited in the mapping sources reviewed and thus specific details about those tenures is not presented in this Phase I ESA.

2.2 PHYSICAL SITE DETAILS

The site physical setting is summarized in **Table 2-2** below.

Table 2-2: Summary of Site Physical Setting

Item	Source Notes	Description
Topography	1, 2, 3	According to contour maps obtained from iMapBC, COSMOS and Toporama, the Site is situated at approximately 4 m above sea level, with the surrounding area being relatively flat and a steady increase of elevation up to 80 m above sea level towards the southeast. As groundwater is heavily influenced by the topographic gradient and the location of nearby surface water bodies, the inferred groundwater flow direction is to the northwest towards the adjacent Fraser River. See Contour Maps in **Appendix C**.
Surface Cover	4	Approximately 20% of the Site was covered by equipment and buildings such as a wood chipper and conveyor system, storage sheds, trailer offices, and a distribution warehouse. Another 50% (approx.) of the Site was covered by impervious paved surfaces while the remaining 30% (approx.) of the Site was covered by unpaved surfaces including an unused gravel area in the northern portion of the Site, some unpaved area in the southwest part of the Site, and vegetated areas along the perimeter of the Site. The Site is now vacant with only the distribution warehouse and dry kiln structures remaining.
Water Bodies	1, 3	The Fraser River is located immediately adjacent to the Site to the northwest and Manson Canal is located approximately 380 m southwest of the Site and discharges into the Fraser River. As defined in Ministry Technical Guidance Document No. 15, the Fraser River is considered to be both freshwater and marine water habitat between the Pattullo Bridge and the George Massey Tunnel, so both aquatic water uses must be considered in all site assessments.
Aquifers	1, 5	The Provincial Groundwater Observation Well Network (PGOWN) and iMapBC were queried for aquifer details in the general area of the Site. Results indicate that an aquifer (0048, the Fraser River Junction aquifer) underlies the Site. The Aquifer Classification work sheet obtained from the PGOWN describes the aquifer as a predominantly unconfined fluvial or glaciofluvial aquifer, though confined at times. The geologic formation of the aquifer is Fraser River sediments. The Aquifer Classification Worksheet reported the geometric mean depth of the water table is 2.7 m. The aquifer identified at the Site is listed as having low demand, moderate productivity, and moderate vulnerability. An aquifer map and the associated aquifer classification worksheet are included in **Appendix C**.

Item	Source Notes	Description
Provincial Water Well Database	1	iMapBC was queried for potential water wells within a 0.5 km radius of the Site, which identified one (1) water well within the queried area. This recorded water well is located approximately 120 m southeast of the Site, and thus is not at risk from site activities as it is hydraulically up-gradient. The water wells map produced in iMapBC is included in **Appendix C**.
Surficial Geology	6	A review of the Surficial Geology Map of the New Westminster region obtained from the Geological Survey of Canada (Map 1484A) indicated the general area of the Site consists of bog, swamp and shallow lake deposits, particularly organic peat up to 14 m thick. However, previous environmental reports described the shallow stratigraphy at the Site as follows: • 1 to 3 m of variable fill (e.g. sand, gravel, some wood waste at specific locations) • 1.2 to 3.7 m of native silt followed by variable sand and silt layers • 0.3 m of peat, observed at depths between 7 m and 8 m. Surficial geology information for the Site is included in **Appendix C**.

Table 2-2 - Source Notes:

1. Ministry of Environment and Climate Change Strategy. iMapBC, accessed online 2018-10-19: https://maps.gov.bc.ca/ess/hm/imap4m/
2. City of Surrey Mapping Online System, COSMOS, accessed online 2018-10-19: http://cosmos.surrey.ca/external/
3. Natural Resources Canada, Toporama Mapping Tool, accessed online 2018-10-19: http://atlas.gc.ca/toporama/en/index.html
4. Google Earth, accessed 2018-10-19.
5. Province of British Columbia, Provincial Groundwater Observation Well Network – Groundwater Level Data Interactive Map, accessed online 2018-10-19: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells/aquifers/groundwater-observation-well-network/groundwater-level-data-interactive-map
6. Geological Survey of Canada, Department of Energy, Mines and Resources, Surficial Geology New Westminster, 1980.

3.0 DOCUMENTATION

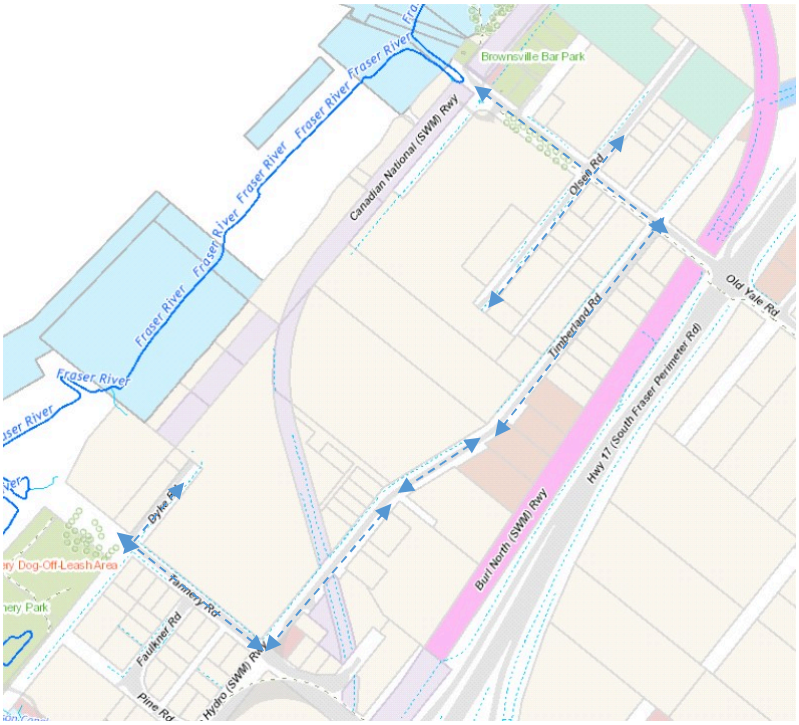
3.1 RECORDS REVIEW

Envirochem personnel reviewed available information from various sources (government and otherwise) to obtain details of the historical land use for the Site and surrounding properties (see Figure 3 in **Appendix A**). Some documents relevant to the records are included in the appendices as indicated in **Table 3-1** below.

Table 3-1: Summary of Site Records Review

Item	Source Notes	Description
Aerial Photos	1, 2, 4	Aerial photographs were obtained from the University of British Columbia Geographic Information Centre (GIC) and from COSMOS for 1938, 1949, 1951, 1954, 1963, 1969, 1974, 1982, 1986, 1991, 1997, and 2002, and every year between 2004 and 2018. These aerial photographs have been included in **Appendix D**. A summary of the pertinent details of the aerial photograph review is provided below. • **1938:** The Site appears to be developed with multiple small structures, which are likely to be small dwellings as part of a fishing village that stretches to the north and south along the Fraser River. Surrounding areas appear to be occupied by farmland to the east/northeast and woodland to the southeast. • **1949:** The fishing village that stretched along the Fraser River is no longer visible, and a commercial/industrial sized building and possibly the first signs of a sawmill or shingle mill appear in Parcel A of the Site. The rest of the Site and its surrounding area appear to be overgrown by vegetation and unoccupied, with possible remnants of the former fishing village, which may have been impacted by the Fraser River flood of 1948. • **1951**: No significant changes are observed at the Site. Surrounding areas to the south appear to be developed for industrial/commercial operations. • **1954**: Two buildings appear to have been constructed in Parcel A at the Site and the sawmill or shingle mill appears to be active. No significant changes are observed in the surrounding area, which mostly remains undeveloped. • **1963 to 1969**: The Site appears to be utilized for commercial/industrial operation(s), with multiple developed small structures different than present today. One of these structures is suspected to be an above ground storage tank (AST) based on its size; it is located along the south edge of the Site near the lot line between Parcel B and Parcel C (near where the distribution warehouse is located today). The surrounding areas to the east have been developed into an industrial operation with multiple large buildings, and the areas to the northeast appear to be going through development as well.

Item	Source Notes	Description
		• **1974**: The Site appears to be split into two operations, each with large warehouse buildings, separated by a stretch of vegetation. The operation within Parcel Rem-C seems to be part of the sawmill facility further northeast of the Site while the remainder of the Site continues to operate as its own sawmill or shingle mill. The current distribution warehouse is first evident in this year. *Note:* Aerial photos from circa 1974 and prior suggest infilling occurred during/before these periods, particularly near the foreshore. • **1982 to 2002**: Parcel Rem-C of the Site appears to be vacant with former sawmill infrastructure for the neighbouring mill decommissioned by 1986. This land appears to be prepared for development but remains vacant for most of this period. Sawmill operations appear to be ongoing at the Site, with the sawmill configuration roughly matching that which was present when Mill & Timber began to occupy the Site in 1998 (i.e. green chain, kiln, and oil storage shed are all present). Surrounding industrial properties also appear to be used for lumber storage, distribution, and related. Tannery Park appears to have been constructed southwest of the Site in 2001/02. • **2004 to 2007:** No significant changes are observed at the Site, but an apparent propane AST is visible (rounded tank) near the south corner of the distribution warehouse. The surrounding property use is similar to before. • **2008 to 2012:** Demolition of the sawmill is evident during this period, with removal of the green chain from Parcel A in 2007/2008, the oil storage shed in 2010, and the remainder of the sawmill in 2012. Only wood chipping operations appear to be occurring on-Site during this period. Parcel Rem-C appears to be used as storage space for trucks and containers. • **2013 to 2018:** The previously referenced propane tank is no longer visible after 2016. A storage shed is observed on the south side of the former kiln starting in 2017, appearing to have moved from a location west of the distribution warehouse along the upper bank of the Fraser River. Parcel Rem-C continues to be used for truck and trailer parking until late 2017 and is then vacant. No other significant changes are observed.
City Directories	3, 4	City directories from 1959, 1966, 1970, 1975, 1980, 1985, 1990, 1994, 1997, and 2001 were reviewed for information concerning the Site and surrounding area (city directories are on file with Envirochem but not appended to this report, as they were previously included in the Hemmera Phase I found in **Appendix F**). The approximate area shown in the figure below, which was selected based on the topography of the area surrounding the Site, was submitted for a City of Surrey directory search from InfoAction at the Vancouver Public Library. The history of occupancy at the Site and adjacent lands, based on the directories searched is summarized below.

Item	Source Notes	Description
		 The City of Surrey directory search included the following streets: • Dyke Road (10838 - 10880) • Tannery Road (11709 - 11849) • Old Yale Road (11918 - 12003) • Timberland Road (10790 - 10985) • Olsen Road (10942 - 11014) **Site:** The Site appeared in the city directories from at least 1990 to 2001 as being occupied by Lindal Cedar Homes Ltd., a manufacturer of pre-fabricated wooden homes. Lindal was listed as a tenant on Tannery Road starting in 1975, but no specific address was assigned to Lindal at that time. It is suspected these previous references were to the current Site location. Supreme Shingles and Brownlee Industries (kiln drying) were listed at 10862 Dyke Road in 1959; it is suspected that this address also refers to the current Site location. **North/Northeast of the Site:** Properties located to the north and northeast consisted mainly of residential dwellings from 1959 to 1975, with the Brownsville Sawmill listed at 11918 Old Yale Road for this duration; Bridgeview Cedar Ltd. also occupied part of that property from 1966 to 1975. The area underwent further transformation into commercial/industrial operations in 1990 with auto body repair shops listed at 11987, 11999 and 12003 Old Yale Road. Several other automotive related operations were listed between 1994 and

Item	Source Notes	Description
		2001, including truck servicing and repair shops. As well, the Brownsville Pub and RV Park (previously the Fraser River RV Park) was listed in the city directories from 1990 to 2001 at 11940 Old Yale Road. **East of the Site:** Properties located to the east of the Site along Timberland Road consisted of residential buildings from 1959 to 1970. From 1975 to 1985, several commercial and industrial operations including lumber and concrete businesses were listed, and in 1997 the area was taken over by auto wreckers, used auto parts shops, and trucking companies until at least 2001. **South of the Site:** Properties along Tannery Road were listed as primarily residential units between 1959 and 1970. City directories show the area to be occupied by lumber companies and trucking operations from 1975 to 2001, namely Imperial Lumber (1980 to 1997) located at 11715 Tannery Road and APEX Terminals Inc. (2001 to present). **West of the Site:** As the Site is situated immediately adjacent to the Fraser River, there are no properties located to the west of the Site. **Overall:** The Site currently borders APEX Terminals, a trucking and lumber export business, to the south; Kwest Lumber, a lumber storage and distribution business, to the southeast; RDM Enterprises Ltd., a demolition contractor, to the east; and vacant lands to the northeast. The properties currently occupied by APEX Terminals and Kwest Lumber were formerly occupied by Imperial Lumber from approximately 1980 to 2001, while RDM Enterprises Ltd. was formerly occupied by multiple other lumber operations. The property to the northeast of the Site (the former Brownsville Sawmill) has been vacant since the 1980s, except for brief periods when it was used by Lyndowana Lumber for a log salvaging operation (never listed in city directories). None of the other businesses identified in the city directories pose an environmental risk to the Site based on the types of activities that occurred and their proximity to the Site (either distance or location cross-gradient).
Land Use Plan	3	Land use plans from 1964 were reviewed. The plans show Brown Lee Mills occupying Parcels A, B, and C on-Site, with Imperial Lumber located immediately adjacent to the east. Brownsville Mills is observed to occupy the northern portion of Parcel Rem-C, and additional parcels to the northeast of the Site.
Site Registry Search	2, 5	An area wide iMapBC site registry search was conducted on October 19, 2018 for a 500 m search radius from the Site. Registered properties are not necessarily contaminated properties but are deemed to have the potential for being contaminated and/or may have been remediated. The search identified thirteen (13) registered properties, of which the Site was not included. These properties are shown on a map in **Appendix E**.

Item	Source Notes	Description
		It appears that most of the surrounding registered properties pose a low environmental risk to the Site due to various factors including, but not limited to, their location (hydraulically cross-gradient), their distance from the Site, and/or the lack of identified contamination on those properties. The only possible exception is the property to the northeast of the Site located at 11940 Old Yale Road (Site ID: 6114). This property is currently occupied by the Brownsville Pub and RV Park, and has been since at least 1990 according to city directories. The detailed site registry report indicates that a diesel spill occurred at RV Site 44 in 1999. The spill was reported to have impacted an area of approximately 56 m^2 of sand/soil. Required actions were issued by the BC MoE such that the area was to be excavated 1.5 ft (0.46 m) below the surface, and the excavated soil was to be sent for disposal. The next entry on the detailed report was updated in 2006, and the status of this record is displayed as "not assigned". Based on the limited size of this spill and the fact that it was excavated (and suggested to have been disposed of offsite), it does not appear to pose an environmental concern to the Site.
Current Title Search	6	An online search of the Land Title and Survey Authority of BC (LTSA) database conducted on July 31, 2018 identifies the Site to be federally owned. The registered owner was listed as Her Majesty the Queen in Right of Canada as Represented by the Minister of Transport c/o Vancouver Fraser Port Authority. The previous owner for each parcel was listed as the Canadian National Railway Company, from 1989 to 2011 for Parcels A, B, C and from 1991 to 2011 for Parcel Rem-C. Details are included in **Appendix B** along with the general property information.
Fire Insurance Records	-	Envirochem searched for fire insurance records for the area of the Site in the City of Surrey but was not able to find any relevant records online or through a search at UBC.

Table 3-1 - Source Notes:

1. Department of Geography. University of British Columbia. Aerial Photographs for Surrey, BC. Obtained September 2018.
2. Google Earth, accessed 2018-10-19.
3. Hemmera Envirochem Inc., 2006, Phase I ESA, Brownsville Site, Surrey, BC
4. City of Surrey Mapping Online System, COSMOS, accessed online 2018-10-19: http://cosmos.surrey.ca/external/
5. BC Online Site Registry. Accessed online 2018-10-19: https://www.bconline.gov/bc.ca/
6. Land Title and Survey Authority (LTSA) of British Columbia, 2018-10-19.

3.2 PREVIOUS ENVIRONMENTAL REPORTS

It is our understanding that the baseline environmental conditions for the Site and surrounding area are outlined in twenty-six (26) documents on file with the VFPA. These documents were provided by the VFPA to Mill & Timber, who provided them to Envirochem for review. Envirochem conducted a preliminary review of all 26 documents and has identified that only three (3) of the documents pertain directly to the Site, as listed below (and appended in **Appendix F**):

- Document #21: Phase I Environmental Site Assessment, Brownsville Site, Surrey, BC, September 2006, prepared by Hemmera Envirochem Inc. for Fraser River Port Authority.
- Document #23: Draft Supplemental Phase 2 Environmental Site Assessment, Brownsville Site, Surrey, BC, December 2008, prepared by Hemmera for Fraser River Port Authority.
- Document #1: Supplemental Site Investigation, Surrey Brownsville Site (Lots 2,3,4,5,6), Surrey, BC, June 2013, prepared by Franz Environmental for Vancouver Fraser Port Authority.

In addition, Envirochem found two former environmental audit reports on-file with Mill & Timber and internally which inform about potential sources of contamination on-Site before Mill & Timber's occupancy / before they began to operate the sawmill. The first environmental audit was conducted in August 1996 by the Environmental Services division of Public Works & Government Services Canada (PWGSC) for the purposes of a land swap between CN Rail and the federal Crown (the Crown was acquiring the Site). The second audit was conducted by Envirochem for Mill & Timber in June 1999, prior to them beginning operating the sawmill at the Site. Based on the language in the audit documents, it did not appear that Mill & Timber was a site occupant in 1996, and in 1999 it appeared that they were doing their due diligence in relation to their potential future operation of the sawmill. The Client's financial records appear to indicate that sub-lease payments to Lindal did not begin until 2003, but these audit documents suggest their preliminary involvement at the Site may have been as of 1999.

The results of these audits, and a summary of the three previous environmental reports, are presented below to provide an indication of site conditions understood prior to and during the early days of Mill & Timber's occupation of the Site.

3.2.1 1996 Environmental Audit

In August 1996, the Environmental Services Unit (ESU) of Public Works & Government Services Canada (PWGSC) conducted an environmental audit of the Site prior to acquiring title of the

lands referred to as the 'Brownsville Site'. The following key observations that are considered relevant to the Site were made by Mr. Ron Neumeyer of PWGSC at that time:

- There were no references to Mill & Timber as an occupant on-Site in this audit report, and it was directly stated that "Parcels A, B and a large portion of C are presently occupied by Lindal Cedar Homes Ltd".
- The oil storage shed was present at that time. Based on the description, it appears to be the same oil storage shed observed later, in 1999, by Envirochem (see section below). Drums of oil and diesel were stored on horizontal cradles inside the shed and were stored upright around the exterior of the shed. Oil-stained wooden floor timbers were observed inside the shed and oil staining was observed on the bare soil near the entrance to the shed (in the southeast section of "Parcel A").
- The oil storage shed was stated as having been in use for at least eight years (c. 1988). Although there are some comments made regarding impacts on "Parcel A", such as "insignificant pockets of hydrocarbon contamination", Mr. Neumeyer made a recommendation for that building to be replaced with a more modern building that would not be prone to oil potentially seeping through the floor and into the ground and to "remediate the underlying soils".
- Discussion on underground storage tanks (USTs) suggests that USTs onsite were not practical (due to the shallow water table) and no evidence of such underground installations existed. There were also no above ground storage tanks (ASTs) within the upland parcels (i.e. Parcels A, B, C, and Rem-C) at that time, but no indication was given as to whether there were any ASTs within the Federal foreshore tenure areas between the upland parcels and the Fraser River, as that area was not specifically part of the audit.
- An area of surficial oil staining was also observed on open ground southwest of several sand piles, which are shown in a figure as being on Parcel Rem-C, northeast of the distribution warehouse building. The exact location of this staining was not referenced, but it is not believed that this refers to any of the areas where hydrocarbon impacts have been previously identified on-Site.

Overall, these observations by PWGSC, a federal agency, in 1996 suggest a history of potential contamination sources due to Lindal Cedar Homes and previous operators of the sawmill / shingle mill on-Site prior to Mill & Timber's occupancy on the Site, which began approximately in 1998 as discussed below.

3.2.2 1999 Environmental Audit

In June 1999, Envirochem performed a baseline environmental audit for Mill & Timber for the portion of the Site occupied by the sawmill; the remainder of the Site was still occupied by Lindal Cedar Homes at that time, but the assets to the sawmill appear to have been purchased by Mill & Timber on December 22, 1998, per the corporate files of Mill & Timber. The following references were made in Envirochem's audit document:

- A single-wall gravity-fed diesel storage tank was located adjacent to the oil storage shed near the Site entrance. This tank was used to service Lindal's diesel transport truck. A spill containment tray was present beneath the tank but was indicated as being too small to capture a full tank of fuel if the tank was punctured; oily water was observed in the containment tray as well. There were also signs of corrosion on the outer shell of the tank. Vehicle impact protection was absent but recommended by Envirochem.
- The aforementioned oil storage shed belonged to Lindal as well, but was stated as not being in use by site representatives, likely based on the sawmill not operating at that time. Nine drums of oil were stored horizontally on a steel cradle inside the shed, and each drum was equipped with a manual valve with drips collected by a common drip tray. Full drums of chain oil were also observed outside the shed with no containment. The ground near the oil storage shed showed signs of surficial hydrocarbon staining; it was not indicated if this staining was due to oil storage or the diesel storage tank.
- Drums of other petroleum products were observed on-Site at that time, including AF46 hydraulic oil in drums near the shore, on the west side of the green chain, on the log deck, and on the first floor of the mill. Exact locations were not referenced.

These observations also suggest a history of potential contamination sources due to Lindal Cedar Homes and previous operators of the sawmill / shingle mill on-Site prior to Mill & Timber's occupancy on the Site.

3.2.3 2006 Phase I Environmental Site Assessment (Hemmera)

In September 2006, Hemmera completed a Phase I ESA of the Brownsville Site in Surrey, BC, for the Fraser River Port Authority. The 2006 study area included the entire Site, as well as parcels 7 and 8 located northeast of the Site. The Phase I ESA included the review of available information through government records, water well and aquifer database queries, directory search results, land ownership history, and a site reconnaissance visit. The 2006 Phase I ESA found 7 APECs, namely:

- Oil storage shed with extensive staining on the inside and outside of the shed, as well as unprotected drums stored inside and outside the shed.
    - Commentary by Hemmera indicated that Smallwood Sawmill (Mill & Timber) did some soil clean-up outside the shed in 2000, though staining still remained in 2006, suggesting the full extent had not been cleaned up in 2000.
- Historic sawmill operations located on-Site (including Parcels A, B, C, and Rem-C). Specific sawmill activities/locations of infrastructure were not identified.
- Oil stains and odours related to the former green chain.
- Historic fill of unknown origin across the Site (top 2 to 3 m).
- Former pentachlorophenol (PCP) spraying tank located off-site near Parcel 7.
- Adjacent up-gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B, C, Rem-C, 7, and 8.
- Brownsville Pub and RV Park diesel spill.

The locations of the above APECs, if relevant, are illustrated in **Figure 4,** appended. It should be noted that the area of study for Hemmera's Phase I ESA extended beyond the Site, and the APECs that are not of concern to the Site, as assessed by Envirochem, are not illustrated.

3.2.4 2008 Supplemental Phase 2 Environmental Site Assessment (Hemmera)

Based on the findings of their 2006 Phase I ESA (summarized above), Hemmera proceeded to conduct a Phase II ESA of the 2006 study area (Parcels A, B, C, Rem-C, 7, and 8) in 2007, and completed a Supplemental Phase II ESA in 2008, also for the Fraser River Port Authority.

Hemmera advanced five boreholes / monitoring wells in 2006 (identified as MW06-1, MW06-2, MW06-3, MW06-04 and MW06-05) to investigate the identified APECs. MW06-1 was installed to investigate the oil storage shed located at the southwest end of the Site, near the entrance. MW06-2 was used to explore the potential impacts from adjacent up-gradient historical industrial activities and the Brownsville rail spur, located to the east of the Site. MW06-3 was installed near the former kiln in Parcel B, while MW06-4 and MW06-5 were installed off-site.

As a result of the Phase II ESA, one AEC, labelled AEC-1, was identified in the area surrounding MW06-2, located to the east of the distribution warehouse.

In 2007 and 2008, Hemmera performed follow-up Phase II ESA work which consisted of one borehole and seven additional monitoring wells (MW07-6, MW07-7, MW07-8, MW07-9,

MW08-10, MW08-11, BH08-12 and MW08-13) to support the lateral and vertical delineation of soil and groundwater contamination previously identified at AEC-1.

Hemmera's Phase II ESA results showed the following:

- Soil and groundwater at AEC-1 was contaminated by light extractable petroleum hydrocarbons (LEPH), benzene, and volatile petroleum hydrocarbons (VPH).
- VPH impacts in soil were identified at MW06-2, MW07-6 and BH08-12, with concentrations as high as 3,000 µg/g (applicable standard is 200 µg/g).
- VPHw impacts in groundwater were identified at MW06-2, MW07-6 and MW07-7, with concentrations as high as 3,600 µg/L (applicable standard is 1,500 µg/L), though they appeared to be attenuating naturally with time from 2006 to 2008.
- LEPHw impacts in groundwater were identified at MW06-2, MW07-6, MW07-7 and MW07-8, with concentrations as high as 3,000 µg/L (applicable standard is 500 µg/L).

The following conclusions were made by Hemmera, based on the sample results:

- VPH-impacted soil is present within the upper sand unit and the lower silt unit at AEC-1.
- Approximately 400 m^3 of impacted soil (IL+) is present within AEC-1.
- VPHw and LEPHw impacted groundwater is present at AEC-1, though concentrations appeared to be attenuating, especially for VPHw.
- The source of these hydrocarbon impacts could not be identified. Based on laboratory chromatograms, Hemmera inferred that the VPH impacts could be associated with an aromatic petroleum hydrocarbon solvent such as Varsol, but the details to support this are unsubstantiated within the report. There is no knowledge of solvent use in that portion of the Site or on the adjacent property to the southeast.

A remedial options evaluation was completed outlining potential strategies for remediating or monitoring the contamination but no further work was carried out by Hemmera.

3.2.5 2013 Supplemental Site Investigation (Franz Environmental)

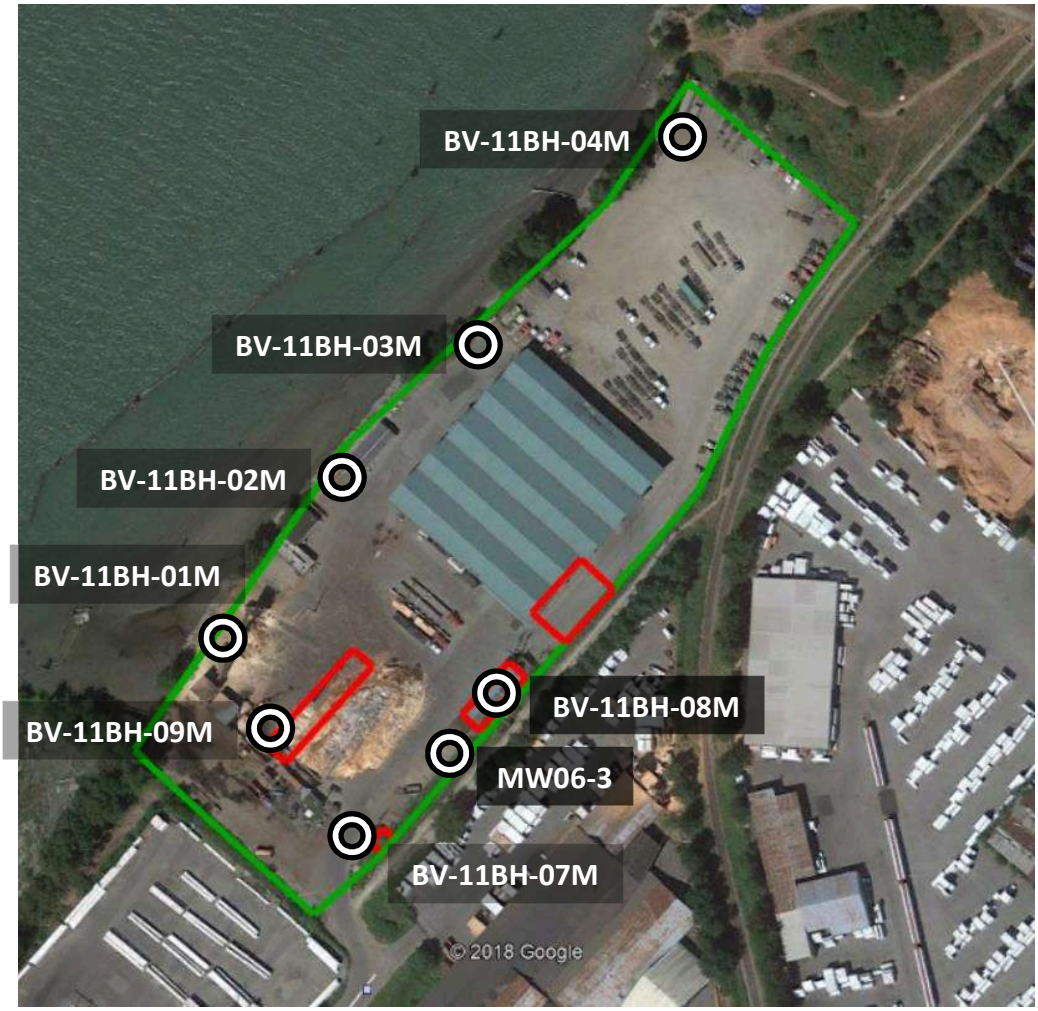
In 2011, Franz Environmental conducted a data gap investigation and provided a plan to further investigate soil and groundwater at the Site for the VFPA. In 2012, Franz conducted a supplemental site investigation (SSI) to summarize all historical and current site information to support subsequent remedial options and/or management strategies. Only Lot 6 of the studied area is understood to be relevant to the Site.

In this SSI, Franz reviewed previous environmental investigation reports and compiled all historical data, digitized historical soil and groundwater analytical results and locations, produced an updated list of APECs and PCOCs for the studied areas, and identified apparent data gaps and conducted field work to fill in those gaps.

Franz's work indicated the following:

- Localized arsenic exceedances in soil relative to federal arsenic guidelines and provincial standards at two Lot 6 foreshore locations (BV-11BH-01M and BV-11BH-05M).
- VPH exceedances in soil at APEC 34 (AEC-1 in Hemmera's reports), exceeding provincial standards. The estimated volume of the impacted material increased to 600 m^3.
- LEPHw exceedances in groundwater relative to provincial standards at the oil storage shed (APEC 21: BV-11BH-07M), with an estimated plume size of 100 m^2, and at APEC 34 (MW06-2 and MW07-7), with a plume size of approximately 200 m^2.
- PAHs exceedances in groundwater at APEC 34 (MW06-2 and MW07-7) for an approximate 200 m^2 of impacted area. Acridine, anthracene, benzo[a]anthracene, benzo[a]pyrene, fluoranthene, fluorene, phenanthrene and pyrene exceeded federal groundwater guidelines, while benzo[a]pyrene, phenanthrene, and pyrene also exceeded the provincial standards.
- Metals exceedances in groundwater across the Site, relative to federal and provincial criteria, which were attributed to fill material and proximity to the Fraser River, not due to specific historical on-site activities.

Following completion of the SSI report in 2013, it does not appear the Franz Environmental had any further involvement at the Site. The included figures below show the approximate locations of the boreholes and monitoring wells advanced by Hemmera and Franz for their investigations.



Borehole and Monitoring Well Locations (Google Earth, 2017 Aerial Photo)

Borehole and Monitoring Well Locations at Distribution Warehouse
(Google Earth, 2017 Aerial Photo)

4.0 SITE RECONNAISSANCE AND INTERVIEW

On September 11th, 2018, Mr. Bryan Tsai, EIT, of Envirochem Services Inc. visited the Site to assess the current usage of the Site and support determining the likelihood of potential impacts to the environment related to Mill & Timber's operation. A follow-up site visit was conducted by Mr. Steven Hait, EIT, on November 26, 2018, after Mill & Timber had removed the majority of infrastructure from the Site, to assess the condition as it was being turned over to the Port of Vancouver. Select photographs taken during site reconnaissance are included in **Appendix G**. The following sections summarize the key observations of the site reconnaissance.

4.1 SITE RECONNAISSANCE OBSERVATIONS

On September 11, 2018, the Site consisted of industrial wood chipping equipment, piles of lumber, several storage sheds, an open space warehouse, trailer offices, and a vacant gravel lot. Unpaved surfaces were observed at the southwest end of the Site, adjacent to the wood chipping equipment and the space formerly occupied by the sawmill green chain, as well as the entirety of the vacant lot to the northeast (Parcel Rem-C). Vegetation (mostly blackberry bushes) was observed around the perimeter of the Site. Paved surfaces were present for the rest of the Site, with several areas showing signs of previous ground repairs.

On November 26, 2018, the Site was vacant, with the exception of the distribution warehouse building (the main structure), the former dry kiln (the second structure), two concrete vaults that formerly contained transformers, and some waste collection bins. A significant amount of surface water pooling was observed on this day due to stormy conditions (46.4 mm of rain on that date at Vancouver International Airport according to Environment Canada). A localized sheen was observed on surface water runoff near the former sawmill location.

4.1.1 Tenants / Operations

On September 11, 2018, the Site appeared to be occupied by Smallwood Sawmill Ltd. and Panabode Homes International, with a vacant gravel lot in Parcel Rem-C. Envirochem notes that Smallwood and Panabode are both subsidiaries of Mill & Timber, the lessee of the Site at the time of the site reconnaissance. Smallwood occupied Parcels A and B, and the southwest portion of the foreshore lease, while Panabode occupied a portion of the distribution warehouse in Parcels B and C, and the central portion of the foreshore lease. The remainder of the distribution warehouse was generally empty, except for minor storage of supplies. These observations are depicted on the Site Layout Plan in **Figure 2A**, appended.

The area occupied by Smallwood consisted of industrial equipment including a wood chipper with a conveyor system to a hopper, as well as a trailer office, storage sheds, lumber storage

piles, and a large lumber stockpile awaiting the wood chipper. Unpaved gravel and muddy surfaces were observed at the southwest end of the Site, adjacent to the wood chipper, and along the Fraser River. Sawdust was observed to cover the ground surface around the wood chipper and the former green chain location. During the site visit, multiple trucks were observed to be unloading lumber into a central lumber pile, where an excavator fed the lumber into the wood chipper. The wood chips were transported on the conveyer system to a hopper, where they were loaded into trucks for shipping.

Panabode occupied the southwest portion of the distribution warehouse and were observed to be operating a small carpentry operation, converting lumber into wooden pieces for construction. All machinery on-Site appeared to be electric-powered, with some equipment connected to a compressed air unit. A diesel forklift for loading and unloading of freight was observed.

4.1.2 Storage Tanks

On September 11, 2018, two above ground storage tanks (AST) were observed on-Site. The first one was located in a portable wooden storage shed adjacent to the former kiln, which is now an open shed used for lumber storage and parking for personal vehicles. Upon inspection, this AST appeared to be decommissioned; hoses and pumps were observed to be disconnected from the AST. While stains were observed on the wood panel floor of the storage shed, none were observed outside the shed. The former contents of this tank were believed to be fuel oil, based on a label affixed to the tank.

The second AST was found in the distribution warehouse, adjacent to Panabode's wood processing operation. This AST appeared to be in use at the time of the site reconnaissance. No stains or odour were observed around the AST, which we believed to contain diesel fuel for the forklift used by Panabode, and potentially for other equipment used on-Site.

Apart from these tanks, two smaller propane tanks were observed adjacent to the Panabode office trailer, likely as the source of heating for that portable structure.

No signs of underground storage tanks (USTs) were observed during the site visit. By November 26, 2018, all aboveground storage tanks had been removed from the Site.

4.1.3 Chemical Storage

Other chemicals were observed on-Site on September 11, 2018, including four unlabelled 40-gallon drums next to an electrical shed in Parcel B (one of which was dented and damaged), as well as several sealed pails of diesel engine oil stored on a wooden pallet in the distribution warehouse. Small quantities of maintenance chemicals such as lubricants and engine oil were

also observed in the equipment shed near the wood chipper. All of these items were removed by Mill & Timber as part of their exit from the Site.

4.1.4 Hazardous Building Materials Assessment

A hazardous building materials assessment (HBMA) was not completed as part of this Phase I ESA Update. Envirochem had recently completed one for Mill & Timber for this property, in a report dated July 4, 2018, and it was not considered necessary to update it. The HBMA was completed by Mr. Darryl Stowe, P.Chem., ABI, of Envirochem on April 19, 2018, and focused on potential risks associated with materials used in the construction of the main structure and the second structure. The findings of this HBMA are available under separate cover, but have not been considered as directly relevant to this Phase I ESA Update.

4.2 ADJACENT SITE RECONNAISSANCE OBSERVATIONS

The Site was observed to be situated in a lumber and automotive-based industrial/commercial neighbourhood. Currently, the Canadian National Railway separates the Site from the adjacent properties to the east, which are occupied by Kwest Lumber, a lumber supplier, and RDM Enterprises Ltd., a demolition contractor. Kwest Lumber also occupies the property directly southeast of the Site on the west side of the CN Railway. The property to the northeast of the Site appeared to be vacant and overgrown with vegetation. The Fraser River borders the Site to the west/northwest, while Apex Terminals, a lumber exporter, is located to the southwest.

4.3 INTERVIEWS

An interview was conducted via phone calls, emails, and in-person meetings with Mr. Jim Henderson of Mill & Timber in October and November 2018. The following details were understood during this extended interview process:

- Lindal Cedar Homes was the operator of the sawmill from the 1970s to early 2000s, to the best of his knowledge (though other evidence has established that Mill & Timber acquired the assets to the sawmill on December 22, 1998).
- Mill & Timber began making sub-lease payments to Lindal and Apex Terminals in 2003, for the portion of the Site occupied by the sawmill.
- Mill & Timber ceased with sub-lease payments to Apex Terminals in May 2006 but began to pay property taxes to the City of Surrey at that time, on behalf of Lindal. Sub-lease payments to Lindal continued until lease payments to VFPA began in 2012.
- Mill & Timber's operations on-Site consisted of sawmilling (March 2000-April 2004), fingerjoint production (May 2004-Feb. 2008), and wood chipping (May 2004 to Nov.

2018). Mill & Timber moved a portion of their Panabode Homes operation to the Site in 2017, which consisted of minor carpentry work in the former distribution warehouse.

- Mr. Henderson had no knowledge of the 1996 or 1999 environmental audits as they pre-date his employment with Mill & Timber, and he could not identify any records showing Mill & Timber as occupants of the Site prior to 2003, when the sub-lease payments began (though other evidence later established that Mill & Timber acquired the assets to the sawmill on December 22, 1998).
- Mr. Henderson was responsible for the demolition of the sawmill that was once present on-Site. This includes the green chain removed in 2007/2008, the former dry kiln (though the structure remains present), and the other sawmill infrastructure removed in full by 2012. According to Mr. Henderson, hydraulic power units for the sawmill were drained and decommissioned as well.
- The current wood chipping activities (ending November 30, 2018) were conducted using an electric conveyor system. The only hydraulic unit present in the wood chipping operation was for the wood chip storage bin.
- Mr. Henderson indicated that a diesel storage tank was historically present at the dry kiln, for the fuelling of on-site equipment, but was removed during demolition. Currently (before November 30, 2018), a double-walled, diesel storage tank is present at the distribution warehouse and is used to fuel the Panabode forklift. This tank originated at their Panabode site in Richmond and was brought over to the Site in 2017. No tanks were previously present at this location as there was no diesel equipment to fuel on-Site.
- A decommissioned diesel exhaust fluid storage tank is currently stored in a wooden building adjacent to the dry kiln (removed prior to November 30, 2018). This tank and building were historically located along the top of the riverbank directly west of the west corner of the distribution warehouse (near monitoring well BV-11BH-02M). They were decommissioned and relocated in early 2017 to make room for the Panabode office trailers at that location.
- Mr. Henderson was not familiar with any other aboveground storage tanks that may have been present on-Site historically.
- Mr. Henderson is not aware of any underground petroleum storage tanks on-Site now or historically.
- Mr. Henderson was not aware of any historical excavation work at the Site.
- Propane and electricity are the heating and power sources for the office trailers on-Site and the kiln was heated by natural gas, to the best of his knowledge.

A brief interview was also conducted over the phone with Mr. Surinder Ghog, Owner of Mill & Timber, on November 27, 2018. The following new details were learned during this interview:

- The company Smallwood Sawmill Ltd. was incorporated in 1997 (specifically March 19, 1997 according to a BC Online Corporate Search). This was done as part of Mill & Timber taking over operation of the sawmill from Lindal in December 1998.
- When Mill & Timber took over the sawmill from Lindal, it had been sitting dormant for a period of time (estimate of duration could not be provided).
- Mr. Ghog believes that Mill & Timber operated the sawmill for approximately four years before converting to a wood chipping operation.
- Mill & Timber used to supply cedar wood to Lindal Cedar Homes for their home manufacturing business.
- An unrelated trucking business parked trucks and stored containers in the northeast portion of the Site for a short period of time; that company was responsible for transporting grain to the port. Servicing of trucks was not permitted on-site.

5.0 DISCUSSION

5.1 SITE HISTORY

Based on the information reviewed, including previous environmental reports, the following site history has been compiled by Envirochem, and to the best of our knowledge, is factual:

- **1938 to 1949:** The Site appeared to be occupied by a small fishing village with a portion of the Site transitioning to industrial use towards the end of this period. The Site was potentially affected by the Fraser River flood of 1948. By 1949, a sawmill or shingle mill (different from the most recent layout) appeared to be in operation in the southwest part of the Site with the remainder suspected as being abandoned (due to flooding).
- **1949 to 1975:** The Site operated as a shingle mill and/or sawmill, identified as Supreme Shingles and Brownlee Industries, with references to a kiln as early as 1959. The northeast vacated portion of the Site remained overgrown until the late 1950s when it began to be used as part of the sawmill / lumber storage area for Brownsville Mills further northeast. The Site was known as Brown Lee Mills starting around 1963. In 1963, there is suspected to have been an AST in the primary area (AEC-1) where hydrocarbon contamination was later found in soil and groundwater at the Site (aerial photo evidence), and the current distribution warehouse was built between 1970 and 1974. The area of the Site occupied by this suspect AST did not appear to be paved at that time. There was no evidence of this suspect AST in the 1974 aerial photographs once the distribution warehouse had been erected and the latest configuration of the sawmill had been constructed.
- **1975 to 1997**: The sawmill transitioned from Brown Lee Mills around the early 1980s, or earlier, depending on the source. Lindal Cedar Homes (Lindal) became the operator of the sawmill sometime between 1968 and 1986; city directories first referred to Lindal in 1975 but lease agreements show their presence on a portion of the Site in 1968 and the remainder of the Site in 1986. Lindal's focus was on the manufacturing of pre-fabricated cedar homes. By 1982, Brownsville Mills to the northeast had been decommissioned and the northeast portion of the Site was vacant for most of the 1980s, until it began to be used for lumber storage by Lindal in the late 1980s. It was at this point that area officially became part of the Site. Imperial Lumber continued to be the predominant land occupant in the surrounding area, as they had been since at least 1959 and as would continue until their foreclosure in the late 1990s.

An environmental audit was conducted by Public Works and Government Services Canada (PWGSC) at the Site in 1996, while it was only occupied by Lindal, showing evidence of likely hydrocarbon-contamination in soil surrounding the oil storage shed at the lease entrance.

- **1997 to 2004**: Mill & Timber began to take an interest in the Site in 1997, as evidenced by their incorporation of the company Smallwood Sawmill Ltd. in March 1997. On December 22, 1998, Mill & Timber purchased the assets of the sawmill from Lindal, though the sawmill was not operating at that time. Lindal remained a separate corporate entity not related to Mill & Timber. In June 1999, Mill & Timber had Envirochem complete a baseline environmental audit on their behalf to understand the potential environmental liabilities associated with the sawmill assets they had purchased. The Site was still leased by Lindal from CN Rail at that time, but Mill & Timber was planning on restarting operation of the sawmill at the Site, which had been dormant for several years as it had no longer been cost-effective for Lindal to operate. This environmental audit identified the presence of a gravity-fed diesel AST adjacent to the oil storage shed near the Site entrance (near Dyke Road). Similar apparent oil staining was visibly present on the ground surface in front of the shed, as it had when the 1996 environmental audit was conducted before Mill & Timber's occupancy began.

  Records indicate that Mill & Timber began operating the sawmill on March 31, 2000, but that they did not begin sub-leasing the Site officially from Lindal and from Apex Terminals until 2003 (based on sub-lease payment records).

  In the surrounding area to the southwest, Tannery Park was constructed on another contaminated site (former Imperial Lumber property) around 2001, but the distance between the Site and this property is such that cross-contamination is highly unlikely. At another offsite property (Brownsville RV Park), a small diesel spill was documented in 1999, but this property is at least 80 m from the Site as well.

- **2004 to 2006**: Mill & Timber only operated the sawmill for a brief period (less than four years) and shut it down in April 2004 before transitioning to fingerjoint production and wood chipping in May 2004. Lindal continued to operate on-Site, with their operations focused within and surrounding the distribution warehouse northeast of the sawmill. A propane AST belonging to Lindal was located south of the distribution warehouse, slightly south of where hydrocarbon contamination was eventually identified, though this contamination is not practically related to this propane tank. This tank appeared in aerial photographs between 2001 and 2016. The site to the northeast (the former Brownsville Mills site) was used for raw lumber storage by Lyndowana Lumber during this period, before being vacated once again, as continues to be the case today.

- **2006 to 2012:** Mill & Timber continued wood chipping operations on-Site throughout this period and Lindal continued to utilize the distribution warehouse. Mill & Timber stopped sub-lease payments to Apex Terminals in May 2006 but continued to make sub-lease payments to Lindal throughout this period. Environmental baseline investigations were completed during this period by other environmental consultants (Hemmera and Franz) for the Fraser River Port Authority and Vancouver Fraser Port Authority. Impacts to soil and groundwater were identified south of the southwest corner of the distribution warehouse and near the lease entrance where the oil storage shed was present until around 2010. These impacts likely pre-date Mill & Timber's occupancy of the Site, based on the aerial photograph evidence of the apparent tank near the distribution warehouse in the 1960s and reconnaissance evidence of the oil storage shed as early as 1996. Mill & Timber decommissioned the majority of the sawmill during this period, starting with the green chain in 2007/08, the oil storage shed in 2010, and the remainder of the sawmill in 2012. CN Rail sold the Site to Her Majesty the Queen in Right of Canada as Represented by the Minister of Transport in 2011. Management of the Site became the responsibility of the VFPA (dba Port of Vancouver) at that time. Smallwood Sawmill also entered into a purchase agreement with Lindal Cedar homes in July 2011 to purchase the remaining assets at the Site.
- **2012 to 2018:** Mill & Timber began to officially lease the Site for the first time from the Port of Vancouver in September 2012; it is believed that Lindal exited the Site just prior to this time. Wood chipping operations have continued on-Site until Mill & Timber's planned exit. Another Mill & Timber division, Panabode Homes International, added small portable office structures to the Site in early 2017 and began to use a small portion of the distribution warehouse for their operations, which also happens to be the manufacturing of pre-fabricated cedar homes (same as Lindal). In 2017, a diesel AST was also added at the distribution warehouse to fuel Panabode's forklift, downgradient of where impacted soil and groundwater is known to be present. As of November 30, 2018, the Site has become vacant and Mill & Timber has exited their lease with VFPA.

Key aspects of this history are presented in more detail below.

5.2 SITE USE PRIOR TO MILL & TIMBER

The history of the Site is well documented in Section 5.1, but points of interest that warrant additional discussion are as follows:

- The Site had approximately 50 years of industrial history as a shingle mill and sawmill prior to Mill & Timber's occupancy of the Site. It was known as Supreme Shingles initially

(presumably from 1949 to 1963), as Brown Lee Mills or Brownlee Industries (from 1963 to the 1970s), and the Lindal Sawmill (from the 1970s to 1998).

This mill had several different configurations, which are not all well understood today, but generally utilized the same area of the Site as was utilized for the Lindal / Smallwood sawmill.

- The sawmill was a cedar mill, by all accounts, throughout its history, and treatment of the wood with antisapstain chemicals was not completed on-Site, nor was treated wood stored on-site, to the best of our knowledge. Any references to treated wood in historical documents appear to pertain to the adjacent site to the northeast (the former Brownsville Mill that shut down by 1982).

5.3 POTENTIAL SOURCES OF CONTAMINATION (1949-1998)

Based on the evidence reviewed, the following represents the key potential sources of contamination that were present on-site before Mill & Timber's occupancy.

- Many storage tanks were present at the Site historically, though it is impossible to give a complete history of tanks at the Site. Of particular interest is a suspect above ground storage tank that appears at the inferred location of AEC-1 in aerial photographs from the 1960s, prior to the construction of the distribution warehouse around 1974. Based on these same photographs, this area of the Site appears to have been unpaved at the time the AST may have been present.
- An oil storage shed was present at the inferred location of AEC-2 as early as 1988, based on a 1996 environmental audit conducted by PWGSC. Drums of oil and diesel were stored horizontally inside the shed and upright outside the shed, with evidence of oil staining on the floor boards inside the shed and on the soil outside the shed.
- A train collision occurred on the rail spur to the east, resulting in a diesel spill (in the vicinity of AEC-1 but exact location unknown), but the evidence of this spill is limited. Previous environmental reports suggest this spill occurred in the 1960s.

5.4 SITE USE BY MILL & TIMBER

Until November 30, 2018, the Site was occupied by two tenants, Smallwood Sawmill Ltd. and Panabode Homes International. Mill & Timber has been the leaseholder of the Site since September 1, 2012, but began to occupy a portion of the Site after acquiring the assets to the sawmill (from Lindal) on December 22, 1998.

5.4.1 Sawmill and Wood Chipping Operation

Typical environmental concerns for sawmills revolve around the potential for hydrocarbon spills from equipment or hydraulic units and the potential use of large quantities of antisapstain chemicals such as chlorophenol-based preservatives to raw lumber. Cut lumber is often stacked and fork-lifted to a location for storage and left to drip-dry after treatment. To our knowledge, wood treatment or the handling of treated wood has never been part of the on-Site activities (the sawmill onsite was a cedar mill), so concerns related to chlorophenol usage are not apparent. While the potential for hydrocarbon impacts is present, the operations of Mill & Timber since their occupancy began have been working towards decreasing the potential for such impacts, through the decommissioning and demolition of most of Smallwood Sawmill, and conversion to a relatively simple wood chipping operation.

During the site reconnaissance, Envirochem did not observe evidence of hydrocarbon impacts from the current wood chipping operation, and potential impacts from the previous uses of the Site prior to Mill & Timber's occupancy appear to have been accounted for in the previous environmental investigations completed at the Site. Overall, the environmental risk surrounding Mill & Timber's recent operations on-Site is considered to be low.

5.4.2 Cedar Homes Fabrication

From approximately 2015 to 2018, Mill & Timber moved a portion of their Panabode Homes operation onto the Site, occupying a portion of the distribution warehouse and the area around that building. Components for their cedar homes were manufactured on-site and the distribution warehouse was used for storage of supplies and other items. A diesel above ground storage tank was added at the distribution warehouse in 2017, to allow for fueling of on-site equipment (i.e. a forklift), but it was observed by Envirochem to be in good condition with no staining of the surrounding asphalt / concrete. Overall, the environmental risk surrounding the Panabode operations on-Site is considered to be low, and did not overlap with the hydrocarbon contamination identified in previous reports.

5.5 NEIGHBOURING PROPERTIES

5.5.1 Kwest Lumber (Early 2000s – Present), southeast

Currently, Kwest Lumber, a lumber storage and distribution company, occupies the properties to the southeast, and is not considered to pose environmental risk to the Site. However, according to aerial photographs and previous environmental reports, Imperial Lumber Ltd. historically occupied many of the properties to the southeast of the Site and operated two sawmills from approximately 1950 to 1980.

Their operation was known to be the processing of raw logs to finished lumber, including sorting, milling, and chemical treatment.

Potential impacts to the Site as a result of these offsite operations were investigated during the baseline assessment, with the impacts at AEC-1 hypothesized as being related to those operations, and no other evidence of contamination migration from those properties to the Site.

5.5.2 Fraser River / Brownsville RV Park (1990 – Present), northeast

The Fraser River / Brownsville RV Park has been located northeast of the Site at 11940 Old Yale Road since at least 1990. This property is a site registered site on the BC Site Registry due to a small diesel spill in 1999 that was estimated to have impacted an area of 56 m^2 of soil. Although the status of this event is listed as "not assigned" in the detailed site registry report, it is likely that soil remediation was conducted due to the continual use of the property today, and such a relatively small spill is unlikely to have had the ability to impact the Site, even though the Site is down-gradient.

5.5.3 Canadian National Railway Rail Spur, east

The CN Railway has bordered the Site to the east since before 1938 (perhaps as early as 1891 according to previous environmental reports). Hemmera mentioned in their environmental reports that a diesel spill occurred along the rail spur, roughly east or northeast of the Site, in the 1960s, and that this spill may have contributed to the hydrocarbon contamination identified at AEC-1, but this cannot be verified with certainty as the exact location of the spill is undocumented.

5.5.4 Apex Terminals (2001 – Present), south

Apex Terminals is an export company that specializes in distributing lumber products and building materials. Apex has occupied the property at 11715 Tannery Road located immediately southwest of the Site since at least 2001. Apex's operation is considered to pose a low environmental risk to the Site. Prior to 2001, city directories show the address as being occupied by Imperial Lumber Ltd., likely for lumber storage as Imperial's main operations were at the current Kwest Lumber site. Historical aerial photographs confirm this property was historically used for lumber storage.

5.5.5 Vacant Land / Former Brownsville Sawmill (1982 – Present), northeast

The land to the northeast of the Site was historically occupied by the Brownsville Mill, but has been vacant (mostly) since 1982. As this property is hydraulically cross-gradient of the Site, it is unlikely to have posed a significant environmental risk to the Site. Potential impacts from that investigation would have been accounted for in the previous environmental assessments, and it was not designated as an APEC in the previous environmental reports.

5.6 IDENTIFICATION OF APECS AND AECS

Based on the review of various records, including previous environmental reports, as well as observations made during site reconnaissance and from interviews, it is known that impacted soil and groundwater is present at the Site. In the Phase I ESA Update report (completed by Envirochem under separate cover), Envirochem identified two areas of environmental concern (AECs) at the Site, as shown in Table 5-1 below and as illustrated in Figure 4 (**Appendix A**). The impacts caused at these AECs appear to pre-date Mill & Timber's occupancy of each specific portion of the Site (before 1998 at ESI-AEC-2 and before 2012 at ESI-AEC-1), with no new potential sources of contamination introduced that had not been present historically.

Table 5-1: Areas of Environmental Concern

Envirochem APEC ID	Former Franz APEC ID	Description	Location	PCOCs	Potentially Affected Medium
ESI-AEC-1	APEC #34	Offsite Historical Activities or Spills and Suspect Former Storage Tank	Southeast of distribution warehouse (Parcel C)	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater
ESI-AEC-2	APEC #21	Former Oil Storage Shed / Former Single-Walled Gravity-Fed Diesel Storage Tank	Near Site Entrance (Parcel A)	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater

Envirochem also identified three areas of potential environmental concern (APECs), as shown in Table 5-2 below, and as illustrated in Figure 4 (**Appendix A**). Though Envirochem refers to them as APECs, all three have been investigated previously by other environmental consultants (summary of results presented in Review of Environmental Conditions / Updated Groundwater Quality Investigation) and all reflect activities that initiated on-site prior to Mill & Timber's occupancy. Mill & Timber only carried on with sawmill operations from 2000 to 2004 and did not use the green chain much beyond 2004 either.

The previous investigations completed at these APECs would have been conducted after those operations shut down permanently, so the likelihood of any impacts since the Phase II and supplemental Phase II were completed is negligible. Likewise, no fill materials have been imported to the Site since Mill & Timber took over operation of the sawmill or occupancy of the Site.

Table 5-2: Areas of Potential Environmental Concern

Envirochem APEC ID	Former Franz APEC ID	Description	Location	PCOCs	Potentially Affected Media
ESI-APEC-1	APEC #22	Former Sawmill Operations (including kiln)	Parcels A & B	BTEX, VPH/F1, LEPH/HEPH (F2/F3), PAHs, and Metals	Soil, vapour and groundwater
ESI-APEC-2	APEC #23	Former Green Chain	Parcels A & B	LEPH/HEPH (F2/F3), PAHs, and Metals	Soil and groundwater
ESI-APEC-3	APEC #30	Imported Fill Materials	Entire Site	LEPH/HEPH (F2/F3), PAHs, and Metals	Soil and groundwater

All of these AECs and APECs were included in the previous environmental reports. No new APECs or AECs have been identified since the time that those reports were completed. All of the presented AECs and APECs have been investigated in the past, so further work to characterize soil and groundwater quality at those locations is not likely required.

6.0 CONCLUSIONS

Based on the review of various records, including previous environmental reports, as well as observations made during site reconnaissance and findings from interviews conducted with Mill & Timber ownership and management, it is known that contaminated soil and contaminated groundwater is present at the Site, but they appear to be related to historical site activities that pre-date Mill & Timber's occupancy of the Site, specifically oil and diesel fuel storage near the Site entrance, potential fuel storage near the distribution warehouse (or impacts from offsite), and from imported fill materials.

- **Petroleum hydrocarbon impacts existed at the oil storage shed prior to Mill & Timber occupying the Site.** The 1996 audit by Public Works and Government Services Canada (PWGSC) noted that "*It is evident that some oil and fuel residues are present in the soils below, and alongside this building*". Subsequent site visits verified these observations.
- **Mill & Timber has not performed any activities of potential environmental concern at ESI-AEC-1.** This area has been paved prior to, and since, Mill & Timber's occupancy of the Site, and no activities or storage of materials has been conducted at this location which would be of potential environmental concern to the subsurface media. Petroleum hydrocarbon impacts in soil and groundwater were identified at this location based on site investigations conducted in 2006, 2008, 2012 and 2018. Mill & Timber did not begin occupying this portion of the Site until 2012, after the contamination had been identified in the baseline assessments conducted by others.
- **Select dissolved metals concentrations in groundwater were also identified as impacts as they relate to some water uses.** Although groundwater quality concentrations of some select dissolved metals exceed some of the assessment tool criteria applied (which may or may not actually be applicable), no Mill & Timber activities were identified at ESI-AEC-1 or ESI-AEC-2 which are likely to have caused dissolved metal impacts in groundwater. The presence of apparent dissolved metals exceedances at some of the other APECs, including in fill at various locations across the Site, supports that these metals are related to the historical infilling of the Site.

Overall, hydrocarbon-impacted soil and groundwater is present at two locations on-Site. The weight of evidence supports that there was knowledge of likely impacts at the former oil storage shed (ESI-AEC-2) as early as 1996 and there appears to be no defined source for hydrocarbon impacts south of the distribution warehouse building (ESI-AEC-1) over the duration of Mill & Timber's occupancy, leading Envirochem to believe, among other factors, that those impacts also pre-date Mill & Timber's occupancy.

The information presented in this report supports Envirochem's conclusion that the contamination present on-site arose from third-party sources entirely independent of Mill & Timber. It is Envirochem's opinion that Mill & Timber was not responsible for any significant or probable introduction of hydrocarbon contamination at the Site following the beginning of their shared occupancy with Lindal Cedar Homes in December 1998, due to operation of the sawmill between 2000 and 2004, due to wood chipping operations from 2004 to 2018, or from their use of the former Lindal distribution warehouse and surrounding area from 2012 to 2018.

7.0 PARTICIPANTS AND QUALIFICATIONS

A summary of qualifications of Envirochem's assessors who conducted the site reconnaissance and reporting are as follows:

- Mr. Steven Hait, EIT, has 8 years of environmental consulting experience in site investigations and remediation in northern British Columbia and the Lower Mainland. He has conducted various aspects of project delivery including project coordination, project management, site investigations, remedial implementation, data analysis and interpretation, and technical reporting. He is registered as an Engineer in Training (EIT) in British Columbia and has a Bachelor of Applied Science degree in Mechanical Engineering and a Bachelor of Technology degree in Environmental Engineering.
- Mr. Eric Choi, P. Eng., holds an undergraduate degree in Geological Engineering (Environmental Option) and has approximately 20 years of experience in environmental site assessment and remediation. He has conducted various aspects of project delivery including project planning, site investigations, remedial implementation, data analysis and interpretation, technical reporting, and project management. He is a licensed Professional Engineer within British Columbia and has obtained numerous BC Ministry of Environment approvals for various sites.
- Mr. Bryan Tsai, EIT, holds a Bachelor of Science in Engineering in Engineering Chemistry and has completed numerous Environmental Engineering courses at BCIT. He has been trained to conduct Phase I ESAs and has additional experience in research, report writing and environmental sampling and monitoring.

Based in British Columbia, Envirochem Services Inc. (Envirochem) has provided environmental consulting and management services since 1984. Envirochem's environmental management and consulting services range from up-front environmental project planning, assessment, and permitting, to air quality management and greenhouse gas reporting, to hazardous material management, to comprehensive out-sourced environmental and sustainability management, just to name a few.

Envirochem personnel have completed numerous contaminated sites investigation, remediation, and risk assessments projects, several with approval from the provincial Ministry of Environment and Climate Change Strategy (BC ENV) including obtaining legal instruments (such as Certificates-of-Compliance, etc.), and several environmental projects (past and ongoing) with VFPA approval, including a dredging project for Pacific Coast Terminals in Port Moody, numerous projects at Neptune Bulk Terminals in North Vancouver including an ongoing major coal expansion project, and other permitting driven contaminated sites or construction management projects for Port-managed properties.

Envirochem's team has extensive history working on industrial waterfront sites (including sawmill sites) and also with Mill & Timber for Port-regulated sites including involvement at the subject site dating back to 1999.

8.0 CLOSURE

We trust this report meets your requirements at this time. If you have any questions or comments regarding this report, please contact the undersigned.

Yours truly,

Envirochem Services Inc.

Steve Hait, EIT	Eric Choi, P.Eng.
Technical Project Manager	Senior Environmental Engineer

Contributions by: Bryan Tsai, B.Sc.Eng., EIT

9.0 REFERENCES

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Vancouver Public Library Correspondence. InfoAction City Directory Search for the Surrey Area.

10.0 LIMITATIONS

This Report is intended for the sole and exclusive use of **Mill & Timber Products Ltd. (the Client) and the Vancouver Fraser Port Authority (representative of the Owner)**. This report is not for the benefit of any third party and may not be distributed to, disclosed in any form to, used by, or relied upon by, any third party without the prior written consent of Envirochem Services Inc. (Envirochem). Any other third-party recipient of this report or user of any content contained herein uses this report and its contents at its sole risk, and by acceptance or use releases Envirochem, its affiliates, officers, employees and subcontractors from any liability for direct, indirect, incidental, consequential or special loss or damage or other liability of any nature arising from its use of the report or reliance upon any of its content.

This is a technical report and is not a legal representation or interpretation of environmental laws, rules, regulations, or policies of government agencies. With respect to regulatory compliance issues, please note that regulatory statutes and the interpretation of regulatory statutes are subject to change over time.

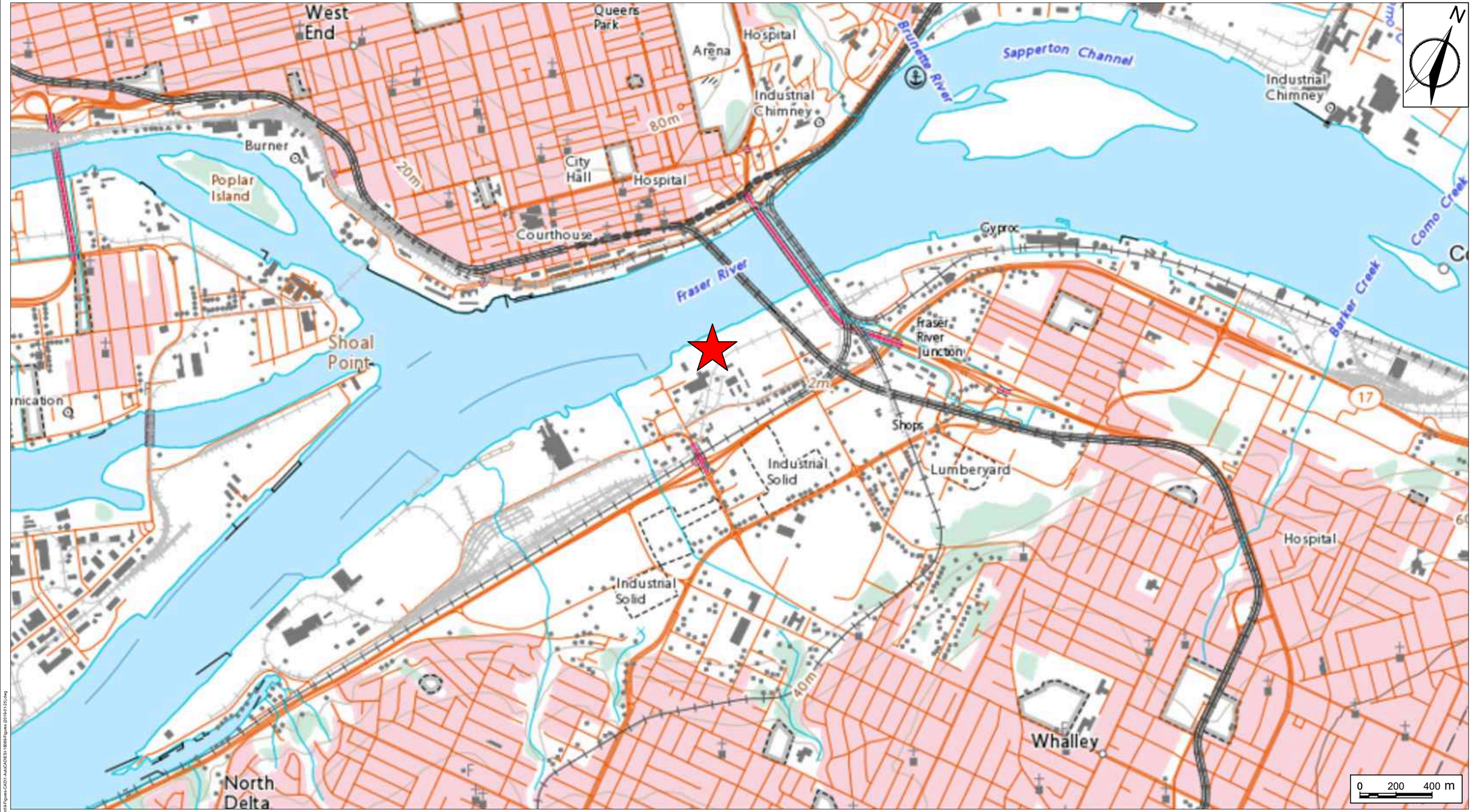
This report has been prepared in accordance with accepted environmental and/or engineering practices for a Phase I ESA (CSA Standard Z768-01). The role of the site assessor is to document evidence of contamination and not to judge the acceptability of risks associated with contamination (Clause 0.2.7 of CSA Z768-01). No other warranties, either expressed or implied, are made as to the professional services provided under the terms of the Phase I ESA and included in this report. To further reduce or eliminate uncertainty would require a Phase II ESA.

Achieving the objectives stated in this report has required us to arrive at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Site observations were only made on the subject site in accessible areas. Neighbouring properties were only observed from the subject site and public areas.

Envirochem expressly disclaims any and all warranties in connection with this report. This disclaimer of warranty includes, without limitation, any warranty that this report and the associated site investigation work has uncovered all potential environmental liabilities associated with the property. Envirochem believes this report to be accurate; however, Envirochem disclaims any warranty of the completeness or accuracy of information supplied to Envirochem that was relied upon in the preparation of this report.

APPENDIX A

FIGURES



ENVIROCHEM SERVICES INC.
206-267 Esplanade W,
North Vancouver, BC V7M1A5
T: 604-986-0233
E: response@envirochem.com

NOTE:
- Topographic image, The Atlas of Canada - Toporama (http://www.atlas.gc.ca/toporama), download date 18th September 2018.
- Original drawing is ANSI expand B (11.00 x 17.00 Inches) and in colour.

LEGEND:
★ Approximate site location

Title: Site Location Plan	Figure No: 1	Rev No: 00
	Date: January 2019	
Client: Mill and Timber Products Ltd.	Project No: 18089	
Project: Phase I Environmental Site Assessment (ESA)	Drawn: FT/GS	Checked: SH
Location: 10880 Dyke Road, Surrey, BC	Scale: 1:20000	

ENVIROCHEM SERVICES INC.
206-267 Esplanade W,
North Vancouver, BC V7M1A5
T: 604-986-0233
E: response@envirochem.com

NOTE:
- Aerial image, Google Earth Pro, imagery date 22nd July 2018, download date 15th November 2018.
- Original drawing is ANSI expand B (11.00 x 17.00 Inches) and in colour.

LEGEND:
- Approximate Site Boundary Line

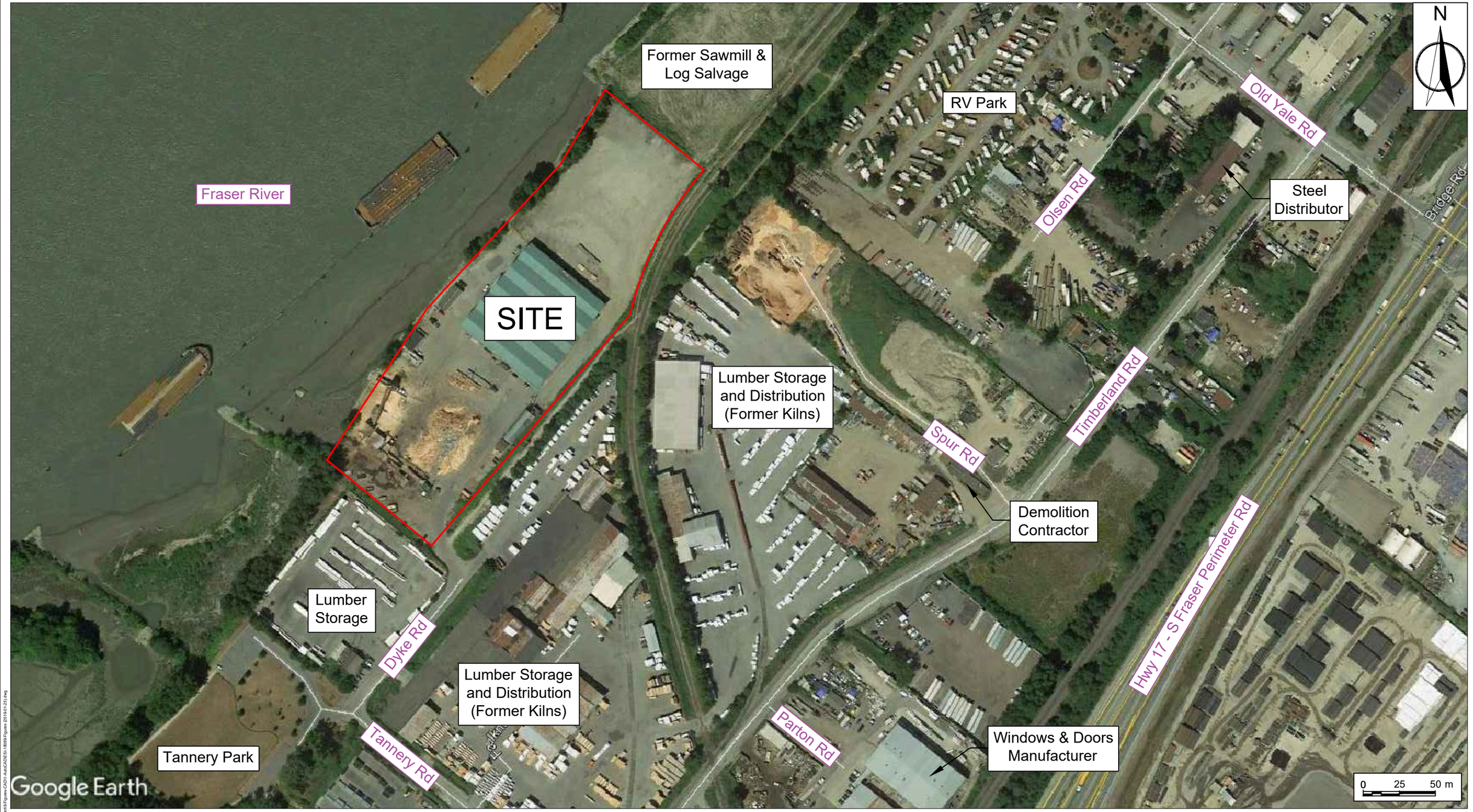
Title: Site Layout Plan (November 2018)	Figure No: 2A	Rev No: 00
	Date: January 2019	
Client: Mill and Timber Products Ltd.	Project No: 18089	
Project: Phase I Environmental Site Assessment (ESA)	Drawn: FT/GS	Checked: SH
Location: 10880 Dyke Road, Surrey, BC	Scale: 1:1500	

ENVIROCHEM SERVICES INC
206-267 Esplanade W,
North Vancouver, BC V7M1A5
T: 604-986-0233
E: response@envirochem.com

NOTE:
- Aerial image, Google Earth Pro, imagery date 9th April 2001, download date 15th November 2018.
- Original drawing is ANSI expand B (11.00 x 17.00 Inches) and in colour.

LEGEND:
- Approximate Site Boundary Line

Title: Site Layout Plan (Historical - 2001)	Figure No: 2B	Rev No: 00
	Date: January 2019	
Client: Mill and Timber Products Ltd.	Project No: 18089	
Project: Phase I Environmental Site Assessment (ESA)	Drawn: FT/GS	Checked: SH
Location: 10880 Dyke Road, Surrey, BC	Scale: 1:1500	



ENVIROCHEM SERVICES INC.
206-267 Esplanade W,
North Vancouver, BC V7M1A5
T: 604-986-0233
E: response@envirochem.com

NOTE:
- Aerial image, Google Earth Pro, imagery date 22nd July 2018, download date 15th November 2018.
- Original drawing is ANSI expand B (11.00 x 17.00 Inches) and in colour.

LEGEND:
- Approximate Site Boundary Line

Title: Site & Surrounding Area	Figure No: 3	Rev No: 00
	Date: January 2019	
Client: Mill and Timber Products Ltd.	Project No: 18089	
Project: Phase I Environmental Site Assessment (ESA)	Drawn: FT/GS	Checked: SH
Location: 10880 Dyke Road, Surrey, BC	Scale: 1:2500	

ENVIROCHEM SERVICES INC

206-267 Esplanade W,
North Vancouver, BC V7M1A5
T: 604-986-0233
E: response@envirochem.com

NOTE:
- Aerial image, Google Earth Pro, imagery date 22nd July 2018, download date 15th November 2018.
- Original drawing is ANSI expand B (11.00 x 17.00 Inches) and in colour.

LEGEND:
- ESI-APEC-3 (former APEC #25/30) - Site Boundary
- ESI-AEC-2 (former APEC #21, former AEC#2)
- ESI-APEC-1 (former APEC #22)
- ESI-APEC-2 (former APEC #23)
- ESI-AEC-1 (former APEC #34, former AEC #1

Title: Areas of Environmental Concern and Areas of Potential Environmental Concern	Figure No: 4	Rev No: 00
	Date: January 2019	
Client: Mill and Timber Products Ltd.	Project No: 18089	
Project: Phase I Environmental Site Assessment (ESA)	Drawn: FT/GS	Checked: SH
Location: 10880 Dyke Road, Surrey, BC	Scale: 1:1500	

APPENDIX B

PROPERTY RELATED INFORMATION

TITLE SEARCH PRINT 2018-07-31, 14:59:30

File Reference: 18089 Requestor: Gail Slavik

Declared Value $ 410000

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Land Title District NEW WESTMINSTER
Land Title Office NEW WESTMINSTER

Title Number BB1931162
From Title Number AC7142

Application Received 2011-02-01

Application Entered 2011-02-04

Registered Owner in Fee Simple
Registered Owner/Mailing Address: HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE MINISTER OF TRANSPORT
C/O VANCOUVER FRASER PORT AUTHORITY, PURSUANT TO SS. 46(1)
100 THE POINTE, 999 CANADA PLACE
VANCOUVER, BC
V6C 3T4

Taxation Authority Surrey, City of

Description of Land
Parcel Identifier: 012-878-260
Legal Description:
PARCEL "A" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75 NO. 4114F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations
NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

TITLE SEARCH PRINT 2018-07-31, 14:59:30

File Reference: 18089 Requestor: Gail Slavik

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT SECTION 188 LAND TITLE ACT
Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	AC7142
From Title Number	D9652 626291E
Application Received	1989-01-14
Application Entered	1989-01-27
Title Cancelled	**2011-02-04**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: CANADIAN NATIONAL RAILWAY COMPANY
1150 STATION STREET
VANCOUVER, BC

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-260

Legal Description:

PARCEL "A" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75 NO. 4114F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations

NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 2011-02-04
Description: ALL BB1931162

PARCEL IDENTIFIER (PID): 012-878-260

SHORT LEGAL DESCRIPTION:U/NEW WESTMINSTER////2//6/////A
MARG:* 12/75/4114F
TAXATION AUTHORITY:
1 Surrey, City of

FULL LEGAL DESCRIPTION: CURRENT
PARCEL "A" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75
NO. 4114F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

MISCELLANEOUS NOTES:
NWPA PLAN 45248 NWPA PLAN 45799

ASSOCIATED PLAN NUMBERS:
PLAN NWP45248
PLAN NWP45799

AFB/IFB: MN: Y PE: 0 SL: 1 TI: 1

TITLE SEARCH PRINT 2018-07-31, 15:00:36

File Reference: 18089 Requestor: Gail Slavik

Declared Value $ 405000

CURRENT AND CANCELLED INFORMATION SHOWN

Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	BB1931163
From Title Number	AC7143
Application Received	2011-02-01
Application Entered	2011-02-04

Registered Owner in Fee Simple

Registered Owner/Mailing Address: HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE MINISTER OF TRANSPORT
C/O VANCOUVER FRASER PORT AUTHORITY, PURSUANT TO SS. 46(1)
100 THE POINTE, 999 CANADA PLACE
VANCOUVER, BC
V6C 3T4

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-278

Legal Description:

PARCEL "B" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75 NO. 4113F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations

NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

Corrections NONE

TITLE SEARCH PRINT 2018-07-31, 15:00:36

File Reference: 18089 Requestor: Gail Slavik

CURRENT AND CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT SECTION 188 LAND TITLE ACT
Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	AC7143
From Title Number	D9652 626291E
Application Received	1989-01-14
Application Entered	1989-01-27
Title Cancelled	**2011-02-04**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: CANADIAN NATIONAL RAILWAY COMPANY
1150 STATION STREET
VANCOUVER, BC

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-278

Legal Description:

PARCEL "B" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75 NO. 4113F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations

NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 2011-02-04
Description: ALL BB1931163

Corrections NONE

PARCEL IDENTIFIER (PID): 012-878-278

SHORT LEGAL DESCRIPTION:U/NEW WESTMINSTER////2//6/////B
MARG:* 12/75/4113F
TAXATION AUTHORITY:
1 Surrey, City of

FULL LEGAL DESCRIPTION: CURRENT
PARCEL "B" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 75
NO. 4113F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

MISCELLANEOUS NOTES:
NWPA PLAN 45248 NWPA PLAN 45799

ASSOCIATED PLAN NUMBERS:
PLAN NWP45248
PLAN NWP45799

AFB/IFB: MN: Y PE: 0 SL: 1 TI: 1

TITLE SEARCH PRINT 2018-07-31, 15:00:36

File Reference: 18089 Requestor: Gail Slavik

Declared Value $ 410000

CURRENT AND CANCELLED INFORMATION SHOWN

Land Title District NEW WESTMINSTER
Land Title Office NEW WESTMINSTER

Title Number BB1931164
From Title Number AC7144

Application Received 2011-02-01

Application Entered 2011-02-04

Registered Owner in Fee Simple
Registered Owner/Mailing Address: HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE MINISTER OF TRANSPORT
C/O VANCOUVER FRASER PORT AUTHORITY, PURSUANT TO SS. 46(1)
100 THE POINTE, 999 CANADA PLACE
VANCOUVER, BC
V6C 3T4

Taxation Authority Surrey, City of

Description of Land
Parcel Identifier: 012-878-286
Legal Description:
PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 93 NO. 4222F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations
NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

Corrections NONE

TITLE SEARCH PRINT 2018-07-31, 15:00:36

File Reference: 18089 Requestor: Gail Slavik

CURRENT AND CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT SECTION 188 LAND TITLE ACT
Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	AC7144
From Title Number	D9652 626291E
Application Received	1989-01-14
Application Entered	1989-01-27
Title Cancelled	**2011-02-04**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: CANADIAN NATIONAL RAILWAY COMPANY
1150 STATION STREET
VANCOUVER, BC

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-286

Legal Description:

PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 93 NO. 4222F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations

NOTICE UNDER SALE OF GOODS ON CONDITIONAL ACT, NO. 3798

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 2011-02-04
Description: ALL BB1931164

Corrections NONE

PARCEL IDENTIFIER (PID): 012-878-286

SHORT LEGAL DESCRIPTION:U/NEW WESTMINSTER////2//6/////C
MARG:* 12/93/4222F
TAXATION AUTHORITY:
1 Surrey, City of

FULL LEGAL DESCRIPTION: CURRENT
PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 93
NO. 4222F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER DISTRICT

MISCELLANEOUS NOTES:
NWPA PLAN 45248 NWPA PLAN 45799

ASSOCIATED PLAN NUMBERS:
PLAN NWP45248
PLAN NWP45799

AFB/IFB: MN: Y PE: 0 SL: 1 TI: 1

TITLE SEARCH PRINT 2018-07-31, 15:00:37

File Reference: 18089 Requestor: Gail Slavik

Declared Value $ 760000

CURRENT AND CANCELLED INFORMATION SHOWN

Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	BB1931165
From Title Number	AE42371
Application Received	2011-02-01
Application Entered	2011-02-04

Registered Owner in Fee Simple

Registered Owner/Mailing Address: HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE MINISTER OF TRANSPORT
C/O VANCOUVER FRASER PORT AUTHORITY, PURSUANT TO SS. 46(1)
100 THE POINTE, 999 CANADA PLACE
VANCOUVER, BC
V6C 3T4

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-308

Legal Description:

PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 78 NO. 4128F) DISTRICT LOT 5 GROUP 2 NEW WESTMINSTER DISTRICT EXCEPT: PARCEL ONE (STATUTORY RIGHT OF WAY PLAN NWP88158)

Legal Notations	NONE
Charges, Liens and Interests	NONE
Duplicate Indefeasible Title	NONE OUTSTANDING
Transfers	NONE
Pending Applications	NONE
Corrections	NONE

TITLE SEARCH PRINT 2018-07-31, 15:00:37

File Reference: 18089 Requestor: Gail Slavik

CURRENT AND CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 172 LAND TITLE ACT SECTION 188 LAND TITLE ACT
Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	AC7145
From Title Number	D9652 626291E
Application Received	1989-01-14
Application Entered	1989-01-27
Title Cancelled	**1991-04-15**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: CANADIAN NATIONAL RAILWAY COMPANY
1150 STATION STREET
VANCOUVER, BC

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-308

Legal Description:

PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 78 NO. 4128F) DISTRICT LOT 5 GROUP 2 NEW WESTMINSTER DISTRICT

Legal Notations NONE

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 1991-04-15
Description: PARCEL ONE (SRW PLAN NWP88158) AE41600

Registration Date:	1991-04-15
Description:	ALL (SECTION 185) AE42371

Corrections NONE

TITLE SEARCH PRINT 2018-07-31, 15:00:37

File Reference: 18089 Requestor: Gail Slavik

Declared Value $N/A

CURRENT AND CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 185 LAND TITLE ACT
Land Title District	NEW WESTMINSTER
Land Title Office	NEW WESTMINSTER
Title Number	AE42371
From Title Number	AC7145
Application Received	1991-04-15
Application Entered	1991-04-15
Title Cancelled	**2011-02-04**

Registered Owner in Fee Simple

Registered Owner/Mailing Address: CANADIAN NATIONAL RAILWAY COMPANY
#1000 - 10004 - 104TH AVENUE
EDMONTON, AB
T5J 0K2

Taxation Authority Surrey, City of

Description of Land

Parcel Identifier: 012-878-308

Legal Description:

PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 78 NO. 4128F) DISTRICT LOT 5 GROUP 2 NEW WESTMINSTER DISTRICT EXCEPT: PARCEL ONE (STATUTORY RIGHT OF WAY PLAN NWP88158)

Legal Notations NONE

Charges, Liens and Interests NONE

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers

Registration Date: 2011-02-04
Description: ALL BB1931165

Corrections NONE

PARCEL IDENTIFIER (PID): 012-878-308

SHORT LEGAL DESCRIPTION:U/NEW WESTMINSTER////2//5/////C
MARG:*12/78/4128F REM
TAXATION AUTHORITY:
1 Surrey, City of

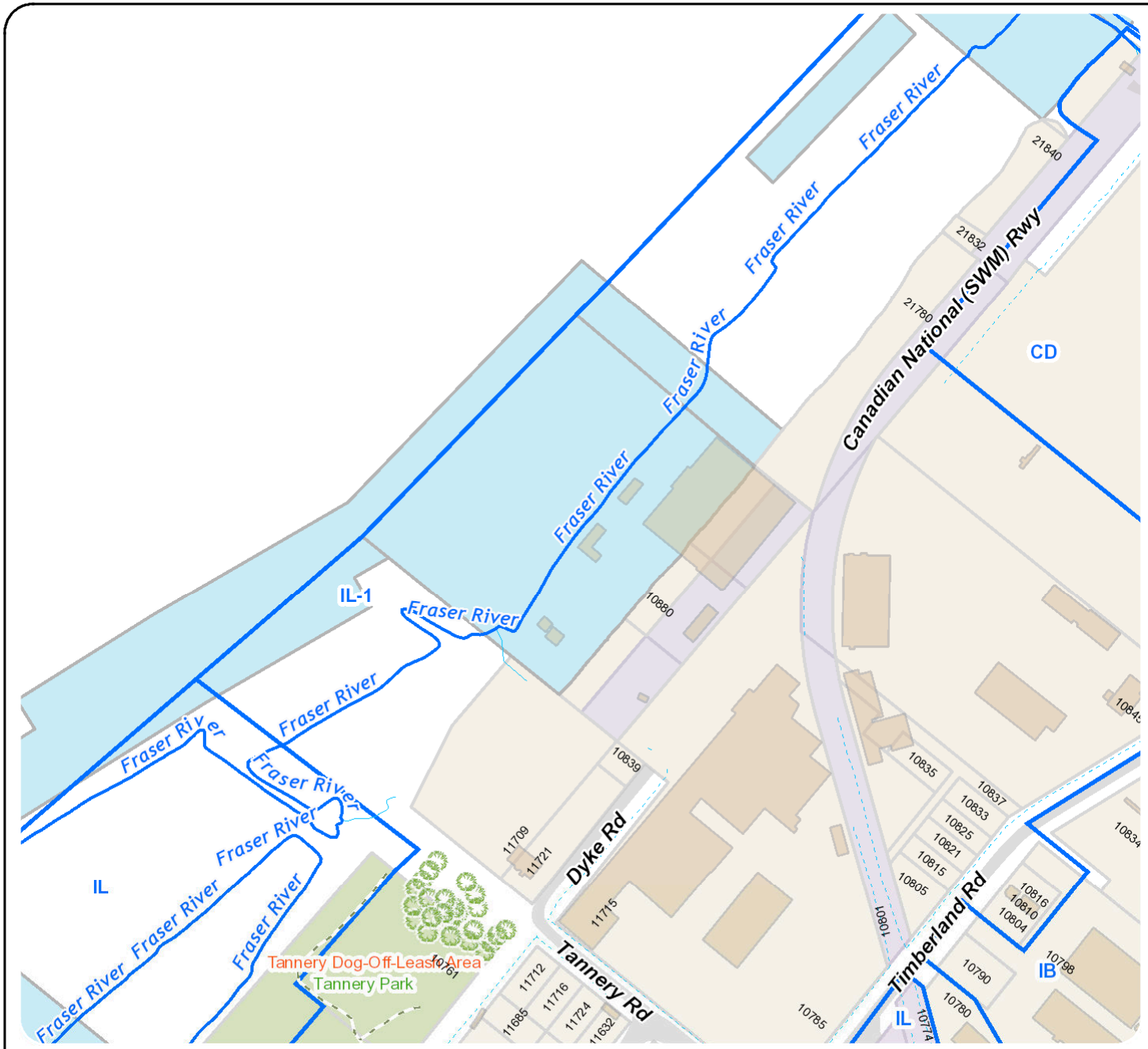
FULL LEGAL DESCRIPTION: CURRENT
PARCEL "C" (PLAN IN ABSOLUTE FEES PARCEL BOOK 12 FOLIO 78
NO. 4128F) DISTRICT LOT 5 GROUP 2 NEW WESTMINSTER DISTRICT
EXCEPT: PARCEL ONE (STATUTORY RIGHT OF WAY PLAN NWP88158)

MISCELLANEOUS NOTES:
SRW PLAN NWP88158
PP BCP48715

ASSOCIATED PLAN NUMBERS:
POSTING PLAN BCP48715
STATUTORY RIGHT OF WAY PLAN NWP88158

AFB/IFB: MN: Y PE: 0 SL: 1 TI: 1

Zoning Map



Enter Map Description

Scale: 1:4,000

0 0.025 0.05 0.1 0.15
km

Map created on: 2018-10-26

Legend

- Park Specimen Trees2000_4000
- Trails and Paths

Water Courses

- River
- Creek
- Ditch
- Zoning Boundaries

Building

- Unknown
- Hospital
- Church
- Shopping Centre
- Other
- Attraction
- Fire
- RCMP
- Justice
- Municipal
- Park
- School
- Library
- Recreation Centre
- Community Centre

Light Impact Industrial 1 Zone

Part 48A IL-1

A. Intent

This Zone is intended to accommodate and regulate the development of *light impact industry* and limited office and service uses with a high standard of design. These uses shall be carried out with limited provision for outdoor storage.

B. Permitted Uses

Land and *structures* shall be used for the following uses only, or for a combination of such uses:

1. *Light impact industry*.

2. *Recycling depots* provided that:

   (a) The use is confined to an enclosed *building*; and

   (b) The storage of used tires is prohibited.

3. *Warehouse uses*.

4. *Distribution centres*.

5. *General service uses* limited to the following:

   (a) Industrial first aid training; and

   (b) Trade schools.

6. Office uses limited to the following:

   (a) Architectural and landscape architectural offices;

   (b) Engineering and surveying offices;

(c) General contractor offices;

(d) Government offices; and

(e) Utility company offices.

7. *Accessory uses* including the following:

(a) *Coffee shops* provided that the seating capacity shall not exceed 35 and the said *coffee shop* is not licensed by the Liquor Control and Licensing Act, R.S.B.C. 1996, chapter 267, as amended;

(b) *Indoor recreation facilities*;

(c) *Community services*;

(d) *Assembly halls* limited to *churches*, provided that:

i. The *church* does not exceed a total floor area of 700 square metres [7,500 sq. ft.];

ii. The *church* accommodates a maximum of 300 seats; and

iii. There is not more than one *church* on a *lot*;

(e) *Child care centres*; and

(f) *Dwelling unit(s)* provided that the *dwelling unit(s)* is (are):

i. Contained within the *principal building*;

ii. Occupied by the owner or a caretaker, for the protection of the businesses permitted;

iii. Restricted to a maximum number of:

a. One *dwelling unit* in each *principal building* less than 2,800 square metres [30,000 sq. ft.] in floor area;

b. Two *dwelling units* in each *principal building* of 2,800 square metres [30,000 sq. ft.] or greater in floor area; and

c. Notwithstanding Sub-sections B.7 (f) iii.a. and iii.b., the maximum number shall be two *dwelling units* for *lots* less than 4.0 hectares [10 acres] in area and three *dwelling units* for *lots* equal to or greater than 4.0 hectares [10 acres] in area; and

iv. Restricted to a maximum floor area of:

a. 140 square metres [1,500 sq. ft.] for one (first) *dwelling unit* on a *lot* and where a *lot* has been subdivided by a strata plan then there shall only be one 140-square metre [1,500 sq. ft.] *dwelling unit* within the strata plan;

b. 90 square metres [970 sq. ft.] for each additional *dwelling unit*; and

c. Notwithstanding Sub-sections B.7(f)iv.a. and iv.b., the maximum floor area shall not exceed 33% of the total floor area of the *principal building* within which the *dwelling unit* is contained.

C. Lot Area

Not applicable to this Zone.

D. Density

Amendments: 19073, 02/20/17

1. In Areas as described and outlined on the maps attached as Schedule F attached to this By-law, the *floor area ratio* shall not exceed 0.1 or a *building* area of 300 square metres [3,230 sq.ft.] whichever is smaller. The *floor area ratio* may be increased to 1.00 if amenities are provided in accordance with Schedule G of this By-law.

2. In areas other than the ones in Sub-section D.1 of this Zone, the *floor area ratio* shall not exceed 1.00.

E. Lot Coverage

The maximum *lot coverage* shall be 60%.

F. Yards and Setbacks

Amendments: 19261, 06/26/17

Buildings and *structures* shall be sited in accordance with the following minimum *setbacks*:

Use / ***Setback***	*Front Yard*	*Rear Yard*	*Side Yard*	*Side Yard* on *Flanking Street*
Principal and *Accessory Buildings* and *Structures*	7.5 m. [25 ft.]	7.5 m. [25 ft.]	7.5 m.* [25 ft.]	7.5 m. [25 ft.]

Measurements to be determined as per Part 1 Definitions of this By-law.

* One (1) *side yard setback* shall be 7.5 metres [25 ft.] or 0.0 metre if the said *side yard* abuts land which is *commercial, mixed employment* or *industrial*.

G. Height of Buildings

Measurements to be determined as per Part 1 Definitions of this By-law.

1. *Principal building:* The *building height* shall not exceed 18 metres [60 ft.].

2. *Accessory buildings* and *structures:* The *building height* shall not exceed 6 metres [20 ft.].

H. Off-Street Parking

Amendment: 18719, 05/30/16

1. Refer to Table C.1, Part 5 Off-Street Parking and Loading/Unloading of this By-law. For the purpose of this Part, the parking requirements for *warehouse uses* and *distribution centres* shall be the same as those for *light impact industry*.

2. *Tandem parking* may be permitted.

3. Parking of *vehicles*, except parking for employees and customers of the uses on the *lot* and including without limitations, parking of *vehicles* exceeding 5,000 kilograms [11,023 lbs.] *G.V.W.*, is specifically prohibited between the front of the *principal building* and the *highway* and shall occupy an area no greater than 1.5 times the area of the *lot coverage* of the *principal buildings*.

4. Notwithstanding Sub-section A.3.(b) of Part 5 Off-Street Parking and Loading/Unloading of this By-law, required parking shall be provided on the same *lot* as the uses they serve.

I. Landscaping

Amendment: 18414, 03/23/15; 19261, 06/26/17

1. All developed portions of the *lot* not covered by *buildings*, *structures*, or paved areas shall be landscaped, including the retention of mature trees. This *landscaping* shall be maintained.

2. Along the developed sides of the *lot* which abut an Arterial Road or Collector Road, as shown in Schedule "D" - Surrey Road Classification Map (R-91) in Subdivision and Development By-law No. 8830, a continuous *landscaping* strip of not less than 6.0 metres [20 ft.] in width shall be provided within the *lot*.

3. Along the developed sides of the *lot* which abut all *highways* other an Arterial Road or Collector Road, as shown in Schedule "D" - Surrey Road Classification Map (R-91) in Subdivision and Development By-law No. 8830, a continuous *landscaping* strip of not less than 3.0 metres [10 ft.] shall be provided within the *lot*.

4. The boulevard areas of *highways* abutting a *lot* shall be seeded or sodded with grass on the side of the *highway* abutting the *lot*, except at *driveways*.

5. A continuous *landscaping* strip of not less than 1.5 metres [5 ft.] in width shall be provided along all *side lot lines* between a *highway* and 3.0 metres [10 ft.] back from the front face of the closest *principal building* fronting a *highway*.

6. A continuous *landscaping* strip of not less than 6.0 metres [20 ft.] shall be provided along all *lot lines* separating the developed portion of the *lot* from any *residential lots*.

7. Loading areas, garbage containers and *passive recycling containers* shall be screened to a height of at least 2.5 metres [8 ft.] by *buildings*, a *landscaping* screen, a solid decorative fence, or a combination thereof.

8. The area for the parking of *vehicles* shall be completely screened to a height of at least 2.5 metres [8 ft.] by *buildings* and/or a decorative fence and/or *landscaping* at least 2.5 metres [8 ft.] high.

J. Special Regulations

1. Area for outdoor display and storage of any containers, goods, materials or supplies shall:

   (a) Not exceed a total area greater than 1.5 times the *lot* area covered by the *principal building* up to a maximum of 40% *lot coverage* of the *lot*;

   (b) Not to be used for storage of trucks (>5,000 kg. *G.V.W.*) or trailers that are not associated with the business on the *lot*;

   (c) Not be located within any *front yard* or *side yard*; and

   (d) Be completely screened to a height of at least 2.5 metres [8 ft.] by *buildings* and/or solid decorative fencing and/or substantial *landscaping* strips of not less than 2.5 metres [8 ft.] in height and not less than 1.5 metres [5 ft.] in width. No display or storage of any material shall be piled to a height exceeding 2.5 metres [8 ft.] within 5 metres [16 ft.] of the said screen. In no case any material, except *shipping* containers, shall be piled to a height of more than 3.5 metres [12 ft.].

2. No display or storage of *shipping* containers shall be piled to a height of more than 7.0 metres [24 ft.] or the height of two stacked containers, whichever is less.

3. Parking, storage or service of trucks and trailers on any portion of the *lot* not associated with the uses or operations permitted in Section B thereof shall be specifically prohibited.

4. Land and *structures* shall be used for the uses permitted in this Zone only if such uses:

   (a) Constitute no unusual fire, explosion or safety hazard;

   (b) Do not emit noise in excess of 70dB(A) measured at any point on any boundary of the *lot* on which the use is located, provided that where a *lot* abuts a *lot* other than an *industrial lot* the noise level shall not exceed 60dB(A); and

   (c) Do not produce heat or glare perceptible from any *lot line* of the *lot* on which the use is located.

5. Loading areas, garbage containers and *passive recycling containers* shall not be located within any required front or *flanking street setback* or within any required *setback* adjacent any *residential lot*.

6. *Child care centres* shall be located on the *lot* such that these centres have direct access to an *open space* and play area within the *lot*.

K. Subdivision

Lots created through subdivision in this Zone shall conform to the following minimum standards:

***Lot* Size**	***Lot* Width**	***Lot* Depth**
1,800 sq. m [0.5 acre]	30 metres [100 ft]	30 metres [100 ft.]

Dimensions shall be measured in accordance with Section E.21, Part 4 General Provisions, of the Surrey Zoning By-law, 1993, No. 12000 as amended.

L. Other Regulations

Amendments: 17181, 06/07/10; 17471, 10/03/11

In addition, land use regulations including the following are applicable:

1. Prior to any use, lands must be serviced as set out in Part 2 Uses Limited, of this By-law and in accordance with the Surrey Subdivision and Development By-law, 1986, No. 8830, as amended.

2. General provisions on use are as set out in Part 4 General Provisions, of this By-law.

3. Additional off-street parking requirements are as set out in Part 5 Off-Street Parking and Loading/Unloading of this By-law.

4. Sign regulations are as provided in Surrey Sign By-law, 1999, No. 13656, as amended.

5. Special *building setbacks* are as set out in Part 7 Special Building Setbacks, of this By-law.

6. Floodproofing regulations are as set out in Part 8 Floodproofing, this By-law.

7. *Building* permits shall be subject to the Surrey Building By-law, 1987, No. 9011, as amended, and the Surrey Development Cost Charge By-law, 2002, No. 14650, as amended.

8. Surrey Tree Preservation By-law, 1996, No. 12880, as amended.

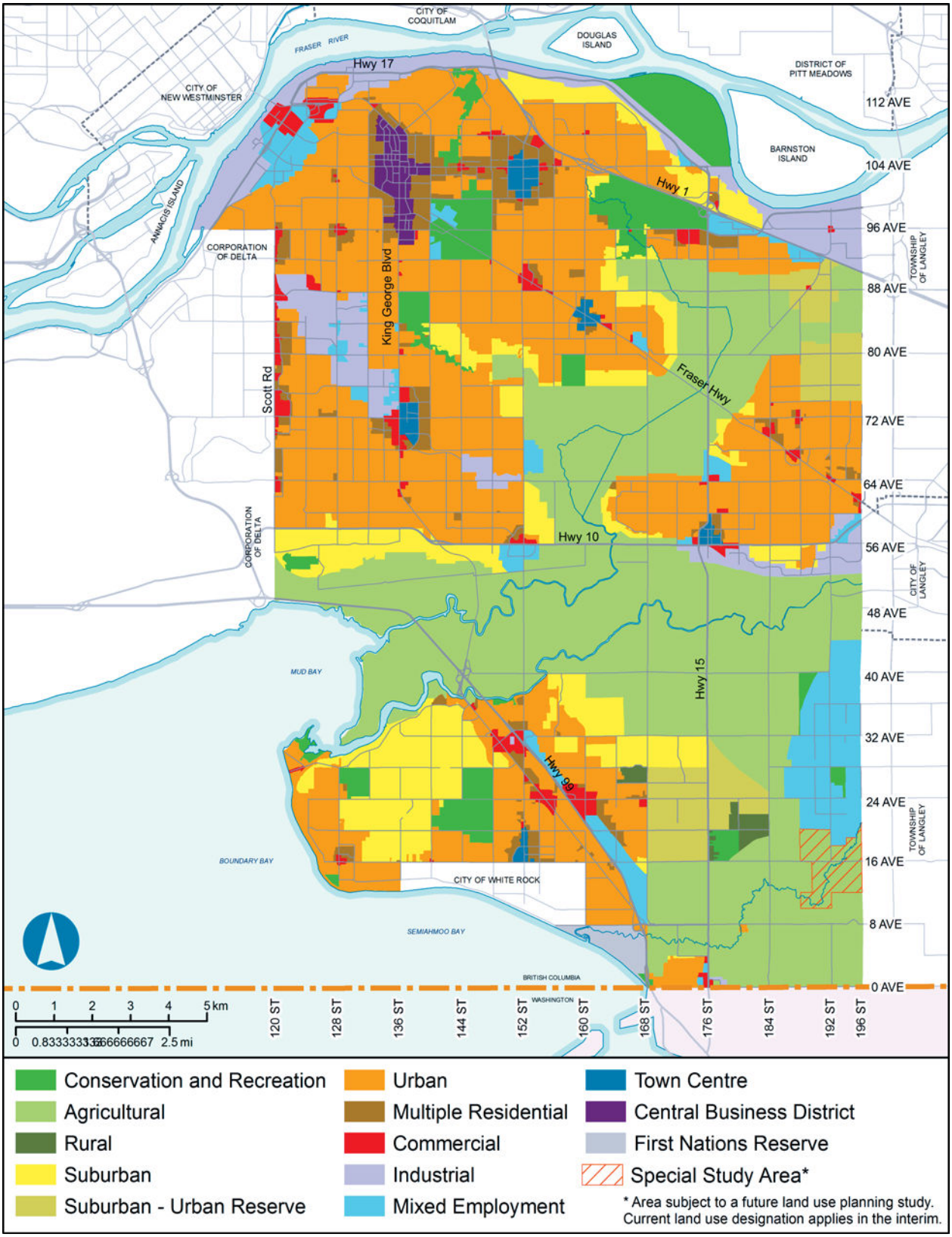
9. Development permits may be required in accordance with the *Official Community Plan*, as amended.

10. Safety regulations are as set out in the Health Act R.S.B.C. 1996, c. 179 and the "Surrey Fire Prevention By-law".

11. Permits may be required for the storage of *special wastes* in accordance with the Environmental Management Act R.S.B.C., 2003, C.53.

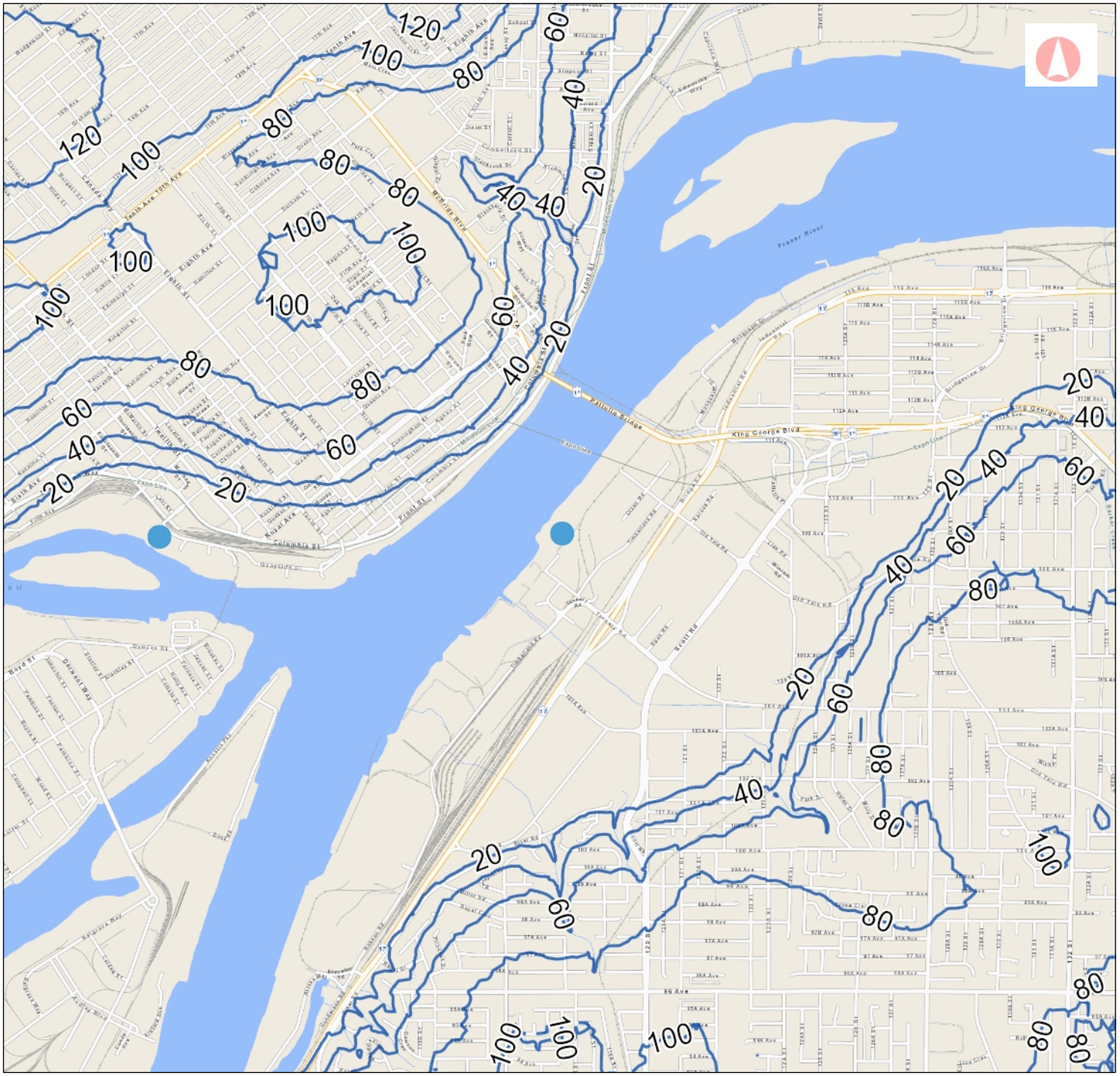
12. Provincial licensing of *child care centres* is regulated by the Community Care and Assisted Living Act, S.B.C., 2002, c.75, as amended and the Regulations pursuant thereto including without limitation B.C. Reg. 319/89/213.

Figure 3: General Land Use Designations



APPENDIX C

PHYSICAL SITE INFORMATION



BRITISH COLUMBIA

Contour Map

Legend

- Contours - (1:20,000)
- Contours - Labels (1:20,000

0 1.02 2.03 km

1: 50,000

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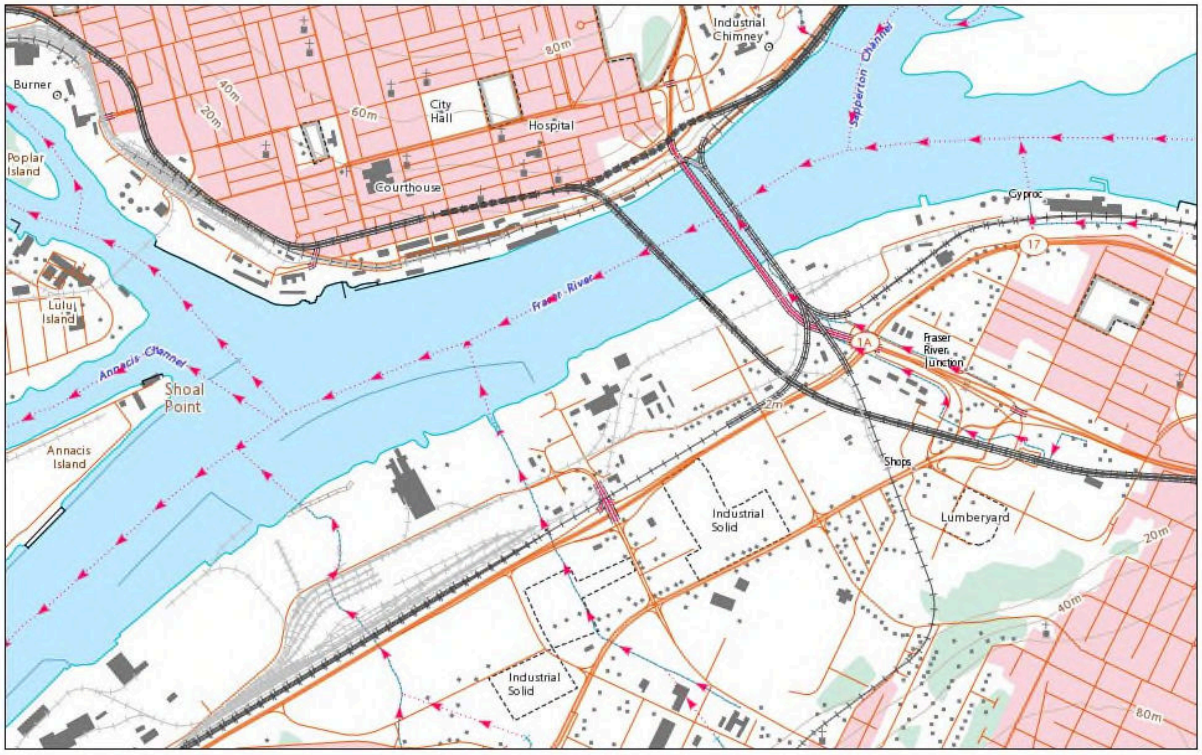
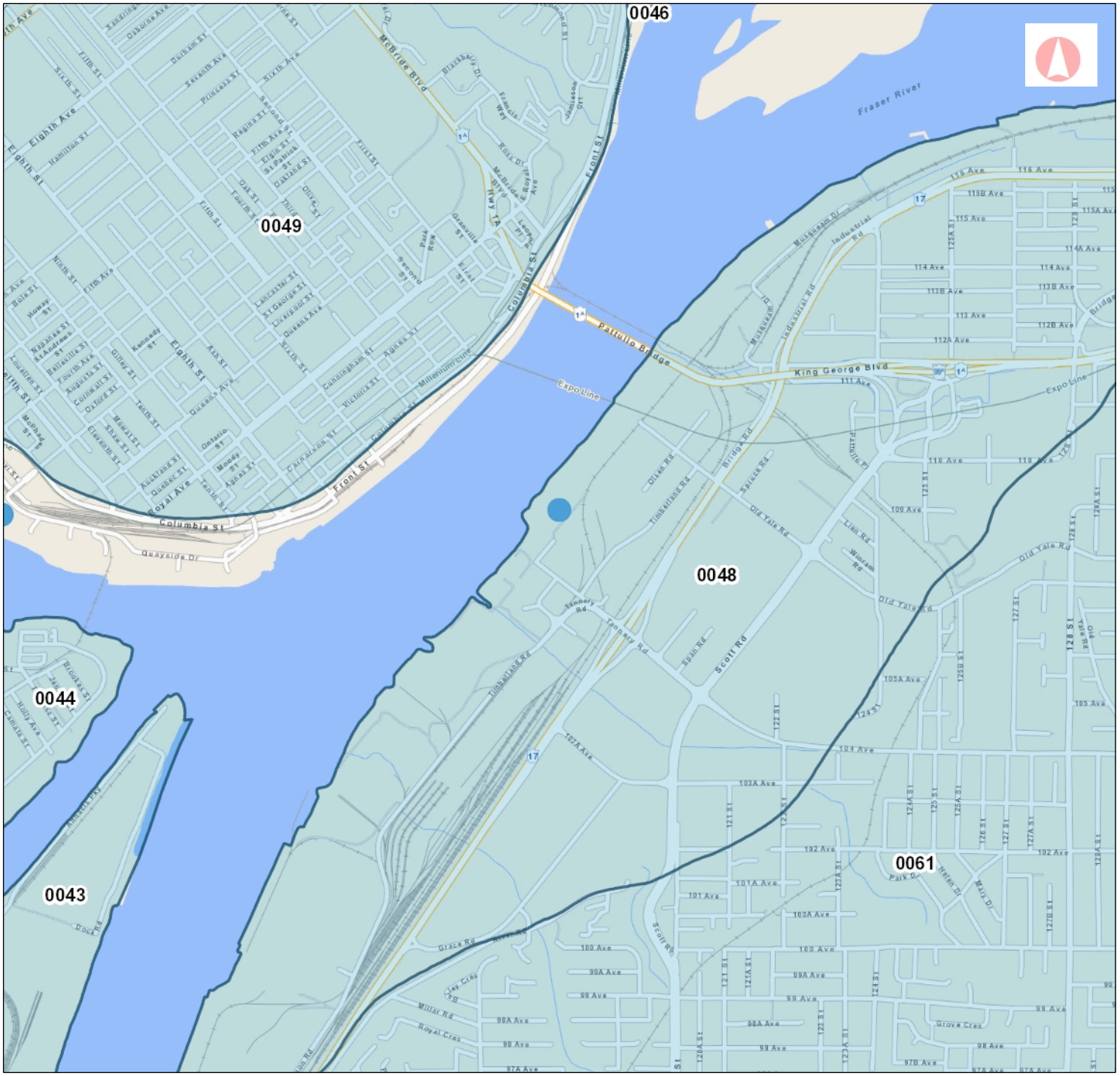
Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia

Toporama





BRITISH COLUMBIA

Aquifer Map

Legend

- Aquifers - BC - Outlined

0 0.73 1.47 km

1: 36,112

Copyright/Disclaimer

Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia

AQUIFER CLASSIFICATION WORK SHEET

DATE: October 18, 2007

AQUIFER MAPPER:

AQUIFER LOCATION: Fraser River Junction

AQUIFER NUMBER: 0048

NTS MAP SHEET: 092G/2

BCGS TRIM Maps (1:20,000):

CLASSIFICATION: III B **RANKING: 8**

Aquifer Size: 8 km^2

Aquifer Boundaries:

Geologic Formation (overlying):

Geologic Formation (aquifer): Fraser River Sediments. Floodplain..

Major Aquifer System Type: 1a. Predominantly unconfined fluvial or glaciofluvial aquifers along major higher stream order river valleys influenced by surface water lower E sand aquifers)

Confined/Unconfined: Unconfined to confined

Vulnerability: Moderate

Productivity: Moderate

Depth to Water Table: Depth to water values for 3 wells range from 14 ft to 4 ft with a geometric mean of 9 ft. The median and average depth to water is 13 ft and 10 ft respectively.

Direction of Groundwater Flow:

Recharge:

Domestic Well Density:

Type of Water Use: Other. Limited development.

Reliance on Source: Demand on the aquifer is low.

Conflicts Between Users:

Quantity Concerns (type, source, level of concern): None documented

Quality Concerns (type, source, level of concern): None documented.

Comments:

Worksheet prepared by Erin Park, from information in *Copy of Aquiferdatbase w attributes sep-12-07 (ep).xls*. Prepared on October 18, 2007.

References:

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Fraser River Junction

AQUIFER NUMBER: 0048

CLASSIFICATION: III B **RANKING VALUE: 8**

Classification Component:

Level of Development: Low

Level of Vulnerability: Moderate

Ranking Component:

	Ranking Value
Productivity:	**2**
Vulnerability:	**2**
Size:	**2**
Demand :	**1**
Type of Use:	**1**
Quality Concerns:	**0**
Quantity Concerns	**0**
Total:	**8**

Statistical Summary of Well Record Data for Aquifer # 0049

	Well Depth (ft)	***Depth to Water (ft)***	***Depth to Bedrock (ft)***	***Reported Well Yield (gpm)***
Number of Wells	22	14	0	9
Maximum	400	285	UNK	202
Minimum	35	17	UNK	1
Average	191	153	UNK	49
Median	200	151	UNK	25
Geometric Mean	156	120	UNK	20

BRITISH COLUMBIA

Water Wells Map

Legend

- Water Wells - All

0 0.41 0.81 km

1: 20,000

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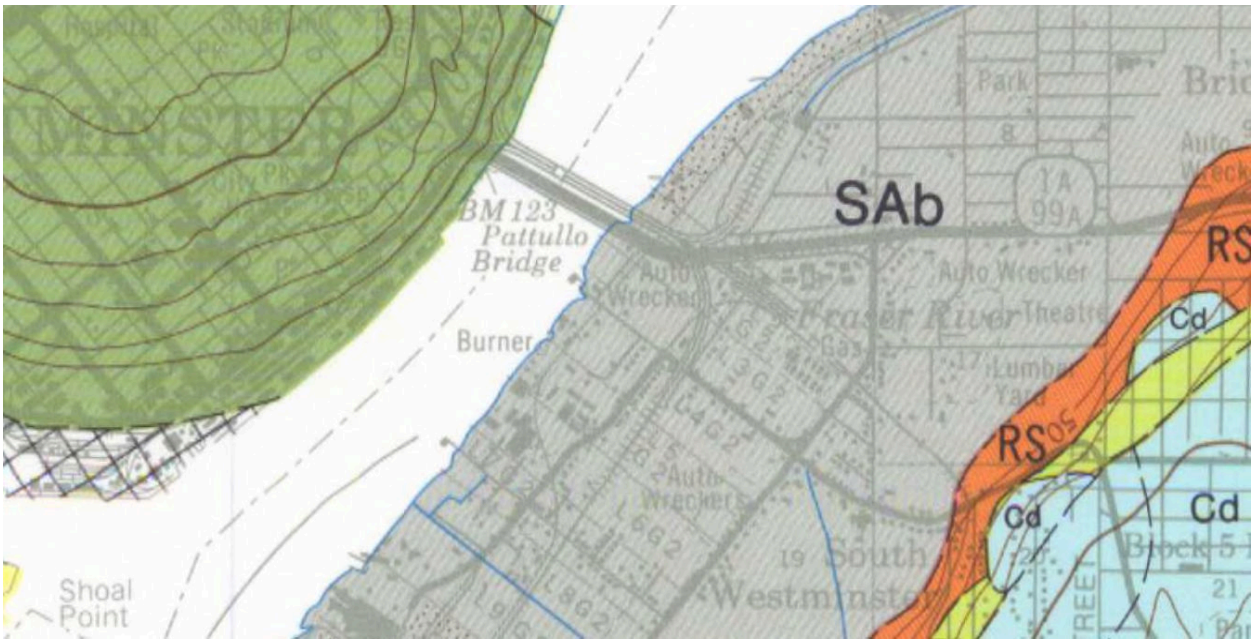
Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia

Surficial Geology Notes

Reference: Geological Survey of Canada, Department of Energy, Mines and Resources, Map 1484A, Surficial Geology New Westminster, British Columbia, 1980

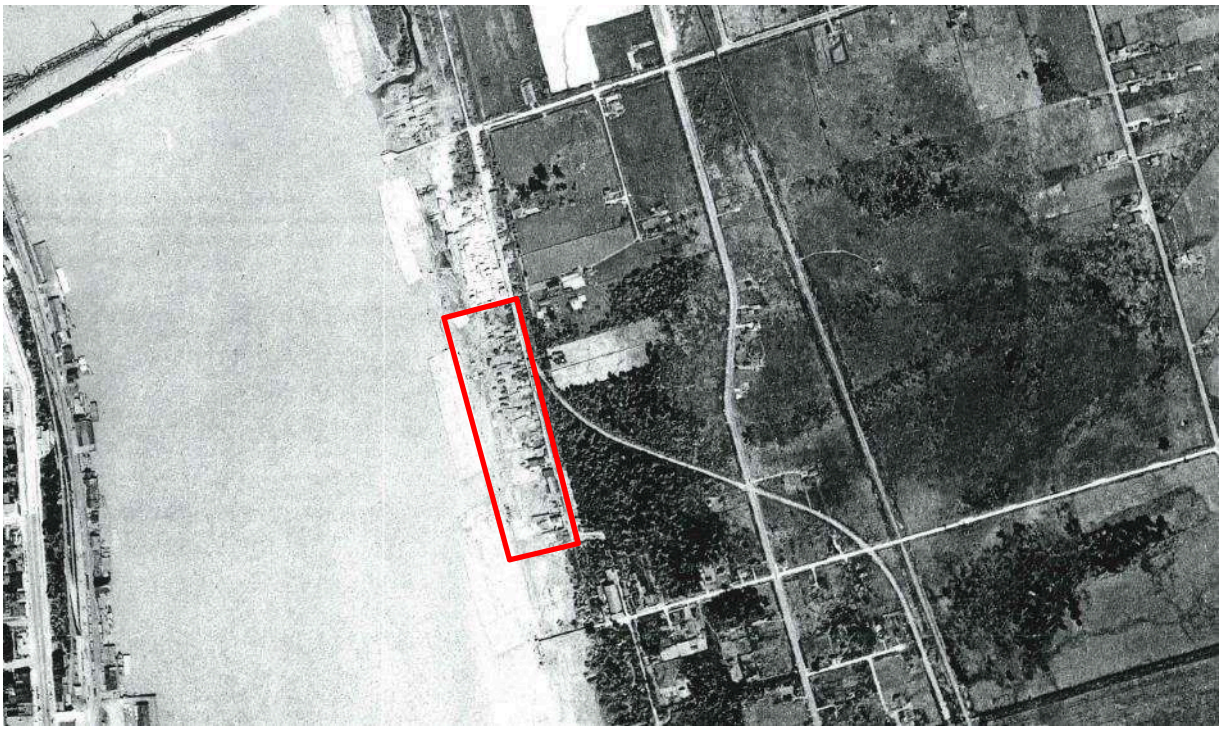


SAb-e

Bog, swamp, and shallow lake deposits: SAb, *lowland peat up to 14 m thick, in part overlying* Fb, c; SAc, *lowland peat up to 1 m thick underlying* Fb *(up to 2 m thick);* SAd, *lowland organic sandy loam to clay loam 15 to 45 cm thick overlying* SAg *and* Fd; SAe, *upland peat up to 8 m or more thick*

APPENDIX D

SELECT AERIAL PHOTOGRAPHS



Aerial Photo 1.	**The general area of the Site in 1938.**	**Source: UBC GIC**

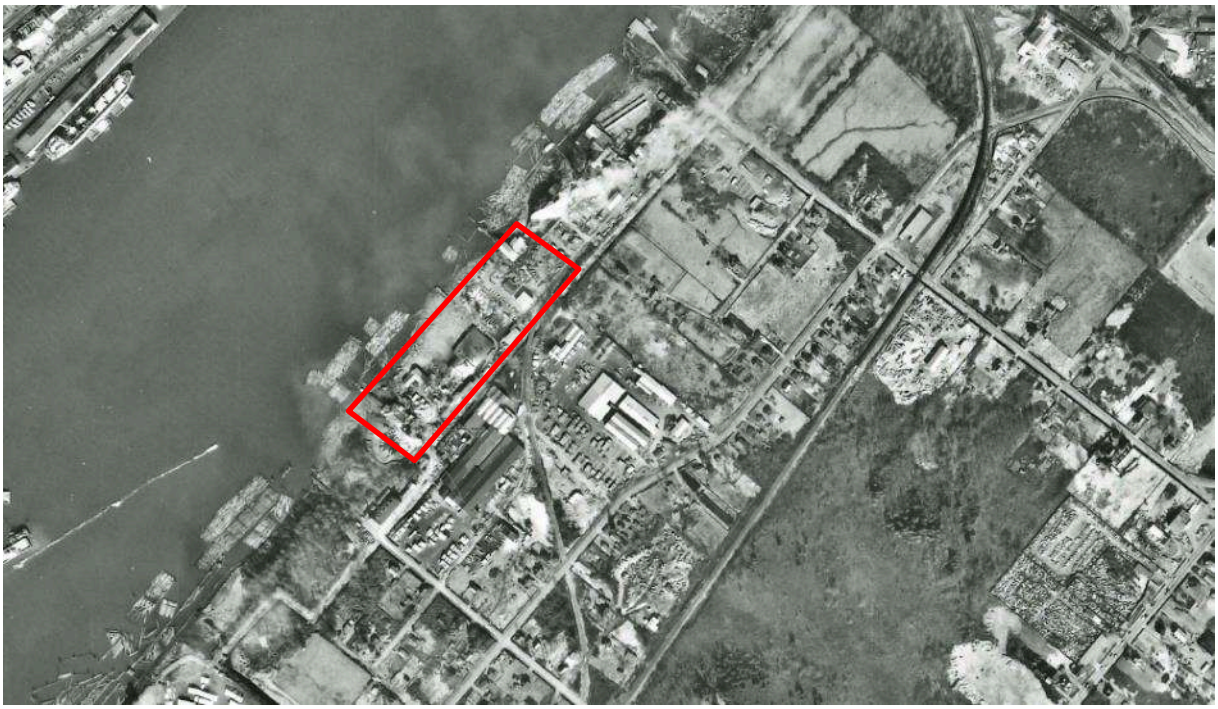
Aerial Photo 2.	**The general area of the Site in 1949.**	**Source: UBC GIC**

Aerial Photo 3.	**The general area of the Site in 1951.**	**Source: UBC GIC**

Aerial Photo 4.	**The general area of the Site in 1954.**	**Source: UBC GIC**

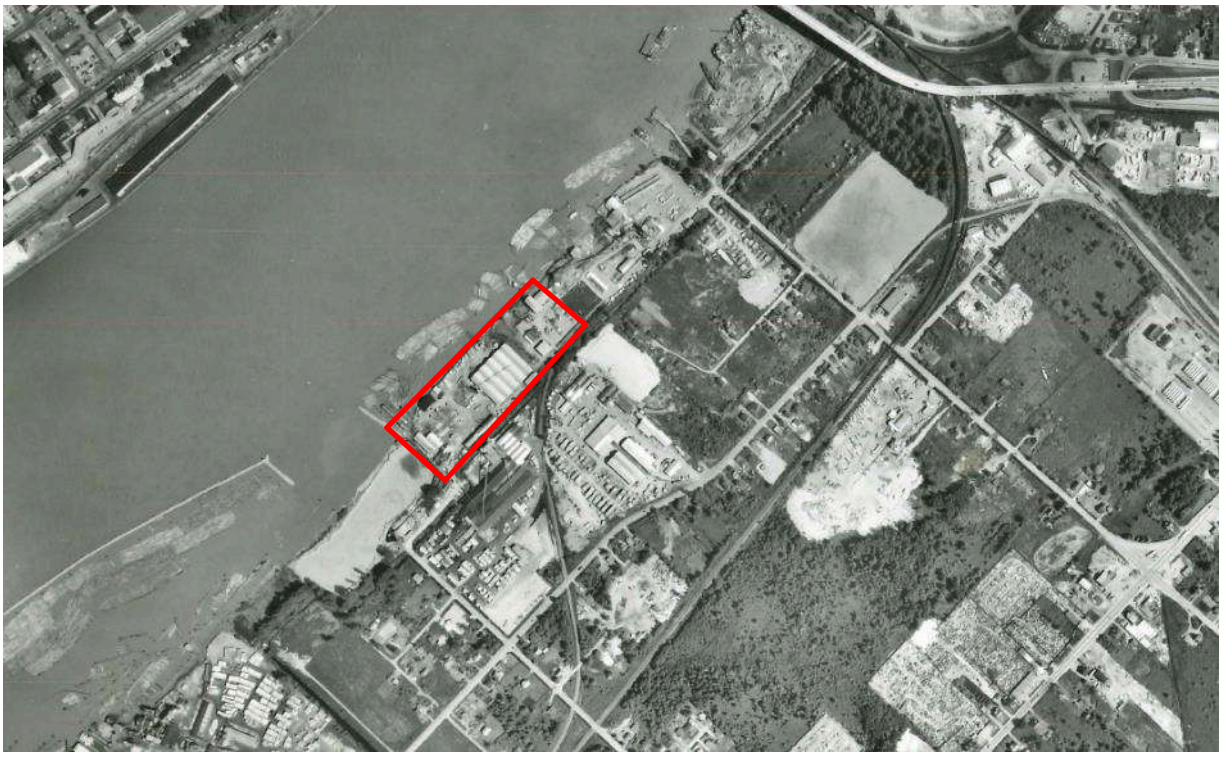
Aerial Photo 5.	**The general area of the Site in 1963.**	**Source: UBC GIC**

Photo 5 Zoom	**Close-up of suspect aboveground storage tank (AST) in vicinity of APEC #34 (AEC-1) in 1963.**	**Source: UBC GIC**



Aerial Photo 6.	**The general area of the Site in 1969.**	**Source: UBC GIC**

Photo 6 Zoom	**Close-up of suspect aboveground storage tank (AST) in vicinity of APEC #34 (AEC-1), still present in 1969.**	**Source: UBC GIC**



Aerial Photo 7.	**The general area of the Site in 1974.**	**Source: UBC GIC**

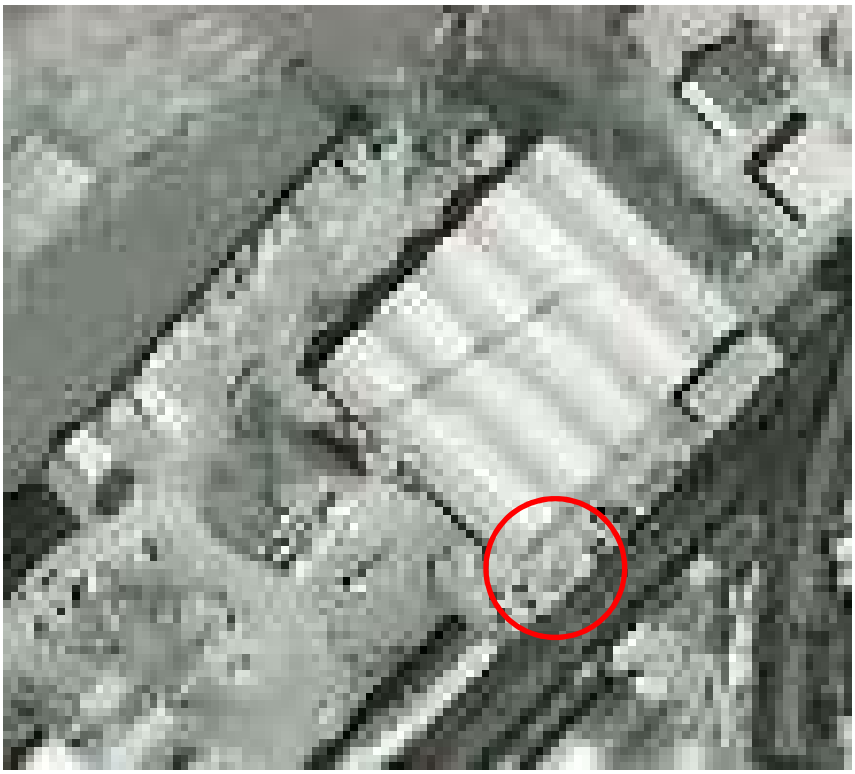


Photo 7 Zoom	**Suspect AST no longer present in 1974. Site layout has changed (distribution warehouse has been built).**	**Source: UBC GIC**

Aerial Photo 8.	**The general area of the Site in 1982.**	**Source: UBC GIC**

Aerial Photo 9.	**The general area of the Site in 1986.**	**Source: UBC GIC**

Aerial Photo 10.	**The general area of the Site in 1991.**	**Source: UBC GIC**

Aerial Photo 11.	**The general area of the Site in 1997.**	**Source: UBC GIC**

Aerial Photo 12.	**The general area of the Site in 2002.**	**Source: UBC GIC**

Aerial Photo 13.	**The general area of the Site in 2004.**	**Source: COSMOS**

Aerial Photo 14.	**The general area of the Site in 2005.**	**Source: COSMOS**

Aerial Photo 15.	**The general area of the Site in 2006.**	**Source: COSMOS**

Aerial Photo 16.	**The general area of the Site in 2007.**	**Source: COSMOS**

Aerial Photo 17.	**The general area of the Site in 2008.**	**Source: COSMOS**

Aerial Photo 18.	**The general area of the Site in 2009.**	**Source: COSMOS**

Aerial Photo 19.	**The general area of the Site in 2010.**	**Source: COSMOS**

Aerial Photo 20.	**The general area of the Site in 2011.**	**Source: COSMOS**

Aerial Photo 21.	**The general area of the Site in 2012.**	**Source: COSMOS**

Aerial Photo 22.	**The general area of the Site in 2013.**	**Source: COSMOS**

Aerial Photo 23.	**The general area of the Site in 2014.**	**Source: COSMOS**

Aerial Photo 24.	**The general area of the Site in 2015.**	**Source: COSMOS**

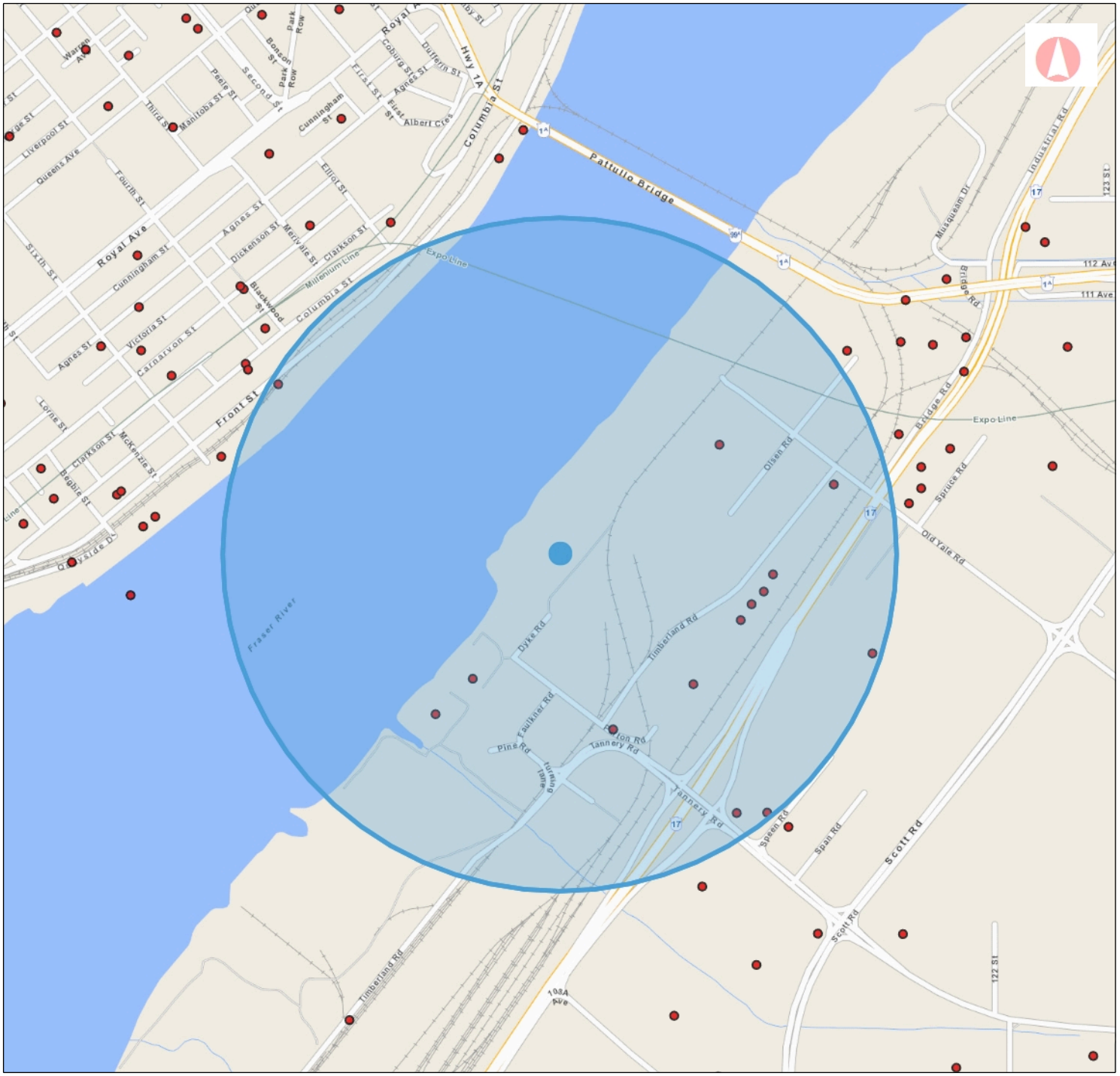
Aerial Photo 25.	**The general area of the Site in 2016.**	**Source: COSMOS**

Aerial Photo 26.	**The general area of the Site in 2017.**	**Source: COSMOS**

Aerial Photo 27.	**The general area of the Site in 2018.**	**Source: COSMOS**

APPENDIX E

PROVINCIAL DOCUMENTS



BRITISH COLUMBIA

Site Registry Map

Legend

- Environmental Remediation

0 0.37 0.73 km

1: 18,056

Copyright/Disclaimer

CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.

Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia

```
 As of: OCT 21, 2018       BC Online: Site Registry                    18-10-25
                      For: PE85113  ENVIROCHEM SERVICES INC.           14:06:57
 Folio: 18089                                                          Page   1
                                    Detail Report
SITE LOCATION
       Site ID:       6114                          Latitude:  49d 12m 10.1s
 Victoria File:                                    Longitude: 122d 53m 32.1s
 Regional File: 26250-20/6114
        Region: SURREY, LOWER MAINLAND

 Site Address: 11940 OLD YALE ROAD
         City: SURREY                         Prov/State: BC
  Postal Code: V3V 3X3

 Registered: AUG 16, 1999  Updated: MAY 19, 2006  Detail Removed: MAY 19, 2006

 Notations:   1   Participants:   2    Associated Sites:   0
 Documents:   0 Susp. Land Use:   0 Parcel Descriptions:   1

Location Description: PORTABLE GPS UNIT USED TO OBTAIN LAT/LONG

Record Status: NOT ASSIGNED
 Fee category: UNRANKED

 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
NOTATIONS

  Notation Type: SPILL REPORTED
 Notation Class: ADMINISTRATIVE
      Initiated: JUL 11, 1999                        Approved: JUL 11, 1999

 Ministry Contact: SUNDHER, AVTAR

 Notation Participants                               Notation Roles
 FRASER RIVER R V PARK INC. (SURREY)                 SUBMITTED BY

 Note: DIESEL SPILL REPORTED ON-SITE AT RV SITE 44

 Required Actions: SPILL IMPACTED APPROX. 20' X 30' AREA.  IMPACTED SAND/SOIL
 EXCAVATED TO HARDPAN (1.5' BELOW SURFACE)  SOIL TO BE SENT FOR DISPOSAL.
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
SITE PARTICIPANTS
```

Participant: FRASER RIVER R V PARK INC. (SURREY)
Role(s): PROPERTY OWNER
Start Date: JUL 11, 1999 End Date:

- -

Participant: SUNDHER, AVTAR
Role(s): MAIN MINISTRY CONTACT
Start Date: JUL 11, 1999 End Date:

= =

PARCEL DESCRIPTIONS

Date Added: JUN 05, 2000 Crown Land PIN#:
LTO PID#: 003464547 Crown Land File#:
Land Desc: LOT 1 EXCEPT: PART DEDICATED ROAD ON PLAN LMP3759,DISTRICT LOTS

PARCEL DESCRIPTIONS

4 AND 5 GROUP 2 NEW WESTMINSTER DISTRICT PLAN 71190

No activities were reported for this site

End of Detail Report

APPENDIX F

PREVIOUS ENVIRONMENTAL REPORTS

COPY

ENVIRONMENTAL AUDIT REPORT

Brownsville/Port Mann
CN Land Swap
Surrey, BC

for

1996
Oil Contamination

Realty Services,
PWGSC
Pacific Region

by

ENVIRONMENTAL SERVICES
Public Works & Government Services Canada
Pacific-Western Region
BC/Yukon Division

August 23, 1996

Project - 762429

Project Manager - Ron Neumeyer

EXECUTIVE SUMMARY

BROWNSVILLE

Aerial Photography

Review of air photography records indicates that the property has been in use by lumber milling operators for at least thirty years. Although the property north of the Lindal operation is now a vacant area, it was, until the early 1980's, the site of an active mill. However, the photographs seem to indicate that for the most part, the subject parcels were used for the storage of milled products and supplies. *Therefore, there is no reason to suspect significant soil contamination in these areas.*

BC Research (1991)

BCR conducted a chemical assessment of the soils in the parcels on behalf of the Fraser River Harbour Commission in 1991 (Project # 2-31-305). One hole was drilled on each parcel to a maximum depth of 0.75 metres. Twelve samples were analyzed. Metals, PAH and phenols were below industrial levels except for one subsample in parcel A in which the phenol value exceeded Level C. As a consequence eight additional samples were taken from this parcel at depths to 0.25 metres. As all test results were below industrial levels, BCR concluded that the original high value was a very localized situation, or possibly a laboratory procedural error. *In all they found no evidence of soil contamination above industrial levels.*

Klohn-Crippen - Preliminary Geotechnical and Environmental Assessments Report

The consultant included a recommendation for further investigation to delineate one area where oil and grease values exceeded provincial remediation criteria. However, this type of recommendation is common. The potential affected, area is very localized and is not likely to be a costly remediation. Consequently, this issue could be left until the property is developed. Further testing could be included along with other engineering work as part of the process of securing building permits from the District of Surrey. To keep costs down, soil remediation, if needed, could be done during construction when the necessary equipment would be on the site.

Conversations Individuals Having Knowledge of Past Operations

The Pentachlorophenol (PCP) dip-tank was located outside the boundaries of parcel 7 near the tracks and Old Mill Road. The surface below the tank was asphaltic concrete and treated products were generally stored at various locations south of the tracks, well away from the subject property. *Consequently, there is no reason to suspect PCP contamination of soil on the parcels 7&8.*

Drainage

No significant were problems noted.

Buildings, Structures, Materials and Equipment

Land use history for these parcels suggests that there may be some insignificant localized pockets of hydrocarbon contamination. There is no evidence to suggest significant contamination soil from metals, PCB or PCP.

Surrounding Land Use

There is no evidence of significant risk of soil contamination due to surrounding third party operations, most of which are inland of the dyke.

Environmental Sensitivity

The auditor (a biologist) did not find any evidence of unique terrestrial habitats on, or near the subject properties. The Fraser River Estuary Management Program (FREMP) has completed mapping of the waterfront in respect to fish habitat value. *The waterfront opposite the subject properties have been found to have medium to low productivity fish habitat potential and, consequently, some development of this frontage should be permissible (subject on the easterly side to satisfactory habitat mitigation or compensation).*

Sand piles

Piles of sand fill, with some metal debris were found in the central section of parcel C, just north of the beginning of the old Brownsville spur. The source of these piles could not be determined, but may have resulted from excavations during the decommissioning of the wood mill originally located here, or opportunistic disposal by local contractors. *No environmentally hazardous debris was found in the surface of these piles.*

Oil stained soil near Brownsville Spur

South west of the sand piles was a small patch of open ground with some dark oil stains (an oily odour). A small machine may have been serviced here, or some waste oil discarded after servicing in other locations. It is likely that the soil for a short distance below this spot may be contaminated with hydrocarbon residues. Because this is a relatively small, localized spot several hundred metres from the river there is no immediate threat to environmental resources or human health. Bioremdiation (possibly accelerated by the addition of high nitrogen liquid fertilizer) should remove most of the residue over the next few years. *If company staff is responsible, they should be advised to discontinue waste oil disposal in this area. Such oil and lubricant should be collected in a proper container and recycled.*

Oil shed soil

Oil staining was noted along the south side of the oil shed below the drums stored along the outside wall. In addition stained soil was evident below the elevated floor *(see the following section for further discussion on this matter)*.

Hazardous Materials & Wastes

The company stores oil and diesel fuel in a wood building located in the south east section of parcel A. It would prudent to replace the old oil storage building with a modern one, designed for such storage, and remediate the underlying soils. If this is not done, the contamination problem will likely continue and the level of soil contamination will remain, or possibly become more serious.

Storage Tanks - No storage tanks were found.

PORT MANN SITE

1991 B.C. Research CN Port Mann Site Assessment Report

The consultant points out that some soil contamination is to be expected given the past use of portions of the property for rail lines and, in respect to parcel 6, a sawmill (although presently this is limited to log storage). Parcel 1 is leased from CN by International Forest Products which has used a variety of antisapstain chemicals over the years. Although the lease is now paved, the consultant expressed the concern that some of these chemicals may have migrated from treated wood into underlying soil before the pavement was installed.

1992 PWC, Property Transfer Assessment Checklist

No significant issues were noted.

Present Day and Projected use of the Property

The majority of the developed property is being used on a daily basis by CN for rolling stock, and the temporary parking and shuttling of rail cars. It appears that only a small portion of the lower section of the CN yard actually occupies the subject parcels. Rolling stock is cleaned on lines which cross the subject parcels, nor are waste materials from rail cars deposited on these parcels. Dust control on the private CN access road and rail line does not involve the use of oil, or other liquids that could result in soil contamination.

International Forest Products leases parcel 1 from CN. The company presently uses NP1 antisapstain for wood destined for Japan. Some of these products may be stored on the paved lease from time to time. However,

the company is monitoring stormwater runoff in accordance with the BC *Antisapstain Chemical Regulation* and has found the NP1 values to be consistently below the allowed limits.

The remaining sections of the parcels are either undeveloped riparian land or devoted to environmentally benign uses such as small moorages, and marinas, and chip loading facility (for the former BC Hydro thermal generating plant located just west of the property).

Environmental issues

Environmental issues identified thus far do not impede the continued use of these parcels for present commercial purposes. Operations presently carried out on these parcels are not likely to have significant adverse effects on environmental resources in the surrounding area.

TABLE OF CONTENTS

ENVIRONMENTAL SERVICES - Ron Neumeyer
Pacific Region - PWGSC - ☎ (604) 623-6386 Fax: (604) 623-6239

INTRODUCTION

Real Property Services Directorate (RPS), Public Works and Government Services Canada (PWGSC), retained the Environmental Services Unit (ESU), PWGSC, to conduct an environmental audit of two groups of properties included in a land exchange with Canadian National Rail (CN). The audit was completed according to terms and conditions discussed in the body of this report.

Mandate

The audit was undertaken to identify any significant environmental circumstances associated with the subject properties. Details of each are provided later in this report, however the following outlines the respective audit objective for each location:

The Port Mann Site

- This property is presently owned by the federal Crown and will be transferred to CN. CN assumes total liability for any and all soil contamination *therefore only current operations on the specific parcels were assessed* re: the *Canadian Environmental Assessment Act* (CEAA)

- This property is mostly filled river bed and has been used by CN for many years. The property is referred to in this report as the Port Mann Site

The Brownsville Site

- The federal Crown will be acquiring title and therefore assuming some responsibility for any contamination that may be present, or that may occur in the future. Therefore, historical use and current operations were examined by the audit process.

- These parcels are referred to in this report as the Brownsville Site.

Contamination

This word is used at various points in the text of this report. When employed by the author it is understood to mean parameter values in excess of the commercial/industrial levels found in the 1995 edition of "*Criteria for Managing Contaminated Sites in B.C.*"(CMSC) or at levels that may contravene the *B.C. Special Waste Regulation*. It should be noted that the former reference is a guideline and as such is not law, the latter on the other hand, arises from an Act of the Legislature, although its application to soil is still under discussion.

Logistics

The RPS contact was Joe Gormley. The audit was conducted by Ron Neumeyer, Environmental Operations Manager, ES, PWGSC. The site inspections took place during the week of July 7, 1996. A list of persons or agencies contacted during the course of this audit is provided in the table below;

Key Contacts - Brownsville Site

Name	Title	Phone/Fax/Cel
Dave Trenholme	Warehouse Supervisor. Lindal Cedar Holmes	580-1191/1810/-
Bill Godfrey	worked for Brown Lee Industries	421-8887/6084
JoseGomez	Mill Superintendent, Lindal Cedar	580-1191/1810
Russ Cameron	Mill Supervisor, Lindal Cedar	580-1191/1810

Assumptions & Limitations

This report was prepared at the request of RPS, for the purpose of obtaining information on potential environmental issues associated with the properties described in this report. The information contained herein is presented without prejudice. Any uses of this report by a third party, or any reliance on, or decisions to be made based on it, are the responsibility of such parties. Environmental Services and the Government of Canada accept no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report. In evaluating the property, Environmental Services has relied in good faith on information provided by others and therefore cannot accept responsibility for any deficiency, statements, or inaccuracies contained in this report as a result of interpretation of data provided by others.

Ron Neumeyer
Environmental Operations Manager, A&E Services

SECTION 1 - BROWNSVILLE REPORT

1.0 BACKGROUND

The legal description and related municipal data on the subject parcels are taken from the D.G Pateman appraisal report. The six parcels (C is partitioned but is considered as a single parcel in this audit), ranging between 0.2 and 0.6 hectares in area, and are located a short distance west of the Patullo Bridge along the south west shore of the Fraser River. While these are legally considered to be waterfront parcels, physically the parcels do not directly front the river, and are therefore considered to be "semi-waterfront" sites. Figure 1.1 illustrates the general layout and location of the subject parcels. Parcels A, B and a large portion of C are presently occupied by Lindal Cedar Homes Ltd. The remaining parcels, 7 & 8, are not in use (as discussed later this was the site of a mill, since dismantled).

1.1 Development History

1.1.1 Aerial Photography

A series of air photographs was obtained from the UBC Geography Department and the District of Surrey. Examination of these images provided the following information:

Years (source id.)	Comments/observations
1938 (H5938-34)	There is no industrial development on the subject land. There are numerous house size buildings in parcels B and C, likely homes and storage facilities for the fishing community; no milling operations are evident; the Brownsville Spur is in use; the area inland of the subject parcels is either woods or farmland.
1946 (A10297-128)	The image is of poor quality but shows that many of the earlier structures have disappeared; industrial development is beginning in parcels 7&8 and a building can be seen in parcel A; logs are boomed at the low water line; the spur does not appear to be in use.
1952 (BC1632:20)	A poor quality image, all that can be confirmed is that parcel A now has a more substantial structure which has expanded into parcel B.
1962 (District of Surrey)	The Brownsville mill has been constructed and portions of the main building lie within parcels A & B and a section of C; most of C is undeveloped with some wood storage near the beginning of parcel 8; considerable quantities of logs are boomed at the shoreline; parcel 7 is being used for wood storage; inland properties are now under development as milling operations or related industries.

Years (source id.)	Comments/observations
1963 (UBC no code)	Most of the subject properties are free of any significant structures although the mill building still occupies most of parcels A & B; there are some small buildings or stored logs throughout all of the remaining parcels, in particular parcels 7&8.
1966 (Surrey)	Parcels A&B are unchanged; parcel C now has two buildings in the south end and the remainder is in use for wood storage, most of parcels 7&8 are devoted to log and lumber storage; large milling operations exist immediately across the tracks (south) from the subject property.
1970 (Surrey)	No significant change apparent.
1971 (BC5406:181)	The mill on parcels A&B has been removed; the first stage of the existing Lindal Cedar storage shed has been constructed in parcel C, and the two early buildings remain; development in parcels 7&8 has not changed noticeably.
1973 (Surrey)	The existing Lindal dry storage shed is now present, a portion of which is located in parcel C; the two easterly buildings remain; other uses of the subject parcels have not changed significantly from 1971, although the mill has added some buildings in and around parcel 7; the large upland mills remain and have increased in size
1978 (Surrey)	Parcels A, B and C appear much as they do today (a larger green chain has been added); parcels 7&8 are still in use by the Brown Lee Industries Douglas fir mill; extensive industrial development is now prevalent inland from the subject land.
1984 (Surrey)	Parcels A and B are largely unchanged. However, the Brown Lee mill has been removed from parcels C, 7 and 8 (the area is essentially clear of all buildings and wood products); the inland mills remain.
1989 (Surrey)	No apparent change in the use of the subject parcels; Lindal is using the east end of parcel C for product storage; the campground and RV park has been completed and is occupied; the inland mills remain.
1994 (FFC 94:164)	Little significant change; the sand piles can be seen in the central area of parcel C; Lindal has graded and paved a portion of parcel C just north east of their storage building

Review of air photography records indicates that the property has been in use by lumber milling operators for at least thirty years. Although the property north of the Lindal operation is now a vacant area, it was, until the early 1980's, the site of an active mill. However, the photographs seem to indicate that for the most part, the subject parcels were used for the storage of milled products and supplies. *Therefore, there is no reason to suspect significant soil contamination in these areas.*

1.1.2 BC Research (1991)

BCR conducted a chemical assessment of the soils in the parcels on behalf of the Fraser River Harbour Commission in 1991 (Project # 2-31-305). One hole was drilled on each parcel to a maximum depth of 0.75 metres. Twelve samples were analyzed. Metals, PAH and phenols were below industrial levels except for one subsample in parcel A in which the phenol value exceeded Level C. As a consequence eight additional samples were taken from this parcel at depths to 0.25 metres. As all test results were below industrial levels, BCR concluded that the original high value was a very localized situation, or possibly a laboratory procedural error.

In all they found no evidence of soil contamination above industrial levels.

1.1.3 Klohn-Crippen - Preliminary Geotechnical and Environmental Assessments Report.

The subject report was commissioned by Lindal Cedar and address the vacant section of parcel C and parcels 7&8. The company investigated land titles, reviewed air photos from 1938 to 1989, discussed matters with BCE officials, inspected the site and carried out limited soil and groundwater sampling (also bioassay on groundwater). Specific environmental observations found in the subject report were:

- site inspection found some construction/demolition debris (noted by this auditor in later section);
- test hole driller frequently encountered hog fuel, wood waste and related wood debris;
- groundwater samples were found to have no lethal effects on juvenile rainbow trout at 100% dilution;
- no BETX or metals were detected in groundwater samples in excess of CMCS criteria for discharge water; and
- site investigation involving sampling and testing found no "extensive" presence of contamination.

The consultant included a recommendation for further investigation to delineate one area where oil and grease values exceeded provincial remediation criteria. However, this type of recommendation is common. The potential affected, area is very localized and is not likely to be a costly remediation. Consequently, this issue could be left until the property is developed. Further testing could be included along with other engineering work as part of the process of securing building permits from the District of Surrey. To keep costs down, soil remediation, if needed, could be done during construction when the necessary equipment would be on the site.

1.1.4 Conversations Individuals Having Knowledge of Past Operations

The auditor spoke with Russ Cameron and Bill Godfrey (see contact list in section 1), both have been working in the area for many years. The Brownsville mill complex included a variety of milling operations. According to Mr. Godfrey the only red cedar was milled until 1978. At that time softwood milling was undertaken in the parcels 7&8 only for two years (1979-1980) at which time the mill went bankrupt. The mill used a *pentachlorophenol (PCP) dip tank* to protect milled wood from fungal attack while in outdoor storage or during

shipment. The tank consisted of a 16x24 foot box containing PCP with wood braces across the top. Stacked wood was placed on the supports and hand sprayed with PCP hoses connected to a pump which took PCP from the tank.

The Pentachlorophenol (PCP) dip-tank was located outside the boundaries of parcel 7 near the tracks and Old Mill Road. The surface below the tank was asphaltic concrete and treated products were generally stored at various locations south of the tracks, well away from the subject property. *Consequently, there is no reason to suspect PCP contamination of soil on the parcels 7&8.*

1.2 Conditions at the Time of Inspection

The general layout of the subject property is shown in Figure 1.2. A large part of the property is presently occupied by Lindal Cedar Homes which operates a cedar mill and cedar home fabrication facility on parcels A, B and about 50% of parcel C. The remaining property is vacant.

1.2.1 Drainage

The parcels do not have municipal storm sewer services. On the Lindal parcels storm water drainage is across asphalt surfaces. All of the parcels are located on the river side of the dyke. Consequently, all storm water collects in pools on finished surfaces (and evaporates), flows to the perimeter of the yard asphalt onto adjacent ground, or percolates directly into the exposed soil matrix. As far as it could be determined none of the overland drainage from the subject properties flows directly onto the Fraser River (there are no surface ditches associated with this property).

No significant problems were noted.

1.2.2 Buildings, Structures, Materials and Equipment

The inspection of the Lindal Cedar parcels began at the northeast corner of the operation. This location is at the point where the Brownsville CN spur begins (no longer in use) and the operating rail line veers off to the south. The large Lindal storage warehouse, which occupies much of the northeast section of parcel C (it extends well beyond the parcel boundary toward the river), supplies dry storage for house kits and cover for the planer mill. Much of the steel roofed, wood framed warehouse is not enclosed. All floor surfaces and yard within the parcels is covered with asphaltic concrete. Wrapped house kits are stored in the yard between the spur and southeast property line.

In parcel B is a natural gas fired drying kiln. This long brick building is used to dry green lumber prior to planing and packaging.

This is a saw mill operates in the central yard with a green chain and hogfuel bunker. As far as it could be determined only the hogfuel bunker is located on the subject property (parcel A).

The company stores oil and fuel in a wood building located in the southeast section of parcel A (see 2.1 and 2.2). The floor of the building is constructed of wood timbers.

Land use history for these parcels suggests that there may be some insignificant localized pockets of hydrocarbon contamination. There is no evidence to suggest significant contamination soil from metals, PCB or PCP.

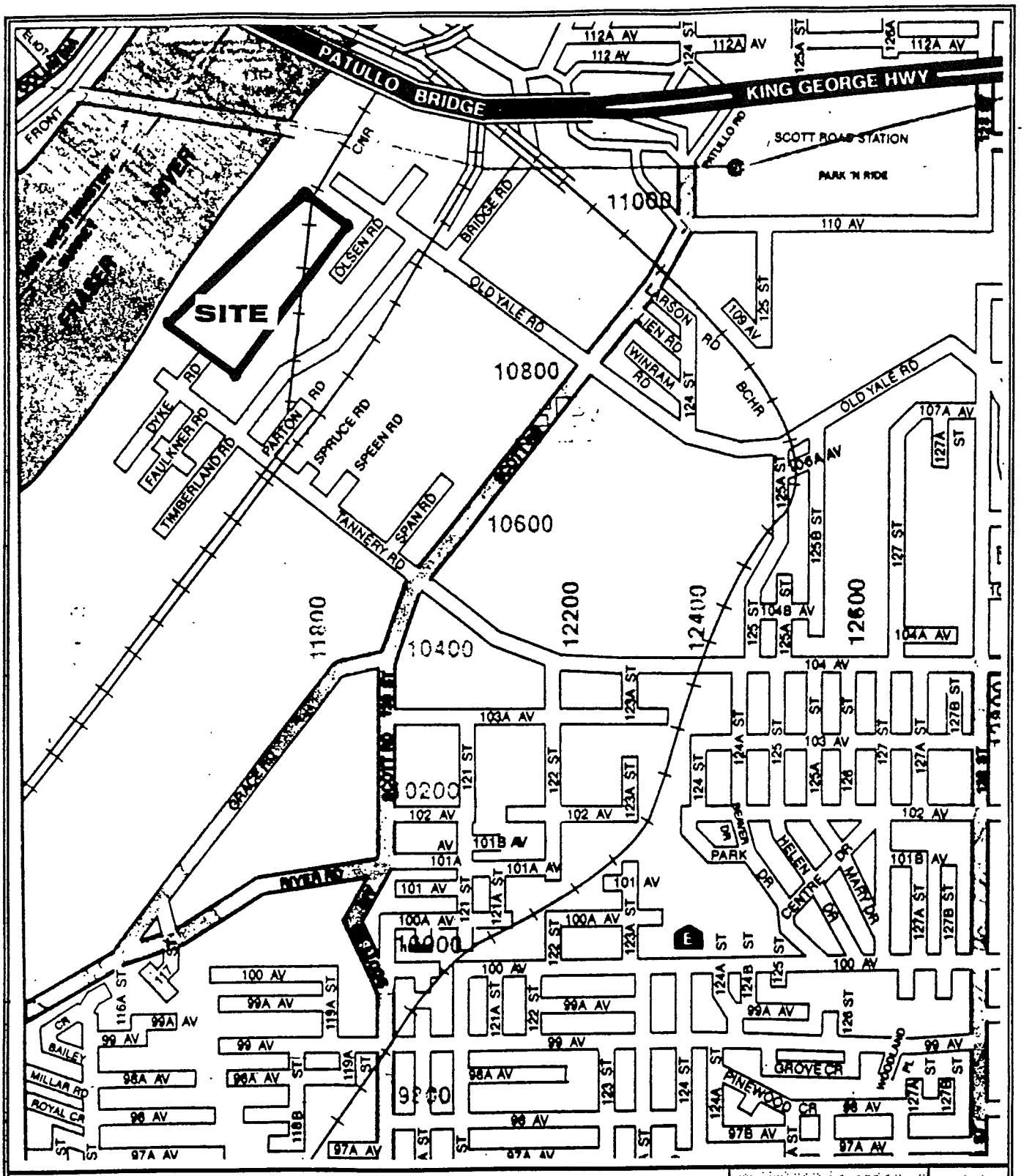
1.3 Surrounding Land Use

The properties are within an area of Surrey zoned for Light Impact Industrial use. The subject property is located in the Westminster area of Surrey, which aside from the occasional residential dwelling, is largely devoted to industrial properties, many of which are related to scrap metal recycling. Rail lines runs through the general area immediately northeast of the subject parcels. A large privately owned camp ground with RV accommodations and a pub is located at the junction of Old Yale Road and the CN tracks.

There is no evidence of significant risk of soil contamination due to surrounding third party operations, most of which are inland of the dyke.

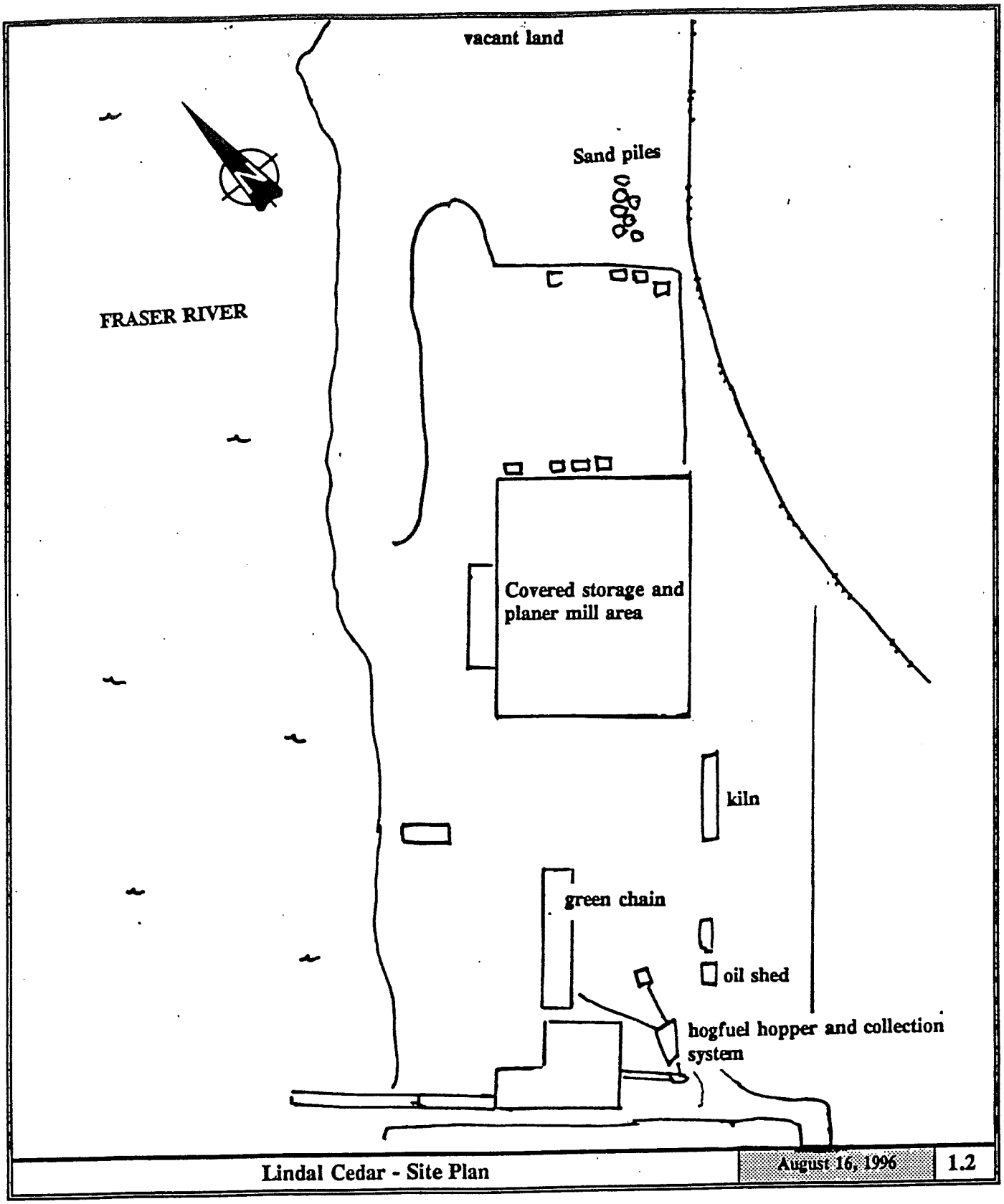
1.4 Environmental Sensitivity

The auditor (a biologist) did not find any evidence of unique terrestrial habitats on, or near the subject properties. The Fraser River Estuary Management Program (FREMP) has completed mapping of the waterfront in respect to fish habitat value. *The waterfront opposite the subject properties have been found to have medium to low productivity fish habitat potential and, consequently, some development of this frontage should be permissible (subject on the easterly side to satisfactory habitat mitigation or compensation).*



Brownsville - Location Map	August 16, 1996	1.1

ENVIRONMENTAL SERVICES - Ron Neumeyer
Pacific Region - Public Works and Government Services Canada - ☎ (604) 623-6386 Fax: (604) 623-6239



Lindal Cedar - Site Plan | August 16, 1996 | 1.2

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Pacific Region - PWGSC - ☎ (604) 623-6386 Fax: (604) 623-6239

2.0 FINDINGS, OBSERVATIONS & RECOMMENDATIONS

This audit was limited to the identification of significant environmental liabilities that could be transferred to the Crown upon acceptance of title for the specified parcels. Therefore, some items normally examined in an operational, or Phase 1 audit were excluded from consideration. Items that fell into this area were PCB electrical devices, equipment with more than 100 litres of petroleum products, asbestos containing materials, radioactive materials, pesticides and tenant environmental policies.

2.1 Soil

Soil contamination is occasionally encountered at commercial or industrial sites and can originate from present, as well as past business practices. Many contaminants are persistent and can migrate through soil and onto groundwater aquifers that supply base flows for fish bearing water. Although contamination can only be verified by using standard testing and analytical methods, an auditor can often detect a potential problem by observation during the site inspection.

- **Findings**

Sand piles - Piles of sand fill, with some metal debris were found in the central section of parcel C, just north of the beginning of the old Brownsville Spur. The source of these piles could not be determined, but may have resulted from excavations during the decommissioning of the wood mill originally located here, or opportunistic disposal by local contractors. *No environmentally hazardous debris was found in the surface of these piles.*

Oil stained soil near Brownsville Spur - South west of the sand piles was a small patch of open ground with some dark oil stains (an oily odour). A small machine may have been serviced here, or some waste oil discarded after servicing in other locations. It is likely that the soil for a short distance below this spot may be contaminated with hydrocarbon residues. Because this is a relatively small, localized spot several hundred metres from the river there is no immediate threat to environmental resources or human health. Bioremdiation (possibly accelerated by the addition of high nitrogen liquid fertilizer) should remove most of the residue over the next few years. *If company staff is responsible, they should be advised to discontinue waste oil disposal in this area. Such oil and lubricant should be collected in a proper container and recycled.*

Oil shed soil - Oil staining was noted along the south side of the oil shed below the drums stored along the outside wall. In addition stained soil was evident below the elevated floor *(see the following section for further discussion on this matter)*.

2.2 Hazardous Materials & Wastes

Hazardous materials, or "controlled products," can represent some level of risk, especially if the volumes are large (i.e., more than 20 kilograms or 20 litres), the material is especially hazardous, or handling is not up to accepted standards. Hazardous wastes are surplus materials or debris that, due to their nature, threatens human health or the environment, and therefore require special handling and disposal techniques to eliminate or reduce this threat. It is often difficult to ascertain the precise chemical make up of hazardous waste. Consequently, analytical work may be needed before a disposal option can be selected.

- Finding - The company stores oil and diesel fuel in a wood building located in the southeast section of parcel A. The floor of the building is constructed of wood timbers. Supplier drums of fuel and lubricant were also stored along the south exterior wall of this building. Inside are five steel 205 litre drums arranged horizontally on wooden cradles. There is a galvanized steel drip tray below the dispensing spigots. These drums contain lubricants and fuel for yard machinery, green chain and planer mill. The floor timbers were found to be very oily, suggesting that minor spills occur during product transfers or drum replacement (the building has been in use for at least 8 years and the discolouration likely reflects long term accumulations). It is evident that some oil and fuel residues are present in the soils below, and alongside this building. However, movement of such residues onto neighboring properties, or into any underlying groundwater aquifer, is not likely to be significant as the building prevents direct entry of precipitation, and the site is level in this area, limiting storm water flow below the building (which backs onto the river side of the old dyke).

Recommendation - It would prudent to replace the old oil storage building with a modern one, designed for such storage, and remediate the underlying soils. If this is not done, the contamination problem will likely continue and the level of soil contamination will remain, or possibly become more serious.

2.3 Storage Tanks

Steel or fibreglass tanks are often used to store hazardous liquids such as petroleum products or waste oil. The term "tank" in the context of an audit includes pipes, lines, fixtures and other related equipment. Tanks may be designated as "underground" (UST) or "aboveground" (AST). Tank storage constitutes an environmental risk because of the potential for uncontrolled or undetected release of hazardous liquids into soil, surface water or groundwater.

- Findings

Belowground storage tanks

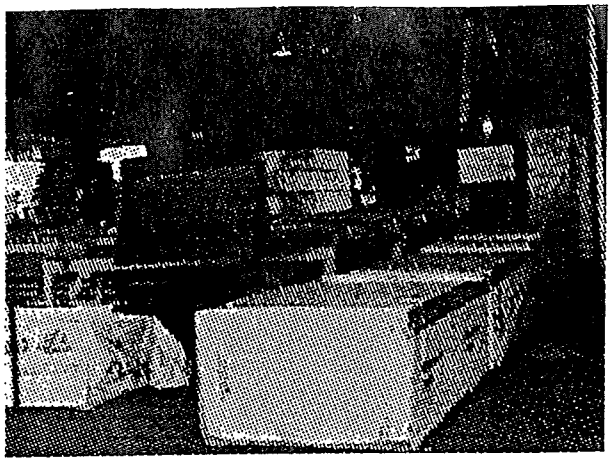
The local water table is often at, or near the surface. As a consequence the installation of underground tanks is not practical, and there is not evidence that such installations have been attempted on the subject

Aboveground storage tanks

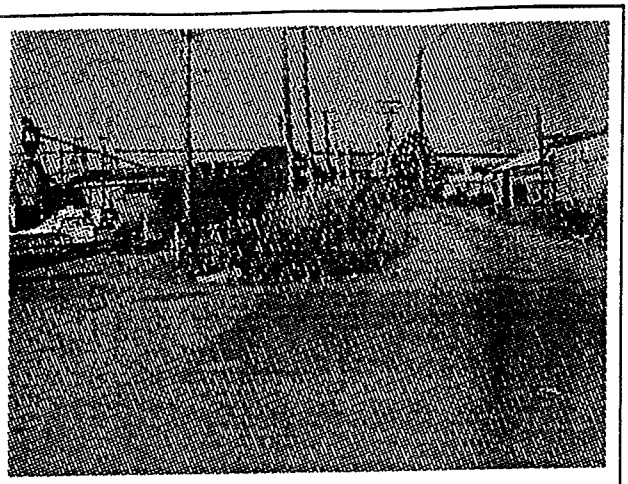
No active aboveground storage tanks were found on the subject land parcels. Lindal has always used natural gas to provide heat for the kiln. The Mill Superintendent informed the auditor that Lindal has not installed fuel oil tanks for the kiln, and that he has no knowledge that such tanks were used by the Brownsville mill when that company operated the kiln. Aerial photography indicates that the kiln has been here since at least 1970 (at one time part of the Brownsville Mill operation). Prior to natural gas the kiln relied on a steam generator (a wood fired boiler). As far as could be determined fuel oil fired heating has never been used to operate the kiln. No record of aboveground tanks use was found during the course of this audit.

View of Lindal Cedar and a portion of parcels 7&8 from the Skytrain bridge looking south.

INSPECTION PHOTOGRAPHS

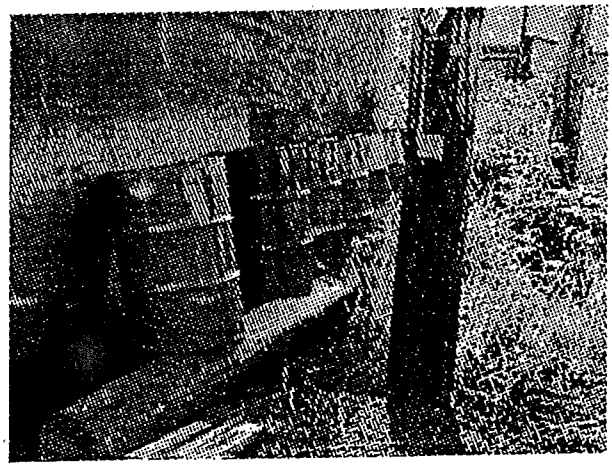


View of planer mill inside shed

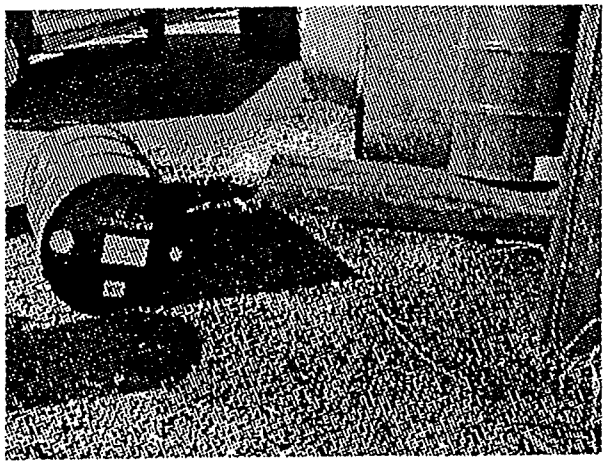


Oil shed and dyke looking northeast at entry road

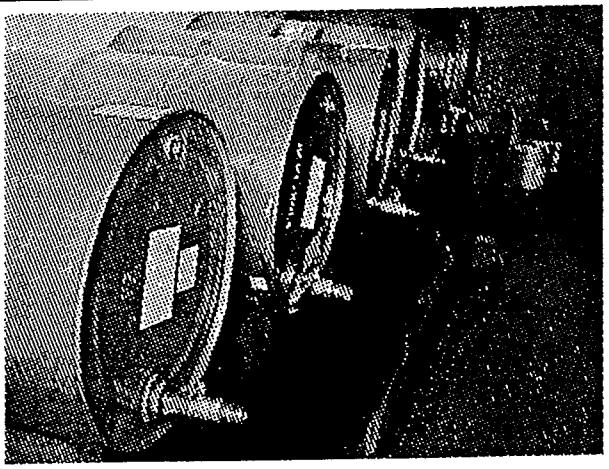
Hogfuel hopper and supply conveyer in southwest sector of parcel A



Oil drums stored along south wall of oil shed.



Oil staining of soil near entry door to oil shed



Inside of oil shed showing bulk dispensing drums and drip tray.

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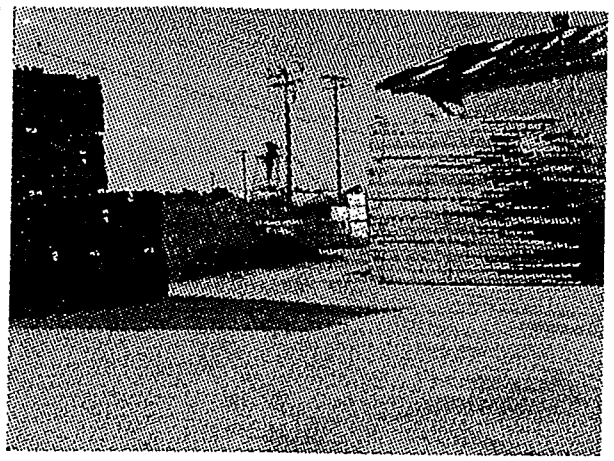
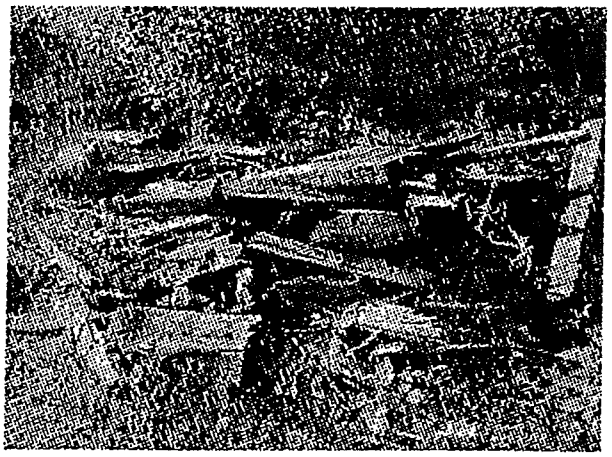
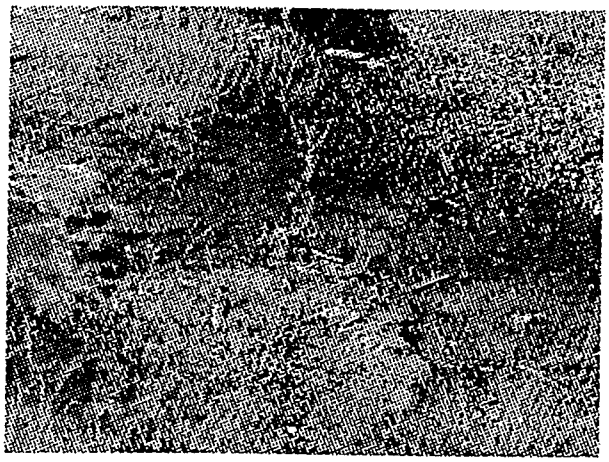
Pacific Region - PWGS Canada - ☎ (604) 623-6386 Fax: (604) 623-6239 - (neumeyer@pwgsc.gc.ca)



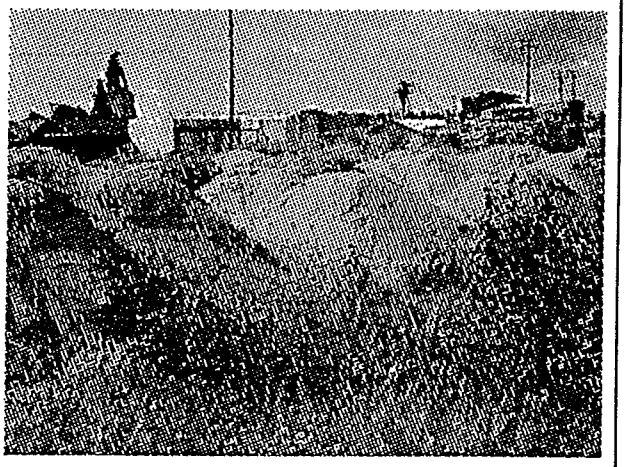
Outdoor wood storage - southeast corner of shed



Pile of fire damaged wood demolition debris north of sand piles in Parcel C.

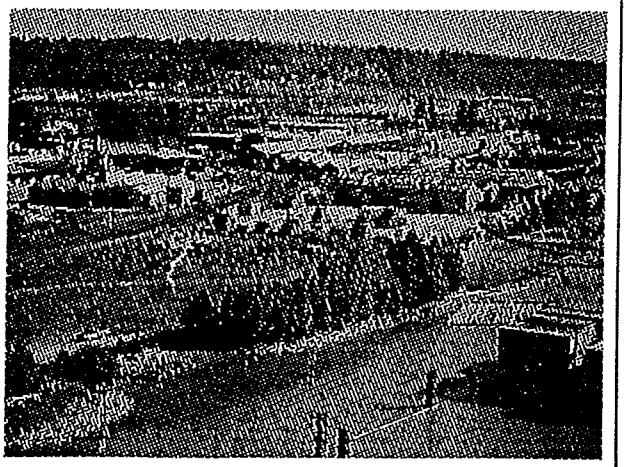


Patch of oily soil between sand piles and paved Lindal storage yard in parcel C.



Piles of sandy fill located in the south central sector of parcel C.

Small piece of asphalt found on top of one of the sand piles.



Aeriel view of property, Lindal operation and vacant parcels in central area.

SECTION 2 - PORT MANN SITE AUDIT REPORT

1.0 PAST STUDIES

The location of the subject parcels of federal property is illustrated in figure 2.1. Details of the environmental information on this site is summarized in this section of the report.

1.1 1991 B.C. Research CN Port Mann Site Assessment Report

On behalf of the Fraser River Harbour Commission the consultant conducted a drilling and testing program involving a total of 29 holes. Their conclusions (level C means "industrial/commercial") are summarized in the following table:

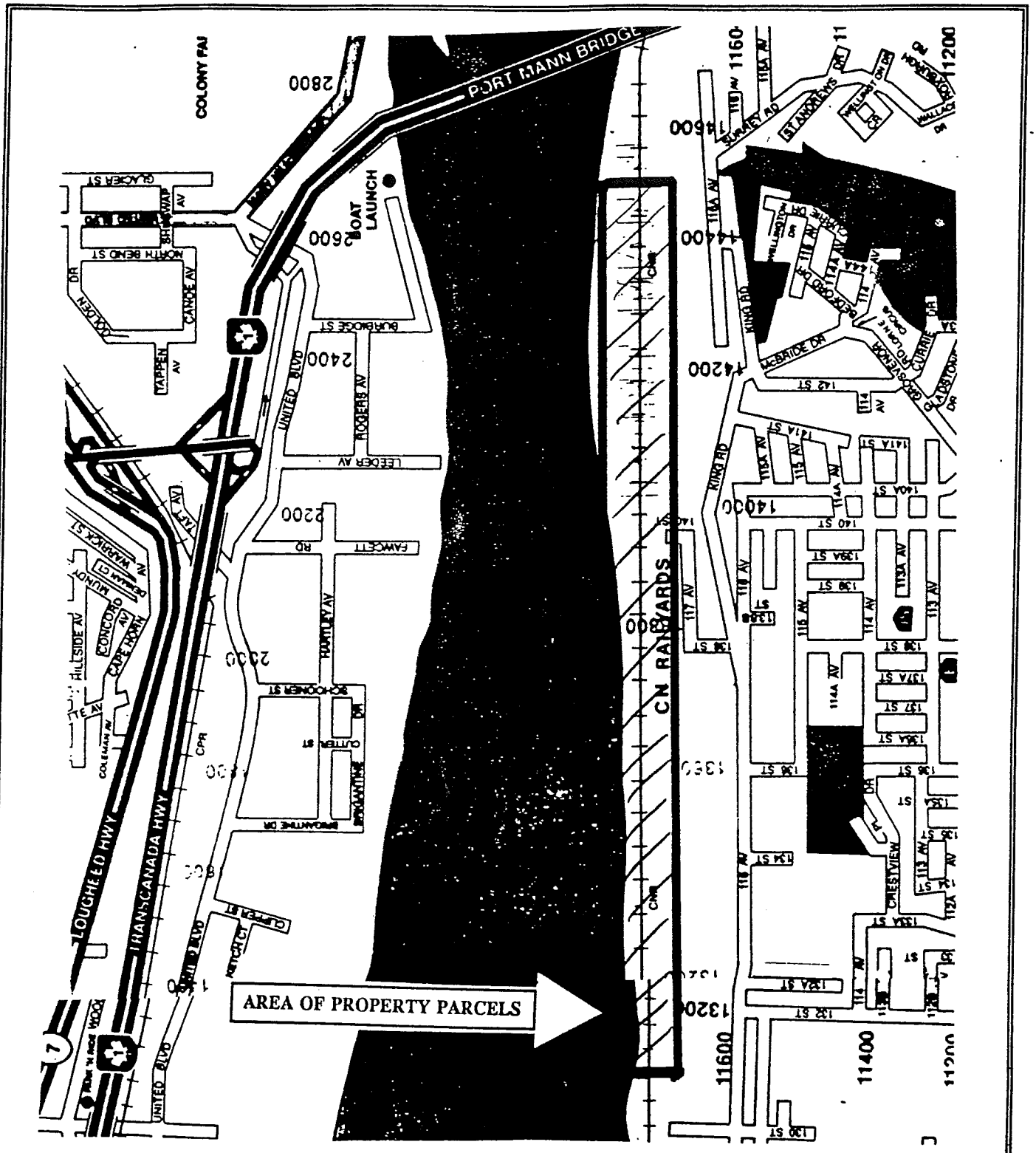
Parcel	Comments
1	above level C oil and grease
2	all parameter values below C
3	above C oil & grease, and metals
4	above C copper and oil & grease
5	above C silver
6	all parameter values below C

The consultant points out that some soil contamination is to be expected given the past use of portions of the property for rail lines and, in respect to parcel 6, a sawmill (although presently this is limited to log storage). Parcel 1 is leased from CN by International Forest Products which has used a variety of antisapstain chemicals over the years. Although the lease is now paved, the consultant expressed the concern that some of these chemicals may have migrated from treated wood into underlying soil before the pavement was installed.

1.2 1992 Property Transfer Assessment Checklist

The subject property was screened by Realty Division of PWGSC in 1992 (Project No. 762429). Results of this screening are quoted in this section.

> "Six parcels of land in the Fraser River Harbour being portions of the bed and foreshore of the Fraser River fronting portions of Parcel "A" of Fractional Section, 1, 2, 3, Block 5, North, Range 2 West, NWD having a total area of 2.1206 ha. Specific details as noted during the 1992 inspection were as follows:



Location Map - Port Mann Property	August 16, 1996	2.1

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Parcel 1 - consisting of 0.2830 ha. which is paved and used by International Forest Products for the outside storage of lumber prior to shipment.

Parcel 2 - consisting of 0.962 ha. which contains fill and small amounts of gyproc but there is no observable activity.

Parcel 3 - consisting of 0.3153 ha. contains fill, various debris and is used as a roadway.

Parcel 4 - consisting of 0.0463 ha. is occupied by a marina and there is domestic and boat related debris on site.

Parcel 5 - consisting of 0.9867 ha. includes a treed area, the crossing of the TransMountain Pipeline, roadways, rail spurs to the Fletcher Challenge chip loader and part of the area near the chip loader. Various debris related to either the chip loading operation or the railway were found on this parcel.

Parcel 6 - consisting of 0.3931 ha. contains general fill and forms a roadway between the chip loader to the intake for the former B.C. Hydro Port Mann thermal generating station. There is minimal debris on this parcel.

2.0 PRESENT DAY AND PROJECTED USE OF THE PROPERTY

The majority of the developed property is being used on a daily basis by CN for rolling stock, and the temporary parking and shuttling of rail cars. It appears that only a small portion of the lower section of the CN yard actually occupies the subject parcels. Rolling stock is cleaned on lines which cross the subject parcels, nor are waste materials from rail cars deposited on these parcels. Dust control on the private CN access road and rail line does not involve the use of oil, or other liquids that could result in soil contamination.

International Forest Products leases parcel 1 from CN. The company presently uses NP1 antisapstain for wood destined for Japan. Some of these products may be stored on the paved lease from time to time. However, the company is monitoring stormwater runoff in accordance with the BC *Antisapstain Chemical Regulation* and has found the NP1 values to be consistently below the allowed limits.

The remaining sections of the parcels are either undeveloped riparian land or devoted to environmentally benign uses such as small moorages, and marinas, and chip loading facility (for the former BC Hydro thermal generating plant located just west of the property).

2.1 Environmental Issues

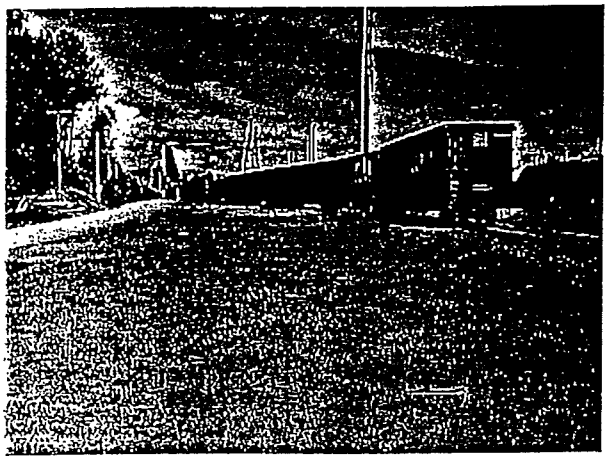
There is a potential for significant, but localized, soil contamination in some of the parcels. Parcels 1, 3 and 4 may have zones in which soil oil and grease, and possibly some metals, are at levels where remediation may

be needed if further development takes place. In addition, some PCP residuals may be present in the soils below the paved wood storage compound in parcel 1. The levels of contamination in Parcels 1, 2 and 6 do not appear to be significant from the perspective of commercial/industrial use.

Environmental issues identified thus far do not impede the continued use of these parcels for present commercial purposes. Operations presently carried out on these parcels are not likely to have significant adverse effects on environmental resources in the surrounding area.

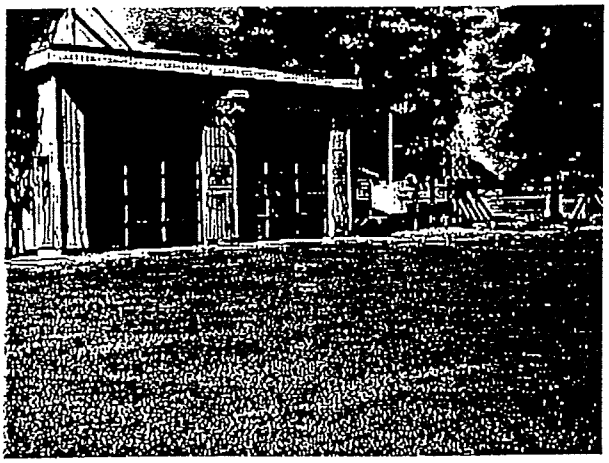
Log storage in parcel 1.

View to the east looking along parcel 2.

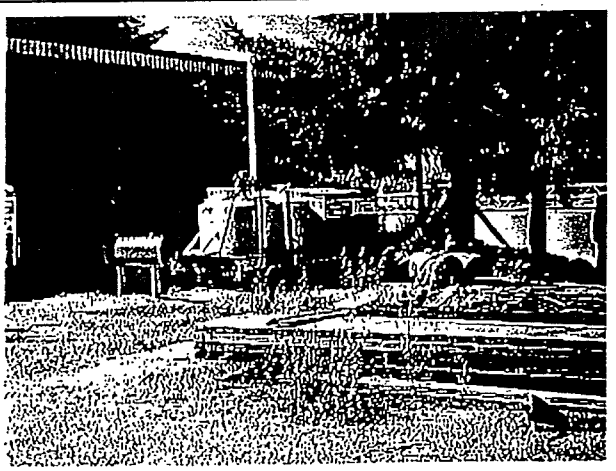


View to the east showing CN rail line located in parcel 3

Chip loading facility in parcel 5.



Fletcher Challenge storage garage in parcel 5, near chip loading ram.



Contained waste oil AST on east side of Fletcher storage garage, parcel 5.

FORMER LINDAL SAWMILL

(Company #539019BC Ltd.- Small Wood)

SEMI ANNUAL

ENVIRONMENTAL REVIEW

FIRST HALF OF 1999

Date: June 1999

Prepared for: Ms. Shelley O'Callaghan

Bull, Housser and Tupper

3000 Royal Centre

P.O. Box 11130

Vancouver, B.C.

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Prepared by: Mr. Tony DiNino, M.Eng., P.Eng.

Senior Review: Mr. Thomas W. Finnbogason, B.Sc.

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Attachment 1 1999 First Action Item Report

FORMER LINDAL SAWMILL

(Company #539019BC Ltd.- Small Wood)

Semi Annual Environmental Review - First Half of 1999

1.0 SCOPE

This Semi-Annual Environmental Review, for the first half of 1999, provides an environmental assessment of the Former Lindal Sawmill (Company #539019BC Ltd - Small Wood) which is currently not operating. This detailed inspection was conducted by Mr. Tony Di Nino, P.Eng. on June 22, 1999.

Environmental risks and management practices were evaluated with respect to compliance with current regulations, and standard industrial practices.

The review focusses on the current non-operational condition of the mill, however, where observed, potential future issues have also been included which may arise upon mill start-up.

2.0 ENVIRONMENTAL REVIEW OVERALL ASSESSMENT

The 1999 First Half score for the Former Lindal Sawmill was **3.3.** The scores for the protocol areas inspected are shown in the **Environmental Report Card** on page 5. Protocol areas without a score assigned will be ranked when the mill is operating. A description of Envirochem's numerical ranking system is provided in **Section 4.0.**

The operational and management practices, with respect to environmental issues, were not assessed and will be evaluated when the mill is operational.

3.0 FIELD OBSERVATIONS AND ACTION ITEM REVIEW

There were **three** high priority (score of 1 to 2.5) issues and **three** moderate priority (score of 3 to 3.5) issues identified during this review. These action items are listed below along with their corresponding action item number - (**YY[year]** · **S[section]** · **S[sub-section]** ·**#[assigned number]**).

The high priority issues include:

- **99.3.1.1** Ensure all PCB capacitors are registered and appropriately stored or disposed according to the B.C. Special Waste Regulation and the Federal PCB Waste Material Storage Regulation.

- **99.3.4.1** Investigate if Mill and Timber may become liable for any potential contamination related to the past practices at the site. Also consider having a Stage 1 and/or Stage 2 site investigation undertaken, if one has not already been conducted.

- **99.3.4.2** Assess the extent of hydrocarbon contamination associated with obvious staining on site and appropriately remediate and dispose of hydrocarbon contaminated soils.

  This action item applies to liable parties and should be completed prior to mill startup to ensure Mill and Timber does not become liable for any contamination unrelated to their operation of the mill.

The moderate priority issues include:

- **99.1.1.1** Investigate if Mill and Timber may become liable for any potential contamination related to the current and past use of the diesel tank.

  The tank is currently situated on the Former Lindal Sawmill

property, but is being used by the adjacent business Lindal Cedar Homes. Requesting that Lindal Cedar Homes move the tank to their area of operation (off the Former Lindal Sawmill property) may mitigate present and future liability related to potential fuel spills. Regardless of where the fuelling practices occur, consideration should be given to improve fuel management (see Action Item 99.1.1.2).

- **99.1.1.2** Consider upgrading the diesel tank to a double-walled vacuum monitored tank equipped with a top mounted pump, hose retriever, and drip catcher. The dispensing/delivery area should also contain a concrete fuel pad and oil/water separator to treat stormwater from the fuel pad. Alternatively, a Mini-Tanker service could be used to remove the liability of having a fuel tank on site.

- **99.1.2.1** Ensure all drums at the site are stored with adequate containment and/or consider returning full drums of oil to the supplier (Fuchs)

All action items and their corresponding review details, are provided in the 1999 First Half Action Item Report in **Attachment I.**

4.0 ENVIRONMENTAL NUMERICAL RANKING SYSTEM

The Envirochem numerical system is used to assign a priority ranking to each section and activity reviewed. The numbers range from 1 to 5 with 1 indicating the highest risk of environmental impact and 5 indicating little risk of impact. The score for each activity is based on the action item of highest risk as there is often more then one action item tied to each activity. Action items and scores are reported according to the following table which provides detailed descriptions of each of the five priority rankings.

RANK	DEFINITION	CHARACTERISTICS
1	• Non-Compliance • Highest risk	• Ongoing or recent chemical, petroleum, oil, or lubricant (POL) release with potential for significant impact • Current non-compliance and/or high likelihood of regulatory enforcement actions • Urgent and immediate remedial action is required • Demonstrated lack of diligence
2	• Non-Compliance • High risk	• Potential risk of release of chemicals or POL that could result in significant impact • Inadequate containment with a potential for release of significant volume • Non-compliance with possible regulatory action or significant impacts • Remedial action is required • No proper handling or operating procedures

		• Significant inadequacy in emergency preparedness
3	• *Possible Non-Compliance* • *Moderate risk*	• *Release of chemical to the environment is possible under certain circumstances* • *Containment is in place but improvement or repair is necessary* • *Non-compliance but unlikely to result in regulatory action* • *Existence of air/liquid/solid waste discharges to the environment that require permitting or regulatory clarification* • *Improvements to handling, operational, or emergency procedures are necessary*
4	• Low Risk	• Containment is adequate • Improvement to operational procedures is necessary to prevent chemical loss • Remedial action includes staff training
5	• Lowest Risk	• No deficiency or concern is observed, at this time • This score may be used in cases of minor deficiencies in signs and labelling • Indicates good management practices

Although the use of a numerical scoring system does provide several important advantages, it is subjective and scores may change depending on the auditor's experience, the current state of industrial practice, and the regulatory framework. Consequently, changes in any one of these factors (e.g., a change in regulations) could result in a change of score even though the activity or operational practice has not changed.

5.0 FOLLOW-UP BY MILL AND TIMBER PRODUCTS LTD.

To ensure action items are completed, Mill and Timber should review the Action Items provided in **Attachment 1** and assign responsibilities and completion dates for the incomplete Action Items. The responsibility of many of the action items may reside with the property owner or past user(s) of the site.

ENVIRONMENTAL REPORT CARD

for

PROTOCOL AREAS REVIEWED IN FIRST HALF OF 1999

FORMER LINDAL SAWMILL

(Company #539019BC Ltd.- Small Wood)

		1999 (First Half)
Section 1 - Bulk Oil and Fuel Management		
1.1	*Vehicle Fuelling Station*	*3.0*
1.2	*Drum Storage Areas*	*3.0*
Section 2 - Process Lubricants		
2.1	Sawmill Hydraulic Units	-
Section 3 - Regulatory Aspects		
3.1	*PCB Equipment*	*1.0*
3.2	Air Emissions	-
3.3	Other Regulated Substances (asbestos)	5.0
3.4	Site Contamination from Previous Activities	2.0
3.5	Spill Contingency Planning	-

Section 4 - General Housekeeping		
4.1	Inside Buildings	5.0
4.2	Yard Cleanup	4.0
	AVERAGE SCORE	3.3

SUMMARY OF RANKINGS:

1 - Most Urgent

2 - High Risk

3 - Moderate Risk

4 - Low Risk

5 - Lowest Risk

ATTACHMENT 1

1999 First Half Action Item Report

Lindal Sawmill
1999 First Half Action Item Report

21-Jun-99

Review Detail	Action Item #	Audit Reference	Action Item	Priority	Responsibility	Date Required	Status	Complete
BULK OIL AND FUEL MANAGEMENT								
The former boomboat single walled AST has been moved from the shore to an area beside the oil drum shed located on the west side of the property. The tank now services a diesel transport truck used by the adjacent business Lindal Cedar Homes.	99.1.1.1	Diesel Fuel Tank	Investigate if Mill and Timber is liable for any potential contamination related to the current and past use of the diesel tank	3.00				No
The tank is equipped with a containment tray and fuel is dispensed through a gravity feed system. Deficiencies related to the tank include: 1) the use of a gravity feed fuel dispensing system which is discouraged by BC MELP and is no longer an industry standard; 2) the containment tray would likely not capture a spill of fuel if the tank was punctured; 3) no vehicle impact protection; 4) no fuel/delivery pad; 5) no spill equipment was present; 6) no posted spill, fire, fuel dispensing and delivery procedures; 7) there are signs of corrosion on the outer shell of the tank.	99.1.1.2	Diesel Fuel Tank	Consider upgrading the tank to a double-walled vacuum monitored tank equipped with a top mounted pump, hose retriever, and drip catcher. The dispensing/delivery area should also contain a concrete fuel pad and an oil/water separator to treat stormwater from the pad. Alternatively, a mini-tanker service could be used to remove the liability of having a fuel tank on site.	3.00				No
	99.1.1.3	Diesel Fuel Tank	Provide vehicle impact protection at the diesel tank	3.00				No

Lindal Sawmill
1999 First Half Action Item Report

21-Jun-99

Review Detail	Action Item #	Audit Reference	Action Item	Priority	Responsibility	Date Required	Status	Complete
	99.1.1.4	Diesel Fuel Tank	Develop and post spill and fire response procedures	3.00				No
	99.1.1.5	Diesel Fuel Tank	Develop and post fuel dispensing procedures	3.00				No
	99.1.1.6	Diesel Fuel Tank	Develop and post delivery procedures	3.00				No
The containment tray of the tank was half full of oily water	99.1.1.7	Diesel Fuel Tank	Appropriately dispose of the oily water from the diesel tank containment tray	3.00				No
The oil drum shed is located on the west side of the property adjacent to the diesel fuel tank. Personnel at Lindal Cedar Homes indicated that the shed is not being used. 9 drums of oil were stored horizontally on a steel cradle inside the shed. Each drum was equipped with a manual valve and drips were collected by a common drip tray. Deficiencies identified at the oil shed include: 1) no containment provided by the shed for the drums; 2) full drums of oil were stored outside the shed with no containment; 3) the shed was unlocked.	99.1.2.1	Drum Storage Areas	Provide adequate containment for the drums at the oil storage shed	3.00				No
	99.1.2.2	Drum Storage Areas	Lock the shed when not in use	3.00				No

Review Detail	Action Item #	Audit Reference	Action Item	Priority	Responsibility	Date Required	Status	Complete
There was visible oil staining on the ground in front of the oil shed.		Drum Storage Areas	See action item 99.3.4.2	3.00				No
There were full drums of oil stored without containment in various areas inside and outside the mill. This included: 1) drums of Chain Oil stored outside the oil shed; 2) two drums labelled "Centraulic AF46 - For Boomboat Only" stored on their side near the shore; 3) a drum of Renolin AF46 equipped with a handpump and stored on the west side of the green chain; 4) a drum of AF46 stored on the log deck; 5) two drums of AF46 stored on the first floor of the mill.	99.1.2.3	Drum Storage Areas	Ensure all drums are stored with adequate containment and/or consider returning full drums of oil to the supplier (Fuchs).	3.00			On-going	No
PROCESS LUBRICANTS								
None of the hydraulic units at the mill were equipped with spill trays. All hydraulic units, especially those located near the Fraser River, should be equipped with spill trays before plant startup.	99.2.1.1	Hydraulic Units	Install spill trays on all hydraulic units before mill startup.	-				No
	99.2.1.2	Hydraulic Units	Consider using a low toxicity oil for those hydraulic units located near the Fraser River.	-				No

Lindal Sawmill
1999 First Half Action Item Report

21-Jun-99

Review Detail	Action Item #	Audit Reference	Action Item	Priority	Responsibility	Date Required	Status	Complete
REGULATORY ASPECTS								
Four capacitors were identified on the first floor of the mill. One was labelled "WEMCOL 1 Non PCB Flammable Fluid" and the other three were labelled "Inerteen" which is PCB dielectric.	99.3.1.1	PCB Equipment	Ensure all PCB capacitors are registered and appropriately stored or disposed according to the B.C. Special Waste Regulation and Federal Storage of PCB Material Regulation.	1.00				No
The transformer could not be investigated for PCBs as access to the unit was restricted.	99.3.1.2	PCB Equipment	Investigate if transformer contains PCBs	3.00				No
According to Ernie Wah, there is no GVRD air permit associated with the site. The site will likely require an air permit once it is operational.	99.3.2.1	Air Emissions	Investigate the requirement for a GVRD air permit before start up of the mill.	-				No
Although an asbestos survey was not specifically conducted, there appeared to be no abestos materials on-site.	99.3.3.1	Other Regulated Substances		5.00				No

Lindal Sawmill
1999 First Half Action Item Report

21-Jun-99

Review Detail	Action Item #	Audit Reference	Action Item	Priority	Responsibility	Date Required	Status	Complete
According to Lindal Cedar Homes personnel, the Lindal Sawmill site was previously a shingle plant before the sawmill operation. There may be subsurface contamination issues related to past practices at the site which should be identified before the site is used by Mill and Timber. There were no stage 1 or stage 2 site investigation reports avaliable for Envirochem to review.	99.3.4.1	Contamination from Previous Site Activities	Investigate if Mill and Timber may be liable for any potential contamination related to the past practices at the site. Also consider conducting a stage 1 and/or stage 2 site investigation, if one has not already been conducted.	2.00				No
The ground near the former boomboat fuel area and the oil shed shows signs of surface hydrocarbon staining.	99.3.4.2	Contamination from Previous Site Activities	Assess the extent of hydrocarbon contamination and remediate and dispose of contaminated soils.	2.00				No
An important aspect to reducing environmental risk is the implementation of a spill response plan and spill response training, both of which will be required once the mill is operational.	99.3.5.1	Spill Contigency Planning	When the mill is operational, develop a spill contingency plan and provide personnel with spill response training.	-				No
GENERAL HOUSEKEEPING								
Four drums of chopped metal strapping and other scrap metal were stored near the oil drum shed.	99.4.1.1	Yard Clean-up	Recycle strapping and scrap metal	4.00				No
Wood debris was present in the area of the log lift.	99.4.1.2	Yard Clean-up	Remove and appropriately dispose of wood debris	4.00				No

Phase I Environmental Site Assessment
Fraser River Port Authority
Brownsville Site, Surrey, BC

Prepared for:
FRASER RIVER PORT AUTHORITY

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405-003.02
September 2006

EXECUTIVE SUMMARY

Hemmera was retained by the Fraser River Port Authority (FRPA) to complete a Phase I Environmental Site Assessment (ESA) for the Brownsville Site in Surrey, BC. This Phase I ESA program was conducted in support of a proposed property transfer from the Canadian National Railway (CNR) Company to the Government of Canada, to be administered by the FRPA.

The Brownsville Site ("the Site") is a 1.43-hecatre property owned by CNR that is currently zoned IL-1 (light impact industrial zone). The subject property is comprised of six (6) parcels (from southwest to northeast: Parcel A, B, C, Rem-C, 9 and 7) that are situated between the Fraser River and the CNR line southwest of the Patullo Bridge.

Parcel A is occupied by Smallwood Sawmills, which carries out wood chipping activities on Site. Parcels B, C and the southwest portion of Rem-C are occupied by Lindal Cedar Homes, which uses the site for wood storage (i.e., warehousing) and distribution activities. Parcels 7, 8 and the northeast portion of Rem-C are occupied by Lyndowana Lumber Ltd, a private log salvage operation.

The land use on-Site has been light industrial (wood manufacturing and processing) from at least 1932 to present day. Wood manufacturing and processing operations occupied the northeast side of the Site (Parcels 7 and 8) from the early 1930's, and this area of the site has been predominately used for wood storage since the early 1960's. Small house sized buildings were evident in the southwest part of the Site (Parcels A, B and C) from the early 1930's to the early 1950's (likely part of the fishing community). The house-sized buildings were removed by 1952 at which time the Parcels were overgrown with vegetation. By 1963, the vegetation was removed from Parcels A, B and C, and Brown Lee Mills was constructed in this area. Also by 1963, Parcels Rem-C, 7 and 8 were occupied by Brownsville Mills and were primarily used for wood storage. The Brown Lee Mill occupied Parcels A, B and C until the late 1970's when the current Site buildings were built. The Brownsville Mill occupied Parcels Rem-C, 7 and 8 until the early 1980's when multiple buildings were removed, vegetation began to grow, and the area was used for storage purposes. Smallwood Sawmills and Lindal Cedar Homes have occupied the Site from the early 1980's to present day.

The land use surrounding the Site has been predominantly light industrial and commercial since at least 1952, with some residential areas prior to approximately 1980. Before 1952, the surrounding

and up gradient properties were woodland and/or farmland. From 1952 to present day, the surrounding industrial and commercial operations consisted of wood manufacturing and processing, with increasing numbers of automobile and truck service-type commercial operations after approximately 1980.

Based on records review, interviews and Site visit information; it was concluded there are four (4) on-Site APECs and three (3) off-Site APECs that could potentially impact soil and/or groundwater on-Site. The APECs and their COPCs are summarized in **Table ES1** and **Table ES2** below.

Table ES1: Summary On-Site APECs and COPCs

APEC No.	APEC Description	Media	COPCs	Investigation Rationale	Proposed Investigation Locations
1	Oil Storage Shed	Soil and Groundwater	Petroleum Hydrocarbons	• Extensive staining inside and outside of storage shed and unprotected drums stored outside shed, as observed by PWGSC in 1996, by FRPA in July 2000, and by Hemmera during 2006 Site visit. • No secondary containment for drums in use inside shed. • Smallwood Sawmill Ltd reportedly removed outside drums and oil-stained soil in September 2000, but extent of soil removal is unknown and many outside drums and staining are still present.	MW06-1
2	Sawmill operations located on-Site (Parcels A, B, C, Rem-C, 7, and 8) from approximately 1932 to present	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	• Specific sawmill activities/locations are not known.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5
3	Oil stains/odours observed beneath the green chain	Soil and Potentially Groundwater	Petroleum Hydrocarbons	• Petroleum hydrocarbon odours and potential staining were observed beneath the green chain during 2006 Site visit. • The ground surface beneath green chain is concrete of unknown condition.	SS06-1
4	Historic fill materials of unknown origin, within top 2 to 3 m below ground surface (bgs) across the Site	Soil and Potentially Groundwater	Petroleum Hydrocarbons, Metals (particularly Zinc)	• The age and origin of the fill materials is unknown, though the materials were likely placed on the site prior to 1932. • Historic soil samples within the Site fill materials indicated levels of zinc above the CSR standards. • Site fill materials have never been sampled for petroleum hydrocarbons, the primary site COPC.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5

Table ES2: Summary Off-Site APECs and COPCs

APEC No.	APEC Description	Media	COPCs	Investigation Rationale	Proposed Investigation Locations
5	Former pentachlorophenol (PCP) spraying tank reportedly located immediately southeast of Parcel 7 (near railroad tracks). PCP-treated wood was also stored adjacent to the Site for drying.	Soil and Groundwater	Petroleum Hydrocarbons, Chlorophenols	• Identified during 1996 investigation by PWGSC, and discussed in 2000 FRPA report and 2002 Keystone report. • Stacked wood reportedly placed on supports and hand-sprayed with PCP pumped from a tank. Surface below tank was apparently asphalt paved, but the extent and condition of the historic paving is unknown. Treated products were then reportedly stored south of the railroad tracks.	MW06-4
6	Adjacent and up gradient historical industrial activities and Brownsville rail spur adjacent to Parcels A, B and C, Rem-C, 7 and 8.	Soil and Groundwater	Petroleum Hydrocarbons, Metals, Chlorophenols	• Milling operations or related industries have been adjacent to the Site since at least 1932, and the rail spur has been present since 1891. • A metal depot was operated adjacent (northwest of the Site) from 1970 to 1985. • Historical light industrial operations, including auto body repair shops, shingle production, and concrete production were located within 300 m of the Site.	MW06-1, MW06-2, MW06-3, MW06-4, MW06-5
7	RV Park Diesel Spill	Soil and Groundwater	Petroleum Hydrocarbons	• BC Site registry search indicated a diesel spill occurred at 11940 Old Yale Road (RV Park) in 1999. • The site is currently "ACTIVE UNDER ASSESSMENT" according to BC MOE.	MW06-4, MW06-5

Based on the APECs identified during the Phase 1 ESA and outlined above, Hemmera has concluded that additional investigation through a Phase II ESA process is warranted to confirm or refute if soil and/or groundwater contamination is present at the identified APECs. Five (5) monitoring well locations and one (1) surface sample are proposed as part of a Phase 2 ESA program. These proposed investigation locations are illustrated on Figure 2 and described in **Tables ES1** and **ES2** (above) in relation to each APEC.

It is also recommended that prior to the proposed property transfer, FRPA should identify and quantify the on-Site waste materials (e.g. small pieces of abandoned machinery, tires, wood pallets, scrap wood, etc.) in order to assess future disposal costs. These waste materials would not likely result in Site contamination and do not represent an immediate environmental concern, but the assumption of a property with waste materials could represent a liability to FRPA, since the cost and responsibility associated with the appropriate off-site disposal of these materials would also be assumed.

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1.0 INTRODUCTION

Hemmera was retained by the Fraser River Port Authority (FRPA) to complete a Phase I Environmental Site Assessment (ESA) for the Brownsville Site in Surrey, BC (**Figure 1**).

The Brownsville Site ("the Site") is a 1.43-hecatre property owned by the Canadian National Railway (CNR) Company that is currently zoned IL-1 (light impact industrial zone). The subject property is comprised of six (6) parcels (Parcel A, B, C, Rem-C, 7 and 8) (**Figure 2**) that are situated between the Fraser River and the CNR line southwest of the Patullo Bridge.

Parcel A is occupied by Smallwood Sawmills; Parcels B, C and the southwest portion of Rem-C are occupied by Lindal Cedar Homes; and Parcels 7, 8 and the northeast portion of Rem-C are occupied by Lyndowana Lumber Ltd. Industrial wood processing and wood manufacturing mills have operated on-Site from at least 1932 to present.

This Phase I ESA program was conducted in support of a proposed property transfer from CNR to the Government of Canada, to be administered by the FRPA.

2.0 OBJECTIVES AND SCOPE OF WORK

The objective of the Phase I Environmental Site Assessment (ESA) was to identify areas of potential environmental concern (APECs) and constituents of potential concern (COPCs) associated with the current and/or historical operations at the Site. In order to complete the Phase I ESA, the following work was undertaken:

- Searches were performed to obtain information of environmental significance from the municipality, the province and the federal government;
- Interviews were conducted with persons knowledgeable about current and historical activities on and in the vicinity of the Site; and
- A Site visit was conducted to assess the conditions on the Site.

The Phase I ESA was conducted in accordance with the guidelines as set forth in the *Canadian Standards Association (CSA) Standard Z768-01, Phase I Environmental Site Assessment (November 2001)*. The information and reporting also satisfies the requirements of a Preliminary Site Investigation as prescribed in the *BC Environmental Management Act* and *Contaminated Sites Regulation*.

In accordance with the FRPA's requested scope of work, this Phase I ESA does not include an assessment of the potential impacts from the Brownsville Site to the downgradient water lots owned by the Government of Canada and administered by the FRPA.

3.0 PHASE I ENIVRONMENTAL SITE ASSESSMENT

3.1 SITE DESCRIPTION

The Brownsville Site is a 1.43-hecatre property owned by the Canadian National (CN) Railway Company. The property is comprised of six (6) parcels (Parcel A, B, C, Rem-C, 7 and 8) (**Figure 2**).

Parcel A is occupied by Smallwood Sawmills, which carries out wood chipping activities on Site. Parcels B, C and the southwest portion of Rem-C are occupied by Lindal Cedar Homes, which uses the site for wood storage (i.e., warehousing) and distribution activities. Parcels 7, 8 and the northeast portion of Rem-C are occupied by Lyndowana Lumber Ltd, a private log salvage operation.

The Site is currently zoned IL-1 (light impact industrial zone). Site information is summarized in **Table 1**.

Table 1: Summary of Site Information

Common Name of Property	Brownsville Site	
Civic Address	Along Dyke Road, between Tannery Road and Old Yale Road, Surrey, BC	
Legal Description *(Note: the Site is not a separate legal property)*	Parcel A	(PARCEL BOOK 12 FOLIO 75, No.4114F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER
	Parcel B	(PARCEL BOOK 12 FOLIO 75, No.4113F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER
	Parcel C	(PARCEL BOOK 12 FOLIO 93, No.4222F) DISTRICT LOT 6 GROUP 2 NEW WESTMINSTER
	Parcel Rem-C	(PARCEL BOOK 12 FOLIO 78, No.4128F) DISTRICT LOT 5 GROUP 2 NEW WESTMINSTER
	Parcel 7	LOT 7 DISTRICT LOT 4 GROUP 2 PLAN 2620
	Parcel 8	LOT 8 DISTRICT LOT 4 GROUP 2 PLAN 2620
Parcel Identifier Number (PID)	Parcel A	012-878-260
	Parcel B	012-878-278
	Parcel C	012-878-286
	Parcel Rem-C	012-878-308
	Parcel 7	000-732-770
	Parcel 8	000-732-664

Latitude and Longitude	49°/ 12' / 56" N, 122°/ 53'/ 43" W			
Area	Parcel A	0.2 hectares		
	Parcel B	0.2 hectares		
	Parcel C	0.2 hectares		
	Parcel Rem-C	0.6 hectares		
	Parcel 7	0.2 hectares		
	Parcel 8	0.03 hectares		
	Total	1.43 hectares		
Registered Land Owner	CN Railway Company			
Zoning	IL- 1 (Light impact industrial zone)			
% Site Coverage	Parcel A	15% structures	85% asphalt	0% vegetation/bare
	Parcel B	10% structures	90% asphalt	0% vegetation/bare
	Parcel C	80% structures	20% asphalt	0% vegetation/bare
	Parcel Rem-C	0% structures	25% gravel	75% vegetation/bare
	Parcel 7	0% structures	0% asphalt	100% vegetation/bare
	Parcel 8	0% structures	0% asphalt	100% vegetation/bare
	Total	15% structures	35% asphalt/gravel	50% vegetation/bare

There are currently six (6) buildings on-Site (**Figure 2**), as follows:

1. Sawmill;
2. Green Chain;
3. Oil Storage Shed;
4. Storage Bunker (for hog-fuel);
5. Former Kiln (current warehouse); and
6. Warehouse/Distribution Building

Four (4) of the buildings (sawmill, oil storage shed, former kiln, warehouse/distribution) are currently active. The green chain and storage bunker are no longer in use. The on-Site buildings are discussed in more detail in **Section 3.3.1** of this report.

3.2 RECORDS REVIEW

Records were reviewed for items of environmental significance including historical facility locations, industrial/commercial activities on the Site, and concerns associated with the current and historical use of adjacent properties. Information sources reviewed as part of the records search were:

1. BC Water Well Database;
2. Topographical and geological maps;
3. The Green Lane, Environment Canada's World Wide Web Site;
4. Land title records (including a historical title search);
5. Aerial photograph library;
6. City of Surrey Street Directories;
7. Provincial Regulatory Requests
8. Insurers' Advisory Organization (IAO) records;
9. UBC Special Collections;
10. BC Heritage Resource Inventory;
11. BC Conservation Data Centre;
12. Previous environmental reports;
13. City of Surrey;
14. City of Surrey Fire Department;
15. Environment Canada records; and
16. Federal Contaminated Sites Inventory (FCSI).

3.2.1 Groundwater Wells

A search of the BC groundwater well database did not identify any on-Site groundwater wells. The provincial database search indicated that two (2) off-Site groundwater wells are located within 2.5 km of the Site. One well is located approximately 1.5 km to the southeast and up gradient of the Site, and the second well is located 2.5 km to the northeast and cross gradient of the Site. The current use of the groundwater wells is domestic. The groundwater well data is attached as **Appendix A**.

3.2.2 Geology, Topography and Drainage

A Geological Survey of Canada map *"1484A, Surficial Geology, New Westminster"* described the surficial geology for the Site as: Post-glacial Salish sediments, bog, swamp and shallow lake deposits, consisting of lowland peat up to 14 m thick, in part overlying Fraser River Sediments (overbank sandy to silt loam, and overbank silty to silt clay loam up to 2 m thick, overlying deltaic and distributary channel fill, sandy to silt loam, 10 m to 40 m thick).

In the previous Klohn-Crippen environmental report (Klohn, 1995), Site stratigraphy was described as: "variable fill 2.0 to 3.0 m thick (consisting of 1.0 to 3.0 m sand or sand and gravel overlying 1.0 to 1.2 m wood waste including hog-fuel) overlying a native silt stratum 1.2 to 3.7 m thick. The silt is underlain by variable thickness of sand and silt layers. Peat layers (0.3 m thick) are also identified at depths ranging from 7.0 to 8.0 m".

The Site does not have municipal storm sewer services. Parcels A, B and C have an engineered water conveyance system that includes a series of catch-basins and underground drainage lines that discharge directly into the Fraser River. Parcels Rem-C, 7 and 8, drain directly into and over the exposed grass, gravel and/or soil matrix.

The topography of the Site and surrounding area is generally flat lying. The flood potential of the Site is considered high as its elevation is at or near sea level.

3.2.3 Hydrogeology

In the previous environmental site investigation completed Klohn-Crippen in April 1995, the water table was encountered at depths ranging from 1.2 to 1.5 m below surface. The groundwater flow direction in water-bearing zone was inferred to be to the northwest (towards the Fraser River).

3.2.4 Precipitation Data

Environment Canada records indicated that the average annual precipitation reported at the Surrey Kwantlen Park station (approximately 2 km southeast of the Site) is 631.1 mm, based on data from 1971 to 2000. The monthly historic averages are provided in **Table 2.**

Table 2: Precipitation Values for Surrey Kwantlen Park Station

Month	Average Precipitation (mm)	Month	Average Precipitation (mm)	Month	Average Precipitation (mm)
January	202.2	May	92.3	September	71.7
February	158.5	June	73.6	October	152.5
March	146.3	July	52.9	November	239.9
April	116.4	August	50.7	December	228.9

3.2.5 Land Titles

A historical land title search for the Site, conducted through BC Online, indicated that the CNR Company is the current registered owner of the Site. The land title searches were conducted on the six (6) parcels that comprise the Brownsville Site (A, B, C, Rem-C, 7 and 8). The results of the title search are included in **Appendix B** and are summarized in **Table 3** below.

Table 3: Historical and Current Land Titles for the Brownsville Site

Parcel	Parcel Identifier (PID)	Registered Owner	Title Registration Received	Title Registration Entered	Title Cancelled
A	012-878-260	CNR Company	January 14, 1989	January 27, 1989	Current
B	012-878-278	CNR Company	January 14, 1989	January 27, 1989	Current
C	012-878-286	CNR Company	January 14, 1989	January 27, 1989	Current
Rem-C	012-878-308	CNR Company	January 14, 1989	January 27, 1989	April 15, 1991
Rem-C	012-878-308	CNR Company	April 15, 1991	April 15, 1991	Current
7	000-732-770	CNR Company	March 12, 1968	September 24, 1984	Current
8	000-732-664	CNR Company	May 9, 1983	May 9, 1983	October 19, 1984
8	000-732-664	CNR Company	September 13, 1984	October 19, 1984	Current

3.2.6 City Directory Search

The purpose of the directory search is to obtain an indication of past land use activities which may have resulted in the generation of constituents of potential concern (COPCs) on the Site, or on neighbouring properties with the potential for migration to the Site.

Hemmera conducted a search of the Greater Vancouver city directories at the Vancouver Public Library for addresses along Dyke Rd, Old Yale Road, Olsen Road, Tannery Road and Timberland Road within 300 m of the Site. The directories consulted were dated 2001, 1997, 1994, 1990, 1985, 1980, 1975, 1970, 1966 and 1959. Directories with listings for the Site were not available at the Vancouver Public Library. Directories with listings for the surrounding area were also not available for the period prior to 1959.

Within the time period (1959 to 2001) and the city blocks researched, the surrounding land use was predominantly industrial and commercial since 1959, with some residential listings present prior to approximately 1980 (no residential listing were observed after 1980). The surrounding land uses considered to potentially pose potential environmental concerns to the Site are presented in **Tables 4, 5, 6, 7 and 8**. These locations were selected based on their addresses being within 300 m of the Site, and on whether the names of historical occupants suggested possible industrial (or unknown, non-residential) activities. Where the name of a commercial business listed was ambiguous with respect to property use (e.g., it could be an office location rather than a servicing facility), this business may conservatively have been included in the tables below, based on other historical industrial occupants at the same address.

Table 4: Dyke Road Directory Search

Address	Occupants	Comments
10880 Dyke Road	Lindal Cedar Homes Ltd (1990 – 2001)	Approximately 50 m southwest of the Site
10862 Dyke Road	Supreme Shingle Manufacturers (1959) Brownlee Industrial Kiln Drying (1959)	Approximately 50 m southwest of the Site

Table 5: Old Yale Road Directory Search

Address	Occupants	Comments
11918 Old Yale Road	Capilano Timber Co Ltd (1980) Bridgeview Cedar Ltd (1966 - 1975) Brownsville Sawmills Ltd (1959 - 1975)	Approximately 50 m northeast of the Site
11919 Old Yale Road	Fraser River Metals Depot Inc (1970 - 1985) Stewart Hector Ltd (1970 - 1980)	Approximately 100 m northeast of the Site
11940 Old Yale Road	Brownsville Pub and RV Park (2001)	Approximately 25 m southeast of the Site

Address	Occupants	Comments
	Fraser River RV Park (1997)	
11975 Old Yale Road	Canwest Tanks Ecological Systems Ltd (2001). Whitewater Sewage Treatment (2001)	Approximately 180 m east of the Site
11987 Old Yale Road	New Horizons Autobody Ltd (1994 - 2001)	Approximately 250 m east of the Site
11999 Old Yale Road	Brownsville Auto Body (1990) J D S Automotive Ltd (1985)	Approximately 275 m east of the Site
12003 Old Yale Road	Amtrack Autobody Repairs Ltd (2001) Gerrys Auto Repair Mobile Mechanic (1997 - 2001) First Class Engine Servicing (1994 - 2001) First Class Truck Servicing (1990 - 2001) Zarin Construction Ltd (1997 - 2001) Surrey Frame and Alignment (1997) Transformers Auto Body Ltd (1990) Can Do Service (1990) Westcoast Neon Corp (1990) Marque Restorations (1985)	Approximately 300 m east of the Site

Table 6: Olsen Road Directory Search

Address	Occupants	Comments
10979 Olsen Road	Walrus Truck and Crane Service Ltd (1990 - 2001)	160 m southeast of the Site

Table 7: Tannery Road Directory Search

Address	Occupants	Comments
11691 Tannery Road	Leckie J Co Ltd (1966 - 1970) Imperial Lumber Wholesale (1959) Western Wood Mldg (1959)	Approximately 25 m to 75 m southwest of the Site
11715 Tannery Road	Apex Terminals Inc. (2001) Landucci Industries (2001) Protrux Systems Inc (2001) Imperial Lumber Ltd (1980 - 1997) Mcilveen Lumber Industries (1985 - 1997)	Approximately 20 m east of the Site

Address	Occupants	Comments
	Imp-Pac Trucking Ltd (1985 - 1990)	
No Address	Pacific Shore Lumber Products Ltd (1990) Alwood Manufacturers Ltd (1975) Canwood Lumber Manufacturing (1975) Lindal Cedar Homes Ltd (1975) Simplex Roofing & Sidewall Ltd (1975) Superior Shingles Ltd (1966 - 1975) Imperial Lumber Ltd (1966 - 1970) Brownlee Industries Co (1966 - 1970)	These directory listings did not contain any addresses, therefore the locations of these listings relative to the Site is unknown. As such there is a potential that any number of these industries may have been present within 300 m of the Site.

Table 8: Timberland Road Directory Search

Address	Occupants	Comments
10897 Timberland Road	A Q Timber Inc (1997) Coast Clear Wood Ltd (1990 - 1997) Triad Forest Products Ltd (1990 - 1997) BC Crossarm Co (1959 - 1985) Everwood Trading Ltd (1985) Kleysen Transport Ltd (1985) Orchardson forest Products Ltd (1970 - 1985) Bomanite Concrete Specialties (1975) C B M Enterprises Ltd (1975) Multi Lease Ltd (1975) Poucher H K Ltd (1975) Rapco-Foam Division of Bomanite Concrete Specialties (1975) Alden Developments (1970)	Approximately 25 m to 250 m southeast of the Site
10917 Timberland Road	David & Kwai Jade Arts Ltd (1980 - 1997) Spectrum Sailcraft Ltd (1975)	Approximately 260 m southeast of the Site
10985 Timberland Road	Arjay Industries Ltd (1990 - 2001)	Approximately 270 m southeast of the Site

Although the exact nature of the operations on the surrounding properties is not known, many of the business names imply historic industrial activities, including mill operations, auto repair and auto body shops, concrete manufacturing and a metals depot. Therefore, the nearby current and historic industrial activities up gradient of the Site have been conservatively identified as an APEC.

A copy of the city directory search is provided in **Appendix C.**

3.2.7 Provincial Regulatory Requests

The BC Online Site Registry is a database of sites having submitted information to the British Columbia Ministry Of Environment (BC MOE) with respect to the *Environmental Management Act*. A Site Registry search was conducted by using a 0.5 km search radius around the Site. The search of the registry produced four (4) records, the locations of which are illustrated on **Figure 3**. The results of the Site registry search are included in **Appendix D** and are summarized in **Table 9** below.

Table 9: Site Registry Search (0.5 km search radius)

Site ID	Last Updated	Address	Fee Category	Record Status	Notations
5440	March 12, 2004	10761 Dyke Road	Medium Site – Complex Contamination	Active – Remediation Complete	Conditional Certificate of Compliance (CCOC) issued
6114	February 13, 2002	11940 Old Yale Road	Unranked	Active – Under Assessment	Diesel spill reported on-site at RV site 44
2767	March 9, 2001	Underneath Skytrain and Patullo Bridge	Not Applicable	Active – Under Assessment	No activities reported
3722	February 21, 2003	125 Columbia Street, New Westminster	Medium Site – Simple Contamination	Active – Remediation Complete	CCOC issued

Site Record 5440 at 10761 Dyke Road and Site Record 3772 at 125 Columbia Street were not identified as APECs for the Brownsville Site, since CCOCs were issued by the MOE for each site and since Site Record 3772 is located across the Fraser River from the Site. Site record 2767, situated underneath the Skytrain and the Patullo bridges, was not considered an APEC since it is located cross gradient of the Site.

Site Record 6114 at 11940 Old Yale Road was identified as an APEC for the Brownsville Site due to its location (up gradient of the Site) and because the record status is "Active-Under Assessment". This record status indicates that the diesel spill reported for that site is currently under assessment, but a CCOC has not been issued (i.e., the site may not be compliant with the BC Contaminated Sites Regulation).

3.2.8 Insurers' Advisory Organization (IAO) Records;

No Fire Insurance Plans (FIPs) or IAO inspection reports concerning the Site were found during a search on the Brownsville Site conducted by Eva Michielutti of CGI Insurance Business Services. Refer to **Appendix E** for the response from CGI.

3.2.9 UBC Special Collections

A search of UBC Special Collections was also completed for fire insurance plans and historical land use plans for the Site. No fire insurance records were found for the Brownsville Site.

Land use plans were found for 1964 and 1980. The land use plans are included in **Appendix F** and were used to aid in the interpretation of the historical aerial photographs and historical and current information for adjoining properties.

The land use plan from 1964 indicates that at that time, Parcels A, B and C were occupied by Brown Lee Mills (wood processing and manufacturing), Parcels 7 and 8 were occupied by Brownsville Mills (wood processing and manufacturing) and Parcel Rem-C was vacant.

The land use plan for 1980 indicates that at that time, the land use for the Site (all parcels) was for manufacturing and processing wood. Specific company names were not identified.

3.2.10 Aerial Photographs

Aerial photographs were reviewed in order to log the progressive changes in the condition and land use patterns on the Site and adjacent properties.

Aerial photographs for 2004, 1994, 1984, 1979, 1971, 1963, 1952, 1948, and 1932 were reviewed with observations detailed below in **Table 10**. Copies of the aerial photographs are included in **Appendix G**.

Table 10: Aerial Photograph Summary

Year	Photograph#	Observation	
1932	A4508.5	Site	There are numerous house-sized buildings in Parcels B and C, likely homes or storage facilities for the fishing community. A light industrial area is evident with some larger warehouse sized buildings on Parcels 7 and 8.
		Northwest	Log booms are stored near the subject property on the Fraser River indicating that some milling operations could be present.
		Southwest	Woodland and/or agricultural land observed immediately adjacent to the Site. An industrial operation (likely wood processing and/or manufacturing) observed approximately 1 km to southwest.
		Southeast	Woodland and/or agricultural land.
		Northeast	Numerous house-sized and warehouse-sized buildings observed immediately to the northeast of Parcel 7, indicating industrial operations.
1948	BC 483:29	Site	Poor image quality due to shade from cloud cover. More development has occurred on Parcels 7 and 8.
		Northwest	No significant changes observed.
		Southwest	No significant changes observed.
		Southeast	No significant changes observed.
		Northeast	No significant changes observed.
1952	BC 1672:21	Site	Parcels A, B, C and Rem-C appear to be overgrown with vegetation; the house-sized buildings were removed. Some buildings appear to exist between the vegetation and the Brownsville Rail Spur. The light industrial area in Parcels 7 and 8 appears to be unchanged. Woods and farmland still exist inland from the Site.
		Northwest	No significant changes observed.
		Southwest	No significant changes observed.
		Southeast	A few buildings (likely Imperial Lumber) have been constructed on the opposite (southeast) side of the Rail Spur from the Site.
		Northeast	No significant changes observed.
1963	BC 5063:26	Site	Most of the vegetation has been removed from Parcels A, B and C. Large buildings appear to occupy these parcels to accommodate the mill operations (Brown Lee Mills). The mill appears to be in full production based on new building construction and wood storage. Several buildings exist in Parcels Rem-C, 7, and 8 with most of this area used for log and lumber storage (Brownsville Mills). Another new operation (BC Crossarm Ltd.) has appeared directly east (across the CN railway) of Imperial Lumber. Log booms continue to be stored adjacent to the Site on the Fraser River.
		Northwest	No significant changes observed.
		Southwest	Additional construction evident.
		Southeast	The mill opposite the Brownsville Rail Spur (Imperial Lumber) is still in production. New construction is visible inland, resulting in decreased woodland, vegetation and/or agricultural land.
		Northeast	More construction observed immediately adjacent to the Site to the northeast and newly constructed buildings are evident across Old Yale Road.

Year	Photograph#	Observation	
1971	BC 5406:180	Site	The large building on Parcel C has been removed. A large narrow building has appeared adjacent to where the Rail Spur and the CN Rail intersect (possibly the first phase of the current storage warehouse). The mills (Brown Lee Mills and the Brownsville Mill) appear in to be in full production based on smoke generation and Site activity (wood storage etc.). Log booms are stored near the Site on the Fraser River.
		Northwest	A smoke stack is active between the Rem-C Parcel and the Fraser River, indicating industrial activities.
		Southwest	No significant changes observed.
		Southeast	Mill operations (smoke, vehicles) observed, indicating the mills are in production. The inland area that is being used for woodland and/or agricultural purposes is largely unchanged.
		Northeast	No significant changes observed.
1979	BC 790/1:220	Site	The current storage facility for the mill is present on the Site (partially located on Parcel C). Parcels A and B have been converted into open lots for mill activities. New buildings have been constructed on Parcels A and B including the current sawmill (which includes the cut-off saw in-feet conveyor, side log lift and chipper) the chip fuel and hog fuel bunkers, the green chain, the oil shed and the kiln. Activities in Parcels Rem-C, 7, and 8 appear unchanged from previous photo.
		Northwest	New buildings that span the northwest property boundary of Parcels A, B and C are described above.
		Southwest	Vegetation has been cleared from the property southwest of the Site (adjacent to the Fraser River) and is being used as an open lot for industrial purposes.
		Southeast	The mills adjacent to the Site still appear to be in full production. Additional construction further inland observed.
		Northeast	No significant changes observed.
1984	BC 84013:197	Site	Vegetation has grown on half of the open lot south of the Site. The other half appears to be used for storage for the mill on Site. The activity on Parcels Rem-C, 7 and 8 appear to have slowed down as vegetation is beginning to grow in the area.
		Northwest	No significant changes observed.
		Southwest	Vegetation has grown on half of the open lot south of the Site. The other half appears to be used for storage for the mill on Site.
		Southeast	Industrial activity appears to have slowed down or halted adjacent to the Site. Additional construction further inland observed.
		Northeast	No significant changes observed.
1994	FFC 94#167	Site	Activity on Parcels Rem-C, 7 and 8 appears to have halted, as additional vegetation is present. The remaining areas on the Site appear unchanged from the previous photo.
		Northwest	No significant changes observed.
		Southwest	No significant changes observed.
		Southeast	The RV Park has appeared to the southeast of Parcel 7.
		Northeast	No significant changes observed.
2004	SRS 6912, 422	Activities appear unchanged from previous photos.	

Based on the aerial photographs reviewed, industrial wood processing and wood manufacturing mills have operated on-Site from at least 1932 to present. The exact nature and locations of historic mill operations is unknown, therefore historic on-Site industrial operations were identified as an APEC. The current and historic surrounding land uses described above are also outlined on **Figure 3**.

3.2.11 BC Heritage Resource Investigation

A search by the Archaeological Information Services of the BC Ministry of Sustainable Resource Management indicated no archaeological site records in the area of the Site. The correspondence from the Archaeological Information Services of the Ministry of Sustainable Resource Management is attached in **Appendix H**.

3.2.12 BC Conservation Data Centre

A search of the provincial database indicated that three (3) element occurrences on the blue-list were mapped in the area of the Site. The results of the Conservation Data Centre search are attached in **Appendix I** and are summarized in **Table 11** below.

Table 11: CDC Element Occurrences (EO)

Element Occurrence Record	Species	Location	Status
3010	Elatine Rubella (Three-flowered Waterwort)	Patullo Bridge, East side of Fraser River	Blue list
3412	Carex scoparia (Pointed Broom Sedge)	Patullo Bridge, East side of Fraser River	Blue list
3276	Lindernia dubia var. anagallidea (False-pimpernal)	Fraser-Surrey Docks	Blue list

The blue-list includes any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in British Columbia. The elements are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed elements are at risk, but are not extirpated; endangered or threatened,

and therefore do not require investigation. The three (3) element occurrences in the area of the Site would not effect future land use decisions.

3.2.13 Previous Environmental Reports

The following reports were provided by the Fraser River Port Authority and reviewed by Hemmera (a brief summary is provided below):

1. Keystone Environmental Ltd., *Evaluation of Environmental Investigation Status - Brownsville / Port Mann CN Land Swap, Surrey, BC.* September 16, 2002.

The Keystone report (2002) evaluates the potential land swap between the Fraser River Port Authority and CN Railway. The report identified eight (8) areas of potential environmental concern (APECs) on-Site including; the former sawmill (located on-Site since 1926), the green-chain, fill present on-Site (including pre-load fill, oil stained soils and metal debris), former pentachlorophenol (PCP) praying tank and storage, fuel storage shed, petroleum hydrocarbon soil contamination identified in Klohn-Crippen report (1995), surface oil staining identified in PWGSC report (1996) and adjacent rail spur and industrial up gradient properties.

2. Fraser River Port Authority, *Environmental Audit, On-Site Inspection Report – Generic.* July 31, 2000.

The Fraser River Port Authority report (2000) is an environmental audit/on-Site inspection of Parcels A, B and C of the Brownsville Site. The report resembles a Phase 1 ESA, but does not meet the requirements of a CSA Phase 1 ESA. The report provides a description of Site operations, a Site inventory, and results of a Site inspection. The report identified a UST (septic tank), an AST (diesel), fuel storage (oil drums), and oil staining under the cut-off saw in-feet conveyor.

3. Public Works and Government Services Environmental Services (PWGSC), *Environmental Audit Report - Brownsville/Port Mann CN Land Swap, Surrey BC.* August 23, 1996.

The PWGSC report (1996) is an environmental audit of the Brownsville Site and the Port Mann site as part of the proposed CN land swap. PWGSC identified potential environmental issues on-Site including an oil stain near the Brownsville spur and the oil storage shed. A PCP dip-tank was

also identified immediately outside the boundaries of Parcels 7 and 8. PWGSC stated that there was no reason to suspect PCP contamination because the base of the tank was concrete. Also discussed were previous soil samples collected by Klohn-Crippen (1995) and BC Research Corporation (1991).

4. Klohn-Crippen Consultants Ltd., *Fraser River Harbour Commission, Lindal Cedar Homes Sawmill Expansion, Surrey BC - Preliminary Geotechnical and Environmental Assessments*. April 1995.

The Klohn-Crippen report (1995) presented preliminary geotechnical and environmental assessments for a proposed sawmill expansion at Lindal Cedar Homes Ltd. Five (5) test-holes were drilled and (3) monitoring wells were advanced as part of the investigation. Of the eight (8) investigation locations, one (1) monitoring well and one (1) test-hole were located on the Brownsville Site. Klohn-Crippen identified potential environmental issues including the presence of hog-fuel (particularly within the northwest portion of the Site), and one (1) mineral oil and grease soil sample that exceeded provincial environmental criteria (located off-Site, down gradient and to the north of Parcel 7).

5. British Columbia Research (BCR) Corporation, *Follow-Up Phenols Testing for Brownsville Site*. May 30, 1991 and *CNR Brownsville Site Soils Assessment Program.* April 12, 1991

During their 1991 investigation on the Site, the British Columbia Research Corporation (BCR) drilled one shallow borehole into the fill materials on each Site Parcel (a total of six boreholes, each up to 1.5 m bgs). Two (2) samples were collected from each location and analyzed for metals, total phenols, and polycyclic aromatic hydrocarbons (PAHs). The PAH and total phenols numbers were compared to the current Contaminated Sites Regulation (CSR) standards and one sample (collected from Parcel A) exceeded the current CSR standards for phenols. The exceedance was historically addressed by submitting eight (8) additional samples from Parcel A for phenols analysis. Given that the additional samples had phenols concentrations below CSR standards, it is likely that the original sample that exceeded was a very localized situation or possibly a laboratory error. Therefore, phenols do not appear to be a COPC in the site fill materials.

The BCR 1991 metals analysis could not be directly compared to the CSR since the current CSR Standards for soil require pH measurements to interpret metals concentrations in soils and BCR did not collect pH measurements during their investigation. However, a conservative review of the historic data was possible considering the lowest pH as a conservative measure. Using this approach, zinc concentrations exceeded CSR standards in samples collected from Parcels A and C, but no other metals concentrations exceeded the CSR standards.

3.2.14 Federal Contaminated Sites Inventory (FCSI)

A search of the Federal Contaminated Sites Inventory (FCSI) on the Treasury Board of Canada Secretariat website was conducted by Hemmera. No federal contaminated sites were found within a 1.0 km radius of the Brownsville Site. A map of federal contaminated sites search is provided in **Appendix J**.

3.2.15 Adjacent Areas

The Site is bounded by water-lots to the northeast and northwest (situated between the Site and the Fraser River, owned by the Government of Canada and administered by the FRPA). The Site is also bounded by the Brownsville Rail Spur and the CN Rail Line to the southeast, residentially – zoned lands intended for subdivision development to the southwest of Parcel A, and a vacant asphalted lot immediately to the northeast of Parcel 7. Additional industrial, commercial and residential properties lie beyond the rail lines, to the southwest and northeast.

A Recreational Vehicle (RV) park is located to the southeast of Parcel 7 and 8 at 11940 Old Yale Road (up gradient of the site). A Site registry search indicated a diesel spill had occurred at the RV Park in 1999. The current environmental record status is “Active-Under Assessment”. Due to the location of the RV Park (adjacent and up gradient of the Brownsville Site), and lack of information with respect to the status of the assessment, the RV Park was conservatively identified as an APEC.

Reportedly, the area immediately to the southeast of Parcels 7 and 8 historically contained a PCP spray-tank and treated wood storage. According to the 1996 PWGSC report (and also discussed in 2002 Keystone report), these activities were carried out immediately to the southeast (i.e., up gradient) of Parcels 7 and 8 (between the Site property boundaries and the CN rail line). The exact

location and nature of the PCP spray-tank is unknown, therefore this has been conservatively identified as an APEC.

In general, the up gradient industrial activities to the south and southeast of the Brownsville Site have been conservatively identified as an APEC, as discussed in **Section 3.2.6** of this report.

An environmental record was identified during the Site registry search for 10761 Dyke Road (cross gradient of the Site with respect to groundwater flow direction). A detailed site investigation was conducted at 10761 Dyke Road and a certificate of compliance (COC) was issued in 1998. Therefore, this site is not considered an APEC for the Brownsville Site.

Historical and current information for the adjacent properties is summarized in **Table 12** and on **Figure 3**.

Table 12: Historical and Current Information for the Adjacent Properties

Orientation	Property	Approximate Distance from Site	Activity	Years Present	Information Sources Used
Northwest (down gradient) of Site between the Brownsville Site and the Fraser River	Government of Canada owned water lots – administered by the FRPA	Immediately adjacent to the Site	Mill Operations	At least 1932 to present	Records review, Site visit
Northwest of Parcel A (down gradient)	Smallwood Mills Sawmill (subsidiary of Mill and Timber Products Ltd.)	Immediately adjacent to Parcel A and spanning the northwest property boundary along Parcel A	Sawmill - various equipment and auxiliary operations including: cut-off saw in-feet conveyor, side log lift, chipper, chip fuel and hog fuel bunkers, green chain and office trailers.	At least 1979 to 2001	Records review, Site visit
			Chipping, chip fuel bunker and office trailers continue to be used. Remaining sawmill functions no longer operating although buildings and machinery still present.	2001 to present	
			Diesel AST	Early 1990's to present	

Orientation	Property	Approximate Distance from Site	Activity	Years Present	Information Sources Used
Northwest of Parcels B, C and the southern portion of Rem-C (down gradient)	Lindal Cedar	Immediately adjacent to Parcels B, C, and the southern portion of Rem-C (also occupies large portion of Parcels B and C)	Wood warehousing and distribution	At least 1971 to present	Records review, Site visit
Northwest of Parcels 7, 8 and the northern portion of Rem-C (down gradient)	Government of Canada owned water lots – administered by the FRPA	Immediately adjacent to Parcels 7, 8 and the northern portion of Rem-C	Mill operations	At least 1932 to approximately 1984	Records review, Site visit
			Wood and log storage	At least 1932 to present	Records review, Site visit
Northeast of Parcel 7	Vacant lot	Immediately adjacent to Parcel 7	Vacant asphalted	At least 1996 to present	Records review, Site visit
Southeast of the Site (up gradient)	CN Rail	Immediately adjacent to the Site	Railway	At least 1932 to present	Records review, Site visit
	Brownsville Rail Spur	Immediately adjacent to the Site	Railway	1891 to present (active from 1891 to 1930)	Records review, Site visit
	CN Rail Property	Adjacent to the Site, between the property boundaries of Parcels 7 and 8, and the CN railway	PCP spray tank	At least 1979 to 1980	Records review
Southeast of Parcels 7 and 8 (up gradient)	RV park	Adjacent to Site, across CN railway	RV park/campground	At least 1989 to present	Records review, Site visit
Southwest of Parcel A	Light Industrial	Immediately adjacent to Parcel A	Wood processing, manufacturing and shingle manufacturing	At least 1932 to 1990	Records review
	Subdivision	Immediately adjacent to Parcel A	Proposed subdivision – residentially zoned	Approximately 1990 to present	
South, southeast and southwest of all Site Parcels, across railways (up gradient)	Light Industrial Zones, Residential	Across railways, within 0.5 km of Site	Mill operations, lumber storage, auto repair and auto-body shops, concrete manufacturing, metals depot, some residential	At least 1952 to present	Records review, Site visit

3.2.16 Municipal Regulatory Requests

City of Surrey

Hemmera contacted the City of Surrey regarding the following information for the Site:

- Building, lease and property use records;
- UST and above ground storage tank (AST) information;
- Bylaw and/or environmental legislation infractions;
- Dredged materials or other soils used as fill on-Site;
- Records of responses by the Fire Department;
- Permits of an environmental nature;
- Records of hazardous materials storage or spills;
- Any other environmental concerns; and
- Copies of services connections to the Site.

A copy of the response from the City of Surrey is provided in **Appendix K**. The City of Surrey indicated that information pertaining Parcels 7 and 8 was found during the course of the file review (Parcel A, B, C and Rem-C information was not found). The City of Surrey provided the following information:

- Parcels 7 and 8 are currently zoned "Light-Impact Industrial Zone-1 (IL-1)". The city zoning by-law was included within the response; and
- A search of the City Engineering File Registry (from 1985 to present) indicated that no file records were found.

3.2.17 City of Surrey Fire Department Records

The Surrey Fire Department was contacted by Hemmera to conduct an environmental records search for the Site. The following information was requested:

- Underground and aboveground storage tank installation and decommissioning;

- Records of any responses by the Fire Department to the site (i.e. fires, explosions, etc.);
- Records of any historical hazardous materials storage, or spills; and
- Other environmental concerns.

A copy of the response from the Surrey Fire Department is provided in **Appendix L**. A number of fire incidents were reported at the property over the past 15 years, but there is no record that these fires involved hazardous material spills or underground storage tanks for flammable and combustible liquids.

3.2.18 Environment Canada Records

The Environmental Protection Branch of Environment Canada (EC) was contacted to inquire whether EC had any information on file regarding spills or any other federal violations pertaining to the Site. A copy of the response from EC is provided in **Appendix M**.

Specifically, the EC search included:

- Company notification to Environment Canada of PCB storage in British Columbia; and
- Inspections records in BC of non-compliance with the acts and regulations administered by Environment Canada (*C.E.P.A*. and the pollution provisions of the *Fisheries Act*).

The EC records in the Pacific and Yukon Region indicated no problems in the above areas, though the database includes reports of PCB's in use on-Site. This is discussed in more detail in Section 3.3.14 of this report.

3.2.19 Site Lease Agreements/Permits

CNR was contacted to provide information concerning current and historical Site lease agreements. Copies of the lease agreements provided by CNR are provided in **Appendix N** and include:

- Lease 1 (CNR 10787) – Lindal Cedar Homes – Lumber/Forest Products, Mill/Plant;

- Lease 2 (CNR 5077-A) – Lindal Cedar Homes - Lumber/Forest Products, Mill/Plant;
- Lease 3 (MR 161) – BC Hydro – Wire Crossing;
- Lease 4 (MR 4227) – Telus – Wire Crossing;
- Lease 5 (820/1202-C-1-A) – Fraser River Harbour; and
- Lease 6 – (820/1202-C) – FRPA.

The FRPA provided Hemmera with a copy of a permit that granted permission to Lyndowana Lumber Ltd. to use and occupy a portion of the foreshore, the bed of the Fraser River, and Parcels 7 and 8. The permit was issued for the following portion of the foreshore:

- Permit – 0.4046 ha. (1 ac.). Foreshore fronting portion of Parcel C, D.L. 5, Gp. 2, N.W.D. and Lot 7 and 8, D.L. Gp 2, Plan 2620.

The agreement is dated March 11, 2003 and was issued for a period of two (2) years. According to FRPA staff, Lyndowana Lumber Ltd. has been asked to vacate the area by September 2006. A copy of this permit is provided in **Appendix N.**

3.3 SITE VISIT

Hemmera representatives conducted a Site visit on April 13, 2006 accompanied by Mr. Nures Kara of the Fraser River Port Authority. Mr. Kara is currently the manager of Environmental Services for the Fraser River Port Authority and has approximately eight (8) years of direct Site knowledge.

The Site visit included a review of the Site buildings for evidence of chemical handling, spills, storage tanks, the presence of PCBs, asbestos-containing materials, lead-based paint, and ozone-depleting substances, as well as other potential environmental concerns (i.e. site proximity to sensitive areas, potable water supply, activities on adjacent properties). During the Site visit, Site conditions were documented as well as activities on adjacent off-Site properties. Photographs taken during the April 13, 2006 Site visit are attached in **Appendix O** and a description/summary of the photographs are provided in **Table 13**.

Table 13: Site Visit Photograph Summary

Photo #	Location	Description
1	Parcel A	Sawmill – looking SE
2	Parcel A	Sawmill – looking NW
3	Parcel A	Oil storage shed – looking SE
4	Parcel A	Oil storage shed - interior
5	Parcel A	Hog-fuel bunker – looking SW
6	Parcel A	Green chain – looking SW
7	Parcel B	Kiln (current warehouse) – looking SW
8	Parcel C	Distribution warehouse – looking SE
9	Rem-C	Rem-C – looking NE
10	Parcels 7, 8	Salvage log storage
11	Off-Site	Office trailers
12	Off-Site	Chip fuel bunker
13	Off-Site	RV Park
14	Off-Site	AST (diesel) – down gradient
15	Parcel A	Oxygen/Acetylene canisters
16	Parcel A	Chemical storage - oil
17	Off-Site	Drain out fall – bank of Fraser River
18	Parcel A	Pole-mounted transformer
19	Parcel A	Mill electrical building

3.3.1 On-Site Features and Buildings

The following on-Site features and buildings were identified during the Site visit (locations of features and buildings are presented in **Figure 2** and Site photographs are presented in **Appendix O**).

Table 14: On-Site Features and Buildings

Parcel	Feature/ Building	Construction/Condition	Current Use	Historic Use	Photo #
A	Portion of Saw mill (includes cut-off saw in-feet conveyor, side log lift, chipper)	Concrete slab-on-grade construction with logs as vertical support posts (potentially treated with phenols and/or creosote), metal siding, metal roofing, and open to the elements. The concrete floor is in fair condition (no obvious large cracks) and is also open to the outside.	Chipping operations	Saw mill, industrial mill operations	1, 2
	Oil storage shed	The building is constructed of a wood timber floor and wood roof (with some shingles). The shed is in poor condition and is open to the elements.	Oil/fuel storage	Oil/fuel storage, industrial mill operations	3, 4
	Storage Bunker (hog fuel)	Constructed of steel (rust observed on exterior).	Not in use	Hog fuel storage, industrial mill operations	5
	Portion of Green Chain	The building is constructed of a wood roof, and logs as vertical support posts (potentially treated with phenols and/or creosote). The area directly beneath the chain mechanism is concrete of unknown condition, is covered with sawdust and woodchips, and is at a lower elevation than the surrounding asphalt.	Not in use	Industrial mill operations	6
B	Kiln	The building has a concrete slab-on-grade floor, brick-wall construction, a metal roof, and is open to the elements.	Storage Facility	Kiln, Industrial mill operations	7
C	Portion of distribution Warehouse	The warehouse is wood framed, metal-roofed, has a concrete slab-on-grade floor, and is open to the elements.	Mill warehouse and distribution	Mill warehouse and distribution, Industrial mill operations	8
Rem-C	Log Storage	Currently vacant of buildings.	Lumber/Log storage	Lumber/log storage, Industrial mill operations	9
7	Log Storage	Currently vacant of buildings.	Lumber/Log storage	Industrial mill operations and wood/log storage	10
8	Log Storage	Currently vacant of buildings.	Lumber/Log storage	Industrial mill operations and wood/log storage	10

* These logs reportedly in the process of being removed.

The Oil Storage Shed was identified as an APEC because extensive staining was observed inside and outside of storage shed, unprotected drums are stored outside of the shed, there is no secondary containment for drums inside the shed, and the shed building is in poor condition and is open to the elements. The Green Chain was also identified as an APEC because petroleum hydrocarbon odours

and potential staining were observed beneath the green chain during Hemmera's 2006 Site visit, and the condition of the concrete floor beneath the Green chain is unknown.

3.3.2 Off-Site Features and Buildings

Various off-Site features and buildings in the vicinity of the Brownsville were identified during the Site visit. The locations of features and buildings are presented in **Figure 2** and Site photographs are presented in **Appendix O**. The identified off-Site buildings are summarized in **Table 15** below:

Table 15: Off-Site Features and Buildings

Location	Feature/Building	Current Use	Historic Use	Photo #
Northwest of Parcels A, B, C	Portion of Saw mill (includes cut-off saw in-feet conveyor, side log lift, chipper)	Chipping operations	Saw mill	1, 2
	Portion of distribution warehouse	Mill warehouse and distribution	Mill warehouse and distribution	8
	Portion of Green Chain	Not in use	Milling	6
	Operations trailers	Mill operations (offices, washroom)	Mill operations (offices, washroom)	11
	Storage Bunker (likely chip fuel)	Chip fuel storage	Chip fuel storage	12

3.3.3 Above Ground Storage Tanks (ASTs) and Underground Storage Tanks (USTs)

One (1) on-Site AST (propane), one (1) off-Site AST (diesel) and one (1) off-Site UST (septic) were identified during the Site visit. Details of the ASTs and USTs are provided below.

ASTs

Table 16 below summarizes the on-Site AST information collected during the Site visit and the records review. One (1) on-Site AST was identified.

Table 16: On-Site AST

Location	Type of Tank	Volume	Age	Comments
Parcel C	Propane	500 gallons	5-7 years	AST is in good condition

Table 17 below summarizes the off-Site AST information collected during the Site visit and the records review. One (1) off-Site AST was identified:

Table 17: Off-Site AST

Location	Type of Tank	Volume	Age	Comments	Photo #
Northwest of Parcel A (down gradient)	Diesel	500 gallons	12-15 years	This AST is located down gradient of Site. The AST is covered and has a containment basin. It is located approximately 1.5 m above the ground and the ground surface beneath the tank is bare (no asphalt or concrete base). Diesel odours were observed within soil and woodchips beneath the AST. A spill kit was observed near the tank. Minor tank rust was noted on the AST.	14

USTs

The off-Site UST (septic) located down gradient of Parcels A and B is not considered a potential environmental concern to the Site (because of its down gradient location from the Site). This septic tank is currently used by the Lindal Cedar Homes and Smallwood Sawmills trailer offices.

3.3.4 Chemicals and Fuel Handling and Storage

Based on the Site visit and records review various chemicals are currently and were historically used and stored on the Site. These chemicals include diesel, fuel oil, lubricants, engine oil, and oxygen canisters. Details of chemical storage and use on the Site are summarized in the sections below. According to FRPA and Smallwood Sawmills, PCP was never used on the Site (although it was reportedly used immediately up gradient of Parcels 7 and 8, as discussed in Section 3.2.15 of this report).

Sawmill (Parcel A)

During Hemmera's Site visit, six (6) pressurized gas cylinders were observed within the footprint of the sawmill. The cylinders were stored in well-ventilated areas and were observed to be upright and in fair condition. Four (4) of six (6) cylinders were labelled oxygen (according to Smallwood Mills staff, these are used for welding purposes). The remaining two (2) cylinders contain unknown pressurized gases (Smallwood Sawmills staff indicated that they likely contain acetylene) (**Photo 15** in **Appendix O**). No current or historic welding shops or specific welding areas were observed or reported at the Site.

In additional, six (6) partially filled five (5)-gallon plastic buckets/metal cans of engine oil were located within the footprint of the mill. The buckets/cans were observed to be in good condition, had sealed covers and were situated on an asphalt surface. No obvious oil staining was observed on the surface of the asphalt (**Photo 16** in **Appendix O).**

Oil was historically used for the cut-off saw operations and lubrication. Oil stains were noted in the vicinity of the cut-off saw by the FRPA in 2000, but were not observed during Hemmera's 2006 Site visit. According to FRPA staff, the historic oil stains were situated off-Site and down gradient of Parcel A. Therefore, these are not considered an APEC for the Brownsville site.

Oil Storage Shed (Parcel A)

The current and historic use of the oil storage shed is for oil and diesel fuel storage. There are currently 20 partially filled 55-gallon drums of diesel fuel and oil stored in the area of the shed. The shed interior contains 15 drums, five (5) of which are arranged horizontally on wooden cradles, with a steel drip tray located beneath the dispensing mechanisms of these drums. The other ten (10) drums are positioned vertically on the wood floor of the shed, with sealed covers and/or lids. The remaining five (5) drums are located at the northwest exterior of the shed.

Oil staining was observed on the shed floor (interior) and on the soil ground surface (exterior) immediately surrounding the shed. The shed does not have secondary containment for the drums. Due to the extensive staining observed, the lack of secondary containment, and the poor condition of the building, the oil shed was identified as an APEC for the Brownsville Site.

Hog Fuel Storage Bunker (Parcel A)

The storage bunker is currently not in use, but was historically used for hog fuel storage. No chemicals are known to be currently or have been historically stored in the bunker**.**

Green Chain (Parcel A and B)

The green chain is currently inactive, and was historically used for milling operations. The green chain building has a wood roof, and treated logs (potentially phenols and creosote) as vertical support posts (**Photo 6** in **Appendix O**). The area directly beneath the chain mechanism is concrete of unknown condition, is covered with sawdust and woodchips and is at a lower elevation

than the surrounding asphalt. A catch basin (part of the Site drainage system) is located one (1) metre northwest of the green chain.

No chemicals are currently or were historically stored in the green chain area. Oil was historically used for the green chain operations and lubrication. The sawdust, wood chips and soil directly beneath the chain are stained and potentially impacted with petroleum hydrocarbons (based on petroleum hydrocarbon odours observed during Hemmera's Site visit). Because the condition of the concrete floor beneath the green chain is unknown and may contain cracks or holes that could permit potential contaminants to migrate to the subsurface soils, the green chain was conservatively identified as an APEC.

Kiln (Parcel B)

The kiln is currently used as a lumber/wood storage area, and was historically used as natural gas-fired kiln to dry green lumber prior to planing and packing (**Photo 7** in **Appendix O**). No chemicals are known to be currently or were historically stored in the kiln.

Distribution Warehouse (Block C)

The warehouse is currently and was historically used as a warehouse, for distribution and planing. No chemicals are known to be currently or were historically stored in the warehouse.

3.3.5 Historic Landfills, Dumpsites and General Waste Management Practices

General Waste Management Practices

Solid waste generated on-Site is disposed into garbage bins, which are supplied by BFI. BFI empties the bins regularly for off-Site disposal. Wood waste and other materials not suitable for regular garbage disposal are disposed into bins supplied by Bullet Disposal Company. Bullet Disposal Company regularly empties the bins for off-Site disposal.

During Hemmera's 2006 Site visit, various discarded materials were observed around the Site (e.g. small pieces of abandoned machinery, tires, wood pallets, scrap wood, etc.) particularly on Parcel A (in the vicinity of the sawmill). The assumption of a property with waste materials could represent a liability to FRPA, since the cost and responsibility associated with the appropriate off-site disposal of these materials would also be assumed. These waste materials would not likely

result in Site contamination and do not represent an immediate environmental concern, but could result in minor surficial staining or soil impacts (which could be removed in conjunction with the waste materials removal). Prior to the proposed property transfer, it is recommended that FRPA identify and quantify the on-Site waste materials in order to assess future disposal costs.

Site Fill Materials

Based on historic boreholes completed on and near the Site by others, it is expected that the top 2 to 3 metres of the Site soils consist of fill materials, including wood waste and sand fill. The age and origin of these fill materials in unknown, therefore it is possible that they could have been imported from an industrial site. As such, the potential presence of extractable petroleum hydrocarbons (EPH), phenols and metals within these fill materials is a possible concern.

During their 1991 investigation on the Site, the British Columbia Research Corporation (BCR) drilled one shallow borehole into the fill materials on each Site Parcel (a total of six boreholes, each up to 1.5 m bgs). Two (2) samples were collected from each location and analyzed for metals, total phenols, and polycyclic aromatic hydrocarbons (PAHs). The PAH and total phenols numbers were compared to the current Contaminated Sites Regulation (CSR) standards and one sample (collected from Parcel A) exceeded the current CSR standards for phenols. The exceedance was historically addressed by submitting eight (8) additional samples from Parcel A for phenols analysis. Given that the additional samples had phenols concentrations below CSR standards, it is likely that the original sample that exceeded was a very localized situation or possibly a laboratory error. Therefore, phenols do not appear to be a COPC in the site fill materials.

The BCR 1991 metals analysis could not be directly compared to the CSR since the current CSR Standards for soil require pH measurements to interpret metals concentrations in soils and BCR did not collect pH measurements during their investigation. However, a conservative review of the historic data was possible considering the lowest pH as a conservative measure. Using this approach, zinc concentrations exceeded CSR standards in samples collected from Parcels A and C, but no other metals concentrations exceeded the CSR standards.

Neither BCR nor Klohn analyzed any soil or groundwater samples for extractable petroleum hydrocarbons (the primary Site COPC) during their historic Site investigations. Therefore, given