PHASE I
ENVIRONMENTAL SITE ASSESSMENT

Pipseul IR #3,
Lower Nicola Indian Band
Merritt, British Columbia

Prepared for

Lower Nicola Indian Band
181 Nawishaskin Lane
Merritt, B.C. V1K 0A7

Submitted by

Columbia Environmental Consulting Ltd.
RR#2, Site 55, Compartment 10
Penticton, BC. V2A 6J7

Project No: 10-0374
April, 2011

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April 30, 2011

Lower Nicola Indian Band
181 Nawishaskin Lane
Merritt, B.C. V1K 0A7

Attention: John Keating and Sharon Parsons, LNIB Lands and Leasing Office

Subject: Final Phase I Environmental Site Assessment (ESA) of the Pipseul Indian Reserve # 6, Lower Nicola Indian Band, Merritt, BC.

We trust that this final report meets your present needs. Two hard copies of the final report and a CD-ROM including the source files and an Adobe pdf version will be provided upon receipt of your review. Please do not hesitate to call if you have any questions or comments, or if you require anything further.

Yours truly,

Columbia Environmental Consulting Ltd.

Per: Dwight Shanner, R.P.Bio
Project Manager

EXECUTIVE SUMMARY

Columbia Environmental Consulting Ltd. (Columbia) was contracted by the Lower Nicola Indian Band (LNIB) on behalf of Indian and Northern Affairs Canada (INAC) to conduct a Phase I Environmental Site Assessment (ESA) of the Pipseul Indian Reserve #3, herein referred to as the "Site".

The first step in site characterization is to conduct a Phase I ESA. During this phase, information is gathered about site layout and previous activities and/or operations that may have caused contamination at the Site. The Phase I ESA consisted of the following:

- records review;
- interviews with regulatory officials and personnel knowledgeable about the Site;
- site reconnaissance; and
- information evaluation and preparation of the report provided herein.

The Phase I ESA was conducted as per the requirements of the CSA document *Z768-01 Phase I Environmental Site Assessment, April 2003*. The Phase 1 ESA focused on preliminary areas of interest identified through historical document review, and interviews. In general, all residential structures were excluded unless information was gathered to suggest contamination or external visual observations indicated potential contamination. Specific residential structures listed for inspection at the request of the First Nation or INAC require the permission from the First Nation and the Certificate of Possession holder.

The Pipseul IR #3 is comprised of approximately 220 acres on one reserve. The reserve is rectangular in shape with Guichon Creek flowing from the north to the south through the eastern portion of the reserve. The majority of the reserve is undeveloped with Highway 97 and a gas pipeline right-of way cutting across the north east corner of the reserve. A former Concrete Plant at the north end of the reserve was the only development.

The Former Concrete Plant identified during the Site visit is an APEC and its associated contaminants of potential concern (COPC) are provided below.

Table A. Areas of Potential Environmental Concern (APECs)

APEC	Description of Contamination or Risk	COPC
APEC 1 Former Concrete Plant UTM 10.654938.5592863	The Former Concrete plant contains a scattered waste including metals, discarded hydrocarbon containers, and building materials. Debris is located between the hillside and Guichon Creek. Gravel extraction was identified for site operations in addition to the former batch plant.	• Metals • PAH • PHC • VOC • Asbestos
Offsite APEC 2 Gas pipeline R/W 10.654938.5592863	The gas transmission pipeline has been in place since 1956 where equipment for maintenance may have leaks and gas leaks have the potential for explosions.	• Metals • PHC

PAH = Polycyclic Aromatic Hydrocarbons, VOC = Volatile Organic Compounds, PHC = Petroleum Hydrocarbons including F1, F2, F3 and F4 fractions, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

A Phase 2 ESA is recommended to determine the presence or absence of contaminated media at APEC 1 identified by this assessment.

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1.0 INTRODUCTION

Columbia Environmental Consulting Ltd. (Columbia) was commissioned by the Lower Nicola Indian Band (LNIB) on behalf of Indian and Northern Affairs Canada (INAC) to conduct a Phase I Environmental Site Assessment (ESA) of the Pipseul Indian Reserve #3, herein referred to as the "Site".

The Site is located on 1:50,000 NTS mapsheet 092P07 and is approximately 3 km south of the town of Logan Lake B.C. The Site's geographic position relative to the surrounding features is shown on Figure 1, included in Appendix A.

The Phase I ESA follows procedures outlined in the Canadian Standards Association (CSA) document *Z768-01 Phase I Environmental Site Assessment, April 2003.* This report will be used in making decisions concerning whether further investigation and or remediation is necessary. John Keating and Sharon Parsons (LNIB Lands and Leasing Office) provided written authorization for the project

1.1 OBJECTIVE

The objective of this Phase I ESA is to identify and document any actual or potential human health or environmental risks associated with the Site and provide recommendations for further assessment and/or risk management. The "Areas of Potential Environmental Concern" (APECs), with their associated "Contaminants of Potential Concern" (COPC), and the person or agencies that may be responsible for causing the contamination define these risks.

1.2 SITE BACKGROUND

The Pipseul IR #3 is comprised of approximately 220 acres on one reserve. The reserve is rectangular in shape with the long edge oriented north. Guichon Creek flows from the north to the south through the eastern portion of the Site. The majority of the reserve is undeveloped with Highway 97 cutting across the north east corner of the reserve and one former Concrete Plant at the north end as the only developments. Some remnants of the concrete plant were the only known anthropogenic objects on the reserve and are shown on Figures 1 and 2. A natural gas pipeline right of way runs through the northeast corner, two pipelines have been installed one in 1956 and another in 1971.

2.0 SCOPE OF WORK

The first step in Site characterization is to conduct a Phase I ESA. During this phase, information is gathered about Site layout and previous activities and/or operations which may have caused contamination at the Site.

The Phase I ESA consisted of the following:

- records review;

- interviews with regulatory officials and personnel knowledgeable about the Site;
- Site reconnaissance; and
- information evaluation and preparation of the report provided herein.

The Phase I ESA was conducted as per the requirements of the CSA document *Z768-01 Phase I Environmental Site Assessment, April 2003*.

The Phase 1 ESA focused on preliminary areas of interest identified prior to the Site visit, through historical document review, and interviews. A list of these areas is included in Section 5.1.1. In general, all residential structures were excluded unless information was gathered to suggest contamination or external visual observations indicated potential contamination. Specific residential structures listed for inspection at the request of the First Nation or INAC require the permission from the First Nation and the Certificate of Possession holder.

3.0 METHODOLOGY

3.1 RECORDS REVIEW

The applicable search distance for the records review included properties immediately adjacent to the Site, and other properties (as identified by aerial photographs, etc.) where the potential for environmental contamination to impact the Site was apparent (i.e. petroleum product storage in the immediate area). Records included a search for previous environmental reports, historical aerial photographs, city directories, fire insurance maps, Federal and Provincial Agency review, LNIB records, and Regional District records. A reference of personal communications is included in the references section of this report.

3.2 INTERVIEWS

Interviews with persons knowledgeable about the Site were carried out to obtain or confirm information on the environmental characteristics of the property and historical use. Information provided by interviewees is detailed in Section 5, and included throughout the report. Dwight Shanner and Carmen Marshall from Columbia Environmental conducted the interviews on September 14, 2010.

3.3 SITE VISIT

The Site visit was conducted by Summer Zawacky, B.Sc., and Carmen Marshall, B.Sc., from Columbia Environmental and Harold Joe from LNIB on September 27th 2010. A Site inventory was completed and the subject property was examined for evidence of actual or potential environmental contamination. All areas of the reserve and structures were accessible during the Site visit, and GPS coordinates were taken at each point of interest using a hand held Garmin GPS Map 60Cx as UTMs in the NAD 83 datum. Physical limitations were not observed during the Site visit, and all locations were accessible to Columbia personnel.

4.0 HISTORICAL RECORDS REVIEW

4.1 RECORDS REVIEW

An outline of the history of land use on the subject property and adjacent properties was compiled though the review of the variety of information sources. These typically include historical records and a review of files retained by regulatory agencies, however, the following standard sources of information were not available:

- Fire insurance drawings;
- City/Business directories; and
- Historical Title search.

For the historical uses of the property, aerial photographs dating back to 1947, interviews, web searches, archives, and previous reports supplied by INAC and the provided important information. A list of sources and references for the records review is provided in Section 11. The BC online Site Registry search results are found in Appendix B. Correspondence can be found in Appendix C and examples of historical aerial photographs can be found in Appendix D. A list of Species At Risk potentially in the Site area can be found in the CDC Search Results provided in Appendix E. Previous reports identified are found in Appendix G.

4.1.1 REVIEW OF AERIAL PHOTOGRAPHS

Aerial photographs dated 1947, 1966, 1969, and 1986 from the University of British Columbia's Geographic Information Centre (UBC GIC) were reviewed for information about land use at the subject property and adjacent lands. Copies of representative aerial photographs are included in Appendix D. Site details from the aerial photograph interpretation is briefly described below in the following table:

Table B. Air Photo Review Summary

Aerial photo Year	Description
1947	***Subject Property:*** The topography slopes to the south. Guchion Creek and Highway 97C run parallel through Pipseul IR. No development noted on the Pipseul IR.
	Adjacent Lands: Adjacent lands are undeveloped.
1966	***Subject Property:*** A gas pipeline right of way has been cleared and is parallel to Hwy 97C.
	Adjacent Lands: Cleared vegetation is visible to the east for a power line. The remaining adjacent properties are undeveloped.
1969	***Subject Property:*** Area shows no visible changes. The wetland connected to Guichon Creek is more visible in this photo.
	Adjacent Lands: No changes noted.
1986	***Subject Property:*** Cleared vegetation in the north section of the reserve. An access road from Hwy 97C to the Site is notable. Located of former concrete plant.
	Adjacent Lands*:* To the south a logging road with two cut blocks are present. To the north- an area of clear vegetation and access road is present with a settling pond in the center of the Site.

4.1.2 CITY DIRECTORIES

The Merritt Public Library was contacted in regards to any business directories. They did not have records of City/Business directories for the reserve.

4.1.3 FIRE INSURANCE MAPS

The Merritt Fire Department and Lower Nicola Fire Department was contacted regarding any historical information. No records pertaining to Pipseul IR #3 were identified.

4.1.4 HISTORICAL TITLE SEARCH

A historical title search was not considered relevant for this project, as the subject property has remained in the authority of the federal government since its inception as a reserve. Two CP lots are present on the reserve.

4.2 AGENCY REVIEW

Columbia contacted federal, provincial, regional, and municipal agencies to identify actual or potential environmental contamination issues on or near the subject Site. The following

sections of the report present the findings of the regulatory review conducted for the subject property.

4.2.1 LOWER NICOLA INDIAN BAND

LNIB maintains a file with the original surveys of the lot boundaries and utilities serviced to each lot. Records of surveys were requested through the housing department. No reply from the housing department at this time.

4.2.2 FEDERAL GOVERNMENT

The INAC Environmental Management System database, IEMS (formerly ESSIMS), had no records or reports for the reserve.

The Treasury Board of Canada Contaminated Sites Action Plan Site registry did not have any registered Sites within its database for the reserve.

4.2.3 BC MINISTRY OF ENVIRONMENT – SITE REGISTRY

The contaminated Sites provisions under the *Environmental Management Act* (Formerly the *Waste Management Act*) and *Contaminated Sites Regulations*, effective April 1997,require the Province to provide public information about Site investigations and cleanups. The Site Registry has been established to meet this requirement. The Site Registry documents milestones in the Site assessment process and provides public access to this information. It contains information regarding which Sites have been investigated and/or remediated since MoE began recording this activity. The Site Registry is not a registry of only contaminated Sites; it also includes Sites for which a Site Profile has been submitted.

The online version of the Site Registry database searches for records of Sites within a 1.0 kilometer radius of the subject property. The Site Registry has been collecting data only since its inception in April 1997, and not all Sites of known or potential contamination within the search area may have been captured. Therefore, the searches cannot be considered a definitive method of identifying all Sites of potential contamination within the search area. The Site Registry search results are presented in Appendix B and are summarized below:

Subject Property
No records were identified in the Site Registry for the subject property.

Adjacent Properties
According to the BC Online search there were no records in the Site Registry for the adjacent properties when a 1 km radius search was completed using the center of the reserve as the search center.

4.2.4 CITY OF MERRITT

Sean O'Flaherty of the City of Merritt was contacted requesting any information regarding environmental or contamination issues or building permits for the lands of LNIB. The City

has no records regarding the subject property and adjacent lands, and do not maintain any such records for facilities operating on Reserve Lands.

4.2.5 MERRITT MUSEUM & ARCHIVES

The Museum of Merritt was contacted by telephone for historical records. The Museum completed a search for the LNIB reserve lands and did not identify any records for Pipseul IR #3.

4.2.6 THOMPSON NICOLA REGIONAL DISTRICT

Peter Hughs of the environmental department with the Thompson Nicola Regional District (TNRD) was contacted requesting any information regarding environmental issues on or near LNIB reserves. Mr Hughs stated that the district has no records regarding the subject property and do not maintain any records for facilities operating on reserve lands.

4.2.7 TERASEN (FORMERLY BC GAS)

Toni Melliere of Terasen Gas was contacted regarding service connections to the subject property including any current or historical issues that are likely to have resulted in environmental impacts on the Reserve. Terasen has no record of environmental issues that may have occurred on the subject property or adjacent properties. Terasen does not keep records pertained to the service initiation and decommission as the companies standard policy.

4.2.8 FORTIS BC (FORMERLY BC HYDRO)

Louise Ouelett of Transmission Distribution and Environment at Fortis BC was contacted regarding the presence of service connections to the subject property including any current or historical issues that are likely to have resulted in environmental impacts on the reserve. Fortis has no record of environmental issues or transformer locations (possibly containing PCBs) that may have occurred on the subject property or adjacent properties.

4.3 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

In 1999, Klohn-Crippen Consultants Ltd (Kolhn-Crippen) completed a Phase I and II ESA for Mammet IR# 1, Joeyaska IR# 2, Pipseul IR # 3, Zoht IR #4 and Speous IR #8 on behalf of First Nations Emergency Services Society of BC (FNESS). The report focused on the assessment, removal and replacement of fuel storage tanks. Pipseul IR #3 was found to have one residence with an AST of 1365 liters in good condition. The report identified an oil burning furnace used the heating oil stored in the AST.

4.4 INTERVIEWS

Interviewees included: Marvin Shuter, Willie Basil, Francis Shuter, Delia Shuter, Ira Sterling, Maggie Shuter Harold Joe, Don Moses, Gloria Moses. Interviews with LNIB members identified no issues of concerns.

Table C. Summary of Information Obtained from Interviewees

Area of Concern	Location	Description
Pipseul # 3	20 km north of IR#1 on Hwy 97C	No LNIB concerns. Former concrete batch plant and gravel pit. Estimated date of operation is 35 years ago, under the name Nicola Valley Sand and Gravel (a LNIB company.

5.0 SITE DESCRIPTION

5.1 GENERAL PROPERTY DESCRIPTION

The Lower Nicola Indian Band is comprised of ten reserves that total 17,500 acres. Nine reserves are located within the Merritt area and the most northern parcel (Hihium IR #6) is located approximately 65 km north of the city of Kamloops B.C. Pipseul IR#3 is square in shape and is 220 acres in size, located northwest of Merritt. Coordinates for Pipseul IR#3 are zone 10 654938E, 5592863.3N on topographic NTS map sheet 092P07. A Former Concrete Plant, is located on the northern portion of the Reserve, with the remaining surrounding reserve lands consisting of cattle pasture and undeveloped lands. The Mamit Lake Road (Highway 97C) right of way and a gas pipeline right of way go through the north east corner of the reserve. Guichon Creek flows south through the center of the Site and there are no current developments.

5.1.1 SITE DETAILS

Bases on the information identified in the interviews and historical review, the only development noted onSite is the Former Concrete Plant. The cattle pasture consists of some fencing and a barn that were not of concern to the LNIB or the Assessor.

The table on the follow pages summarizes the major features of the former and current land uses of each area, and any other relevant information that pertains to this study.

Table D. Site Area Summary

Area ID (UTM Zone 10)	Potential Environmental Concerns	Structures Present	Historical Land Use	Current Land Use
Former Concrete Plant 654938E 5592863N	• Concrete pads/ blocks, creosote treated wood waste, welded metal beams (4m x 6m), 2 metal ladders, rubber tires, stove and dryer, conveyor belts, large iron plates, metal gasket, 2 empty 205L drum, empty oil containers, paint pails, dimensional wood waste, and limited tarred asphalt roofing material • 1.5 deep open sump (0.6m of full of water) • Collapsed Metal Silo and filter	• Collapsed Outhouse • Concrete Pads	Industrial	Abandoned buildings and Wild lands

5.1.2 STRUCTURES INVENTORY

Two structures, a sump, several concrete pads, and limited scattered debris were noted throughout the area visited during the Phase I ESA. As the focus of this investigation was on previously identified Sites, ASTs, waste materials and potential contamination sources, residences and municipal structures were not within the scope of work and are not included in the structures inventory. A summary of the structures observed at the Site visited is detailed in the table below.

Table E. Summary of Structures On-Site

Area ID	Structure Name	Description/Contents
Concrete Plant	Collapsed Outhouse (1m x 1m)	• Untreated wood frame and roof
	Collapsed Silo (3.5m x 6m)	• Collapsed metal silo with concrete pedestal and filter
	Concrete Sump (3m x 1.5m)	• Open concrete lined sump is 1.5m deep with standing water (0.6m deep)

5.2 TOPOGRAPHY

The Site is situated in the relatively flat floodplain of Guichon Creek at approximately 1000m above sea level. Elevation is higher on the eastern and western edges of the Site, and decreases down towards Guichon Creek and Mamit Lake Road. Relief on the property ranges from Guichon Creek (975 m) in the center of the Site to 1000m on the east and western portions of the Site. The flooplain of Guichon Creek slopes gently down to the South. A smaller unnamed seasonal drainage flows from the east south along the eastern portion of the Site, and drains into Guichon Creek.

5.3 GEOLOGY

The local geology within the Pipseul IR#3 is comprised of the Quesnel Terrane within the intermontane belt. The reserve is located on three formations, the Nicola Group – Western Volcanic Facies, Nicola Group, and Guichon Creek Batholith. The formations consist of mafic to felsi pyriclastic rocks and flows, argillite, sandstone, local carbonates, granodiorite trending to quartz monzonite, and undifferentiated volcanic rocks including augite-phyric flows, tuufs and breccias, and greywacke. The volcanic rocks dominating the Site are covered with a surficial "Till Blanket" of varying thickness primarily made up of unconsolidated compositions of silts, sands, gravels, and cobbles. Soil types at the Site a grey luvisols, typical of grassland forest transition zones ((Ministry of Energy, Mines, & Resources, 2011).

5.4 SURFACE DRAINAGE

Surface drainage at the Site is anticipated to be primarily infiltration into the underlying soils. Guichon Creek flows south through the Site towards the Mamit Lake and the Nicola River. To the west of the creek is a slope in where run off would flow southwest towards Guichon Creek. Wetlands are located on Site adjacent to Guichon Creek and increase in area as seasonal flow increases.

5.5 CLIMATE DATA

The tables below provide climate values and monthly precipitation values as collected at Merritt B.C. Metrological Station, based on data from 1971 to 2000[1]. The average annual precipitation is 322.2 mm.

Table F. Climate Values for 1971-2000

Meteorological Station Elevation:	609.0m
Daily Mean Temperature:	7.4ºC
Annual Rainfall:	238.9mm
Annual Precipitation:	322.2mm
Highest Monthly Average Precipitation:	Dec, 39.6mm
Lowest Monthly Average Precipitation:	April, 14.5mm

[1] www.climate.weatheroffice.ec.gc.ca

Table G. Precipitation Values for 1971-2000

Month	Average Precipitation (mm)	Month	Average Precipitation (mm)	Month	Average Precipitation (mm)
January	37.2	May	26.8	September	23.6
February	23.6	June	34.1	October	23.5
March	16.6	July	25.8	November	34.7
April	14.5	August	22.1	December	36.9

5.6 UTILITIES

No residential properties are located onSite. No utilities such as septic services, underground water and overhead electrical power were reported at the Site.

5.7 ADJACENT PROPERTIES

Adjacent to the east edge of the reserve is Mamit Lake Road (Highway 97C) and overhead powerlines. A gas pipeline runs down the eastern edge of the reserve, and crosses through the Site in the northeast corner. Highway 97C right of way also goes through the property in the northeast corner. To the northwest is a road with two square features that appear to be a pond or reservoir are present. Cut blocks and logging roads are present in the adjacent lands to the south, west and north.

A gas pipeline right of way through the reserve has been in operation since 1956 by Spectra Energy. The two gas pipelines were installed 30’ (1956) and 36’(1971) diameter and transports natural gas. Spectra Energy in BC, has about 1,800 miles of natural gas transmission pipeline which can transport 2.2 billion cubic feet of natural gas per day utilizing 19 compressor stations and 4 interconnecting pipelines. The transmission system is fully regulated by Canada’s National Energy Board, and the southern mainline has served markets in British Columbia’s lower mainland and the US Pacific Northwest. Joanne Metz identified that no spills or leaks have been reported in the ROW adjacent to the Site according to Spectra Energy.

5.8 VALUED ECOSYSTEM COMPONENTS (VECs)

The Site is located on the floodplain of Guichon Creek, in Bunchgrass and Interior Douglas Fir (IDF) biogeoclimatic zones north of Mammet Lake. Representative trees in this ecosystem include Douglas fir, trembling aspen, lodgepole pine, ponderosa pine, hybrid spruce, Rocky Mountain juniper. Shrubs for the area include species such as snowberry, common juniper, Saskatoon, Kinnikinnik, red osier dogwood, black gooseberry, prickly rose and false box. Herbs common to the area include bluebunch wheatgrass, pinegrass, wheatflower, bunchberry, yarrow, sedges (spp) and spike rushes to name a few (Ministry of Forests 1991).

A list of species from the BC Conservation Data Center (CDC) search, indicating species found within the area has been included in Appendix E. Characteristic wildlife in the region (CDC) include, but is not limited to, moose, mule deer, black bear, cougar, elk, grizzly, eagle, big horn sheep, badger, coyote, wolf, marmot, raven, spruce grouse, and various waterfowl.

A number of potential species on Site are considered Species at Risk by COSEWIC[2] and receive special protection for critical habitats. Provincially, red listed (being considered for designation as threatened or endangered) or blue listed (considered vulnerable) species, by the BC Ministry of the Environment, means that they require special management attention. The semi-pristine natural lands within the area of the Site are favorable Species at Risk Act (SARA) listed species habitat. A biological inventory would be required to further investigate the potential presence of Species at Risk.

5.9 WATER WELLS

The BC MoE water well database[3] was searched in a 1 km radius from the Site. One (1) well was located 130m west of Mamit Lake Road, in the central portion of the Reserve. Well use is labeled private/domestic, and is down gradient and across Guichon Creek from the Concrete Plant. Well details are summarized in the table below:

Table H. Water Well Search Results

Well Tag Number	Well Depth (m)	Drill Date	Direction to Site	Distance from Site	Owner	Major Geology Encountered (m)
51644	31.4	January 1983	SE of Concrete Plant and 130m West of Mamit Lake Road	675m	Gloria Moses	0-6.1 Sand & Gravel 6.1-12.2 Sand 12.2-18.3 Sand Silt 18.3-28.9 Silt 28.9-30.5 Gravel & Water 30.5-31.4 Clay, Silt

5.10 HISTORICAL LAND USE

Pipseul IR #3 has historically been utilized for industrial occupation and wild lands. Hunting, fishing and gathering were and are traditional uses of the Reserve lands.

5.11 REGULATORY HISTORY

One previous report has been found for the Site, the details are specified in section 4.3 above.

[2] COSEWIC means the Committee on the Status of Endangered Wildlife in Canada

[3] Ministry of Environment. 2010. Water Resource Atlas Web Mapping Application http://www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html

6.0 FINDINGS

6.1 FUEL / CHEMICAL HANDLING AND STORAGE

No evidence of current or former underground storage tanks (USTs) was identified during this assessment. One former above ground storage tank (AST) was identified in a Phase I and II UST Removal and Replacement Program report (Kolhn-Crippen, 1999). No record of this AST was reported during the interviews, and the AST was not identified during the field visit.

Two empty 205L drums were observed at the Former Concrete Plant with occasional 20L and 1L containers formerly containing petroleum products and/or paint were noted within the debris areas at the former concrete plant. A summary of the hazardous substances has been provided below in Table H.

6.2 SOLID WASTE MATERIALS

Currently no solid waste is generated on the Site. Previously generated waste remains on the Site at the concrete plant. Details of the debris areas and wastes remaining at the former concrete plant are shown on Figure 2, and summarized in Table H below. Representative photographs have been included in Appendix F.

Table I. Summary of Solid Waste

Site ID (Location)	Area Details	Content Description
Former Concrete Plant	• Hydrocarbon Containers & Dimensional Wood Waste	• 5m diameter pile of dimensional wood waste with nails 2 large rubber tires, occasional aerosol cans, electrical conduit, and tarred roofing material. • 2m diameter area of empty petroleum hydrocarbon and paint containers (20L and 1L containers and 1 empty 205L drum)
	• Poured Waste Concrete & Metal Debris	• 6m diameter area of poured waste concrete • 8m x 3m area containing 4 metal conveyors, large iron plate, metal gasket, ladder, and 1 empty 205L drum.
	• Occasional Scattered Metals	• One stove, and occasional scattered metals were noted throughout the Site.

6.3 SPILLS AND STAIN AREAS

No surface stains were identified by those interviewed or noted during the Site visit.

6.4 WASTEWATER DISCHARGE

No concerns with regard to wastewater discharge were identified. One sump was noted within the former gravel pit area. There was no indication as to its former use and the sump had an open top that contained only a small amount of water. The sump represents a physical hazard.

6.5 AIR DISCHARGES

No concerns with regard to air quality discharge were identified.

6.6 POLYCHLORINATED BIPHENYLS (PCB)

There were no records of PCB containing transformers or capacitors on the Site. No environmental concerns regarding PCBs were determined during this investigation.

6.7 ASBESTOS

The use of friable asbestos as a building material was banned in the U.S. in the mid 1970s. The manufacturing of building materials containing asbestos was generally phased out in North America by the mid 1980s. Given that cement products are onsite, there is the potential for asbestos to be present at the Site. Information from interviews noted a batch plant was on site approximately thirty-five years ago. This indicated the plant was in operation at the cusp of the asbestos phase out, therefore the minimal potential of asbestos exists onsite.

The presence of asbestos has not been confirmed, but it is possible that asbestos may be present in such materials as insulation, cement products, grouts, plaster, compressed papers and boards, linoleum, floor tiles, duct tapes, sealants and protective coatings. Cement products were noted within the solid wastes at the former concrete plant, otherwise material resembling friable asbestos was not observed during the Site reconnaissance. If demolition or renovation of structures is considered, the identification and safe removal or containment of asbestos is regulated under Section 20.112 of the OHSR. When these materials are in use they are not waste materials; however, following removal it is recommended that they be managed in accordance with the *Hazardous Waste Regulation* and the *Environmental Management Act.*

6.8 HEAVY METALS

There is the potential for localized metals impacts to surface soils due to the presence of miscellaneous metal debris and other wastes. A discussion of the potential sources of metals impacts has been included in the solid waste inventory above.

6.9 OZONE DEPLETING SUBSTANCES (ODS)

No environmental concerns relative to ODS were identified.

6.10 NOISE

No environmental issues concerning noise were identified during this investigation.

7.0 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The Former Concrete Plant identified during the Site visit is an APEC and its associated contaminants of potential concern (COPC) are provided below.

Table J. Areas of Potential Environmental Concern (APECs)

APEC	Description of Contamination or Risk	COPC
APEC 1 Former Concrete Plant UTM 10.654938.5592863	The Former Concrete plant contains a scattered waste including metals, concrete, discarded hydrocarbon containers, and building materials. Debris is located between the hillside and Guichon Creek. Gravel extraction was identified for site operations in addition to the former batch plant.	• Metals • PAH • PHC • VOC • Asbestos
Offsite APEC 2 Gas pipeline R/W 10.654938.5592863	Two gas pipelines have been installed one in 1956 and another in 1971. Equipment for maintenance may have leaks and gas leaks have the potential for explosions.	• Metals • PHC

PAH = Polycyclic Aromatic Hydrocarbons
VOC = Volatile Organic Compounds
PHC = Petroleum Hydrocarbons including F1, F2, F3 and F4 fractions, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

8.0 RECOMMENDATIONS

A Phase 2 ESA is recommended to determine the presence or absence of contaminated media at APEC 1 identified by this assessment.

9.0 REPORT USE AND LIMITATIONS

This Phase I ESA report has been prepared for the exclusive use of Indian and Northern Affairs Canada (INAC), and it is intended to provide INAC with an understanding of the potential for environmental contamination by hazardous materials at the property assessed. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user. The findings and recommendations in this report are based upon data and information obtained during Site visits by Columbia and INAC personnel to the Site identified herein and the condition of the Site on the dates of such visits, supplemented by information and data obtained by Columbia described herein.

The findings and recommendations contained in this report are based on the expertise and experience of Columbia in conducting similar Site assessments. In assessing the Site, Columbia has also relied upon representations and information furnished by individuals noted in the report with respect to existing operations and property conditions and the historical uses of the properties to the extent that the information obtained has not been contradicted by data obtained from other sources. Accordingly, Columbia accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations or fraudulent information provided by others.

It should be recognized that this study was not intended to be a definitive investigation of contamination at the Site. Given that the limited scope of services for this assessment as stated in the Terms of Reference for the Phase I ESA, it is possible that currently unrecognized contamination may exist at the Site and, if present, that the levels of contamination may vary across the Site. Opinions and recommendations presented herein apply to Site conditions existing at the time of our assessment and those reasonably foreseeable. Should environmentally significant changes to the Site or additional information become available, Columbia should be provided the opportunity to review this information/data and amend our opinions, as appropriate. Fungi, mycotoxins, bioaerosols and other indoor air quality issues were not included in the scope of work.

Columbia's objective is to perform our work with care, exercising the customary thoroughness and competence of earth science, environmental, and engineering consulting professionals, in accordance with the standard for professional services at the time and location those services are rendered. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liability on a particular Site. Therefore, Columbia cannot act as insurers and cannot "certify" or "underwrite" that a Site is free of environmental contamination, and no expressed or implied representation or warranty is included or intended in our reports, except that our work was performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

10.0 PROFESSIONAL STATEMENT

The information compiled for this document has been prepared in accordance with the requirements of the INAC Scope of Work.

Columbia certifies that the persons signing this document have demonstrable experience in the assessment of commercial and industrial Sites. The work has been performed by Columbia staff under the guidance and supervision of the signatories below.

Report prepared by:

COLUMBIA ENVIRONMENTAL CONSULTING LTD.

_____	_____
Summer Zawacky, B.Sc.	Carmen Marshall, B.Sc.
Field Supervisor	Field Assessor
_____	_____
Dave Diplock, P.Eng.	Dwight Shanner, R.P.Bio.
Senior Environmental Engineer	Project Manager

11.0 REFERENCES

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Personal Communications

Bob Alexanruck. Division Manager. Ministry of Transportation. Merritt B.C. Regarding Diesel spill and gravel pit on Highway 5.

Joanne Metz. Spectra Energy. Kamloops B.C. Requesting details on the natural gas pipeline.

Louise Ouelett. Environmental and Transmission and Distribution Department. Fortis BC. Vancouver B.C.Regarding records and locations of transformers and service dates.

Peter Hughs. Director of Environmental Services. Thompson Nicola Regional District. Regarding Environmental Records.

Sean O'Flaherty. Development Services Officer. City of Merritt. Merritt B.C. Regarding building permits on reserve or environmental issues.

Toni Melliere. Environmental Division. Terasen Gas. Vancouver B.C. Requesting Environmental records and service dates for LNIB.

Steve Henderson and Joanne Metz. Spectra Energy. Vancouver and Savona, BC.

APPENDIX A

FIGURES

LEGEND

- RESERVE FOOTPRINT
- RESERVE LOT BOUNDARY

NOTES:

Airphoto taken from Google Earth, December 2010

No.	Revision/Issue	Date

COLUMBIA ENVIRONMENTAL

Figure 1
Site Location

LNIB / INAC
Phase I
Environmental Site Assessment
Pipseul IR #3

Project	10-0374	Sheet
Date	January, 2011	
Drawn By: SZ	Checked By: DS/DD	

LEGEND

- SURFACE DEBRIS
- SUMP
- SURFACE WATER
- CONCRETE FOUNDATIONS
- WOOD WASTE
- FENCE
- GRAVEL ROAD
- RESERVE BOUNDARY
- SURFACE / GROUNDWATER FLOW DIRECTION

NOTES:

All elevations in metres (m)

Locations of site features were taken from:
1. Aerial photographs
2. GPS data points, and
3. Visual observations / adjustments of GPS waypoints and site features

No.	Revision/Issue	Date

COLUMBIA ENVIRONMENTAL

Figure 2
Pipseul IR#3
Concrete Plant

LNIB / INAC
Phase I
Environmental Site Assessment
Pipseul IR #3

Project		Sheet
10-0374		
Date: January, 2010		
Drawn By: SZ	Checked By: DS, DD	

APPENDIX B

BC ONLINE SITE REGISTRY RESULTS

Pipsue

Site Registry

Nil Search

For: [PA95213] [COLUMBIA ENVIRONMENTAL CONSULTING LTD]

Jan 04, 2011

As Of: JAN 02, 2011

Check for Prints

04:33:43 PM

Main Menu | Return | Print | Help ?

Folio:

Area Nil Search

As of JAN 02, 2011, no records from Site Registry
fall within 0.5 kilometers of coordinates
Latitude 50 degrees, 28 minutes, 02.8 seconds, and
Longitude 120 degrees, 49 minutes, 00 seconds.

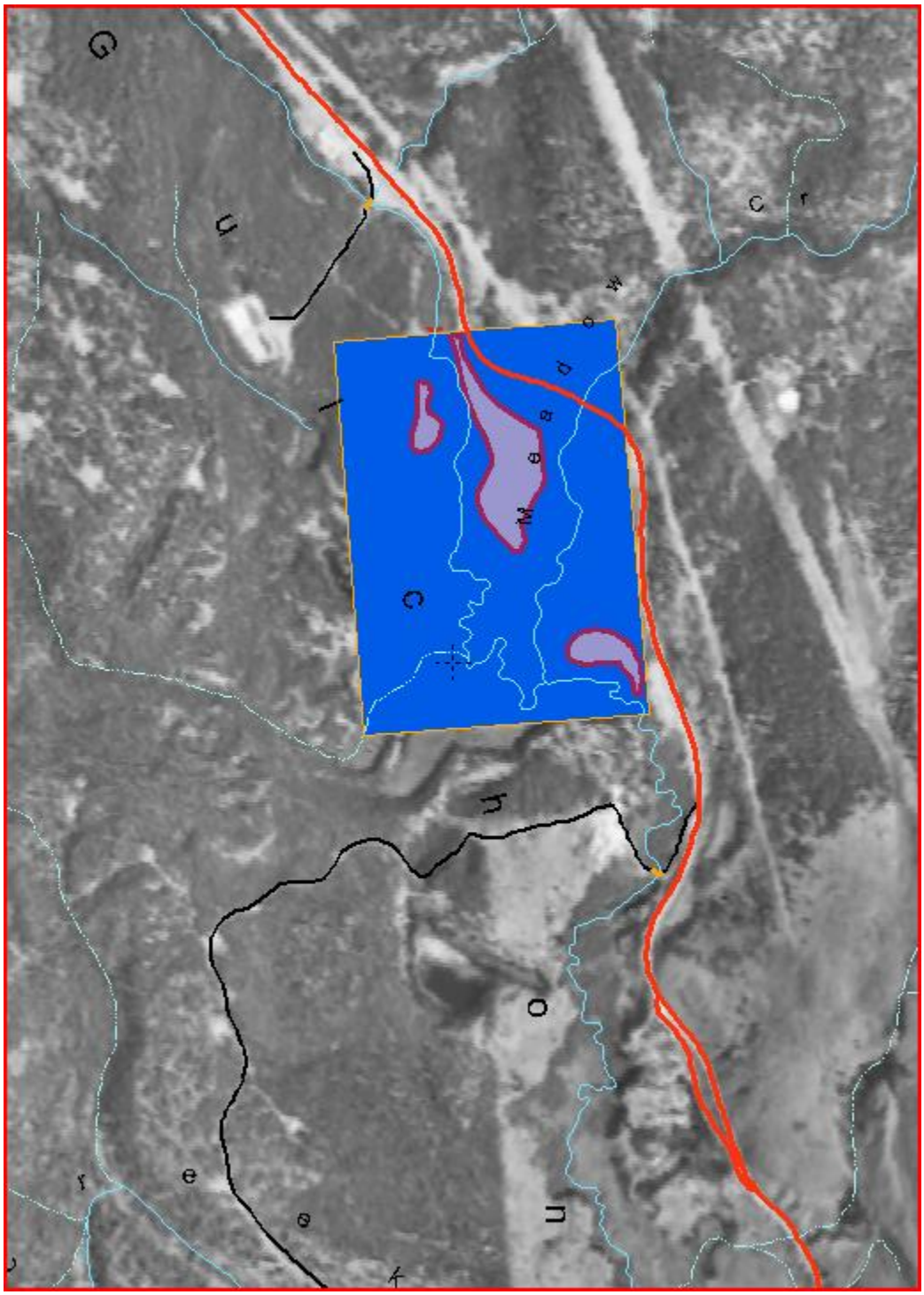
You have been charged for this information.

Sites may be revealed by searching with alternate search methods. For example, a site not revealed in an Area search may be revealed by searching with another piece of information such as PID, PIN, Address or Crown Lands File Number.

APPENDIX C

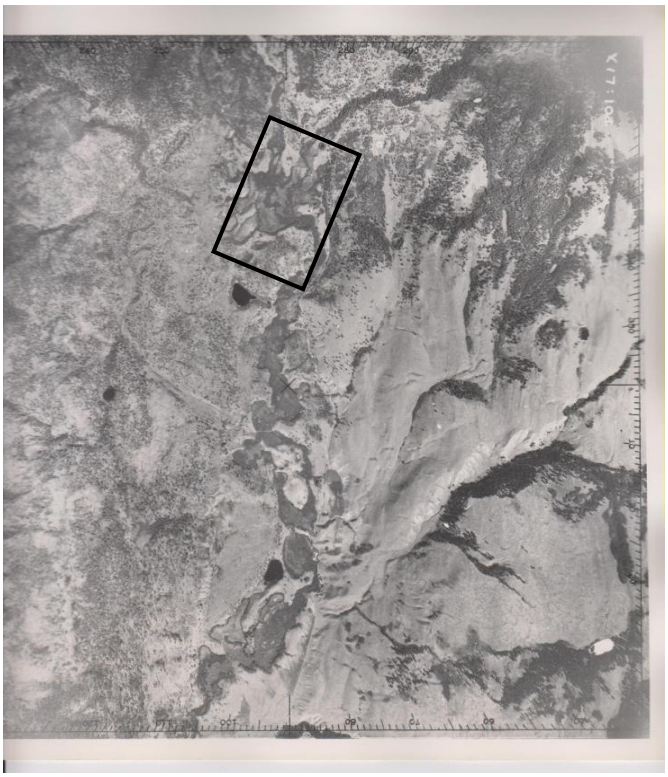
CORRESPONDENCE

Pipseul IR# 3 (Center 654938.69 5592800.64) 5 archaeological sites (two just outside the boundary to the north, 3 inside IR boundary), no data for AOA potential:

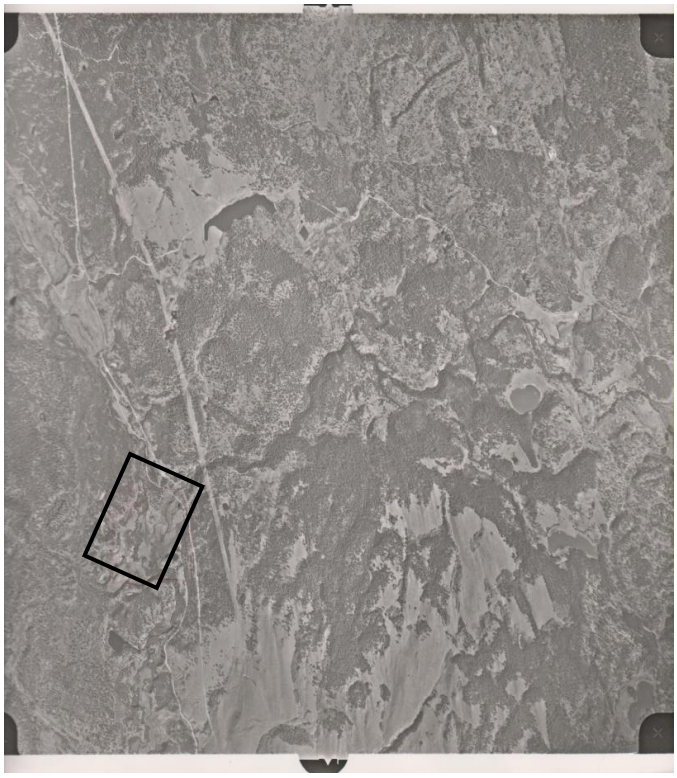


APPENDIX D

AERIAL PHOTOGRAPHS

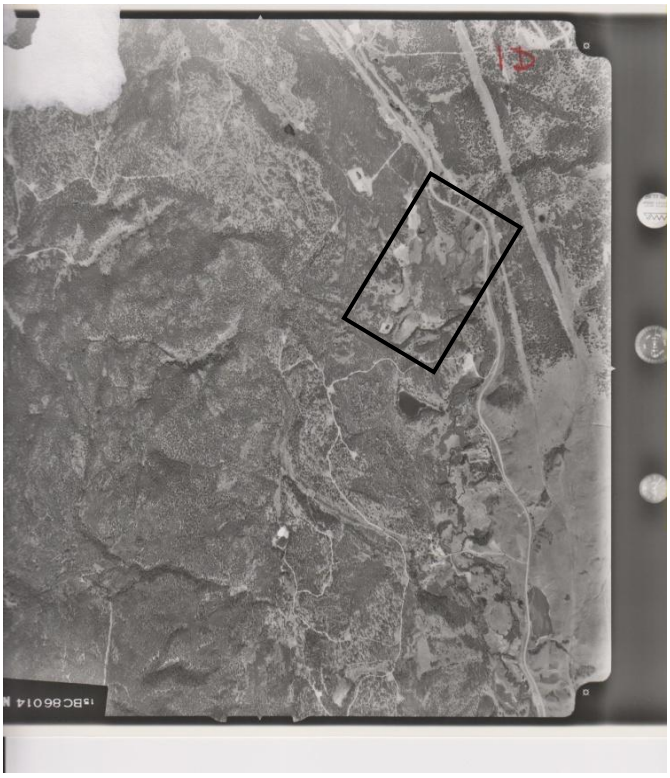


Photograph 1. 1947 Aerial Photograph BC 378-94



Photograph 3. 1966 Aerial Photograph BC 5186-102

Photograph 4. 1969 Aerial Photograph RSA30518-19



Photograph 5. 1986 Aerial Photograph 15 BC86014_093

APPENDIX E

CDC SEARCH RESULTS

Table B: BC CDC Search Results for Species within the Bunchgrass Ecosystem (CDC, 2010)[1]

Scientific Name	English Name	COSEWIC*	BC List**
Amphibians			
Spea intermontana	Great Basin Spadefoot	T (Apr 2007)	Blue
Chrysemys picta pop. 2	Western Painted Turtle - Intermountain - Rocky Mountain Population	SC (Apr 2006)	Blue
Fish			
Acrocheilus alutaceus	Chiselmouth	NAR (May 2003)	Blue
Catostomus platyrhynchus	Mountain Sucker	NAR (May 1991)	Blue
Salvelinus confluentus	Bull Trout		Blue
Reptiles			
Coluber constrictor	Racer	SC (Nov 2004)	Blue
Pituophis catenifer deserticola	Gopher Snake, *deserticola* subspecies	T (May 2002)	Blue
Crotalus oreganus	Western Rattlesnake	T (May 2004)	Blue
Birds			
Ardea herodias herodias	Great Blue Heron, *herodias* subspecies		Blue
Buteo swainsoni	Swainson's Hawk		Red
Falco mexicanus	Prairie Falcon	NAR (May 1996)	Red
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	SC (Apr 2007)	Red
Grus canadensis	Sandhill Crane	NAR (May 1979)	Yellow
Numenius americanus	Long-billed Curlew	SC (Nov 2002)	Blue
Asio flammeus	Short-eared Owl	SC (Mar 2008)	Blue
Athene cunicularia	Burrowing Owl	E (Apr 2006)	Red
Megascops kennicottii macfarlanei	Western Screech-Owl, *macfarlanei* subspecies	E (May 2002)	Red
Otus flammeolus	Flammulated Owl	SC (Apr 2010)	Blue
Melanerpes lewis	Lewis's Woodpecker	T (Apr 2010)	Red
Sphyrapicus thyroideus thyroideus	Williamson's Sapsucker, *thyroideus* subspecies	E (May 2005)	Red

Scientific Name	English Name	COSEWIC*	BC List**
Contopus cooperi	Olive-sided Flycatcher	T (Nov 2007)	Blue
Eremophila alpestris merrilli	Horned Lark, *merrilli* subspecies		Blue
Hirundo rustica	Barn Swallow		Blue
Catherpes mexicanus	Canyon Wren	NAR (May 1992)	Blue
Oreoscoptes montanus	Sage Thrasher	E (Nov 2000)	Red
Chondestes grammacus	Lark Sparrow		Red
Spizella breweri breweri	Brewer's Sparrow, *breweri* subspecies		Red
Dolichonyx oryzivorus	Bobolink	T (Apr 2010)	Blue
Euphagus carolinus	Rusty Blackbird	SC (Apr 2006)	Blue
Mammals			
Perognathus parvus	Great Basin Pocket Mouse		Red
Corynorhinus townsendii	Townsend's Big-eared Bat		Blue
Euderma maculatum	Spotted Bat	SC (May 2004)	Blue
Myotis ciliolabrum	Western Small-footed Myotis		Blue
Myotis thysanodes	Fringed Myotis	DD (May 2004)	Blue
Gulo gulo luscus	Wolverine, *luscus* subspecies	SC (May 2003)	Blue
Martes pennanti	Fisher		Blue
Taxidea taxus	American Badger	E (May 2000)	Red
Ursus arctos	Grizzly Bear	SC (May 2002)	Blue
Ovis canadensis	Bighorn Sheep		Blue
Invertebrates			
Stylurus olivaceus	Olive Clubtail		Red
Hesperia nevada	Nevada Skipper		Blue
Pholisora catullus	Common Sootywing		Blue
Satyrium californica	California Hairstreak		Blue
Danaus plexippus	Monarch	SC (Apr 2010)	Blue
Promenetus umbilicatellus	Umbilicate Sprite		Blue
Vallonia cyclophorella	Silky Vallonia		Blue
Hemphillia camelus	Pale Jumping-slug		Blue
Vascular Plants			
Azolla mexicana	Mexican mosquito fern	T (Nov 2008)	Red

Scientific Name	English Name	COSEWIC*	BC List**
Dryopteris cristata	crested wood fern		Blue
Ophioglossum pusillum	northern adder's-tongue		Blue
Agoseris lackschewitzii	pink agoseris		Blue
Arabis lignifera	woody-branched rockcress		Blue
Arabis sparsiflora	sickle-pod rockcress		Red
Astragalus lentiginosus	freckled milk-vetch		Blue
Atriplex argentea ssp. *argentea*	silvery orache		Red
Atriplex truncata	wedgescale orache		Red
Castilleja cusickii	Cusick's paintbrush		Red
Centaurium exaltatum	western centaury		Red
Chamaerhodos erecta ssp. *nuttallii*	American chamaerhodos		Blue
Chamaesyce serpyllifolia ssp. *serpyllifolia*	thyme-leaved spurge		Blue
Chenopodium atrovirens	dark lamb's-quarters		Red
Crepis atribarba ssp. *atribarba*	slender hawksbeard		Red
Crepis modocensis ssp. *modocensis*	low hawksbeard		Red
Crepis modocensis ssp. *rostrata*	western low hawksbeard		Red
Epilobium halleanum	Hall's willowherb		Blue
Gaura coccinea	scarlet gaura		Red
Gayophytum humile	dwarf groundsmoke		Blue
Hackelia diffusa	spreading stickseed		Blue
Hedeoma hispida	mock-pennyroyal		Red
Hutchinsia procumbens	hutchinsia		Blue
Hypericum scouleri ssp. *nortoniae*	western St. John's-wort		Blue
Iva axillaris	poverty-weed		Red

Scientific Name	English Name	COSEWIC*	BC List**
Leptosiphon septentrionalis	northern linanthus		Blue
Lupinus argenteus var. *laxiflorus*	silvery lupine		Red
Lupinus bingenensis var. *subsaccatus*	Suksdorf's lupine		Red
Mimulus breviflorus	short-flowered monkey-flower		Red
Myriophyllum ussuriense	Ussurian water-milfoil		Blue
Navarretia intertexta	needle-leaved navarretia		Red
Polygonum polygaloides ssp. *kelloggii*	Kellogg's knotweed		Blue
Pyrola elliptica	white wintergreen		Blue
Salix boothii	Booth's willow		Blue
Salix tweedyi	Tweedy's willow		Blue
Sidalcea oregana var. *procera*	Oregon checker-mallow		Red
Sphaeralcea coccinea	scarlet globe-mallow		Red
Allium geyeri var. *tenerum*	Geyer's onion		Blue
Carex hystericina	porcupine sedge		Blue
Carex sychnocephala	many-headed sedge		Blue
Cyperus squarrosus	awned cyperus		Blue
Epipactis gigantea	giant helleborine	SC (May 1998)	Blue
Hesperostipa spartea	porcupinegrass		Red
Juncus confusus	Colorado rush		Red
Melica spectabilis	purple oniongrass		Blue
Olsynium douglasii var. *inflatum*	satinflower		Red
Poa fendleriana ssp. *fendleriana*	mutton grass		Red
Sphenopholis obtusata	prairie wedgegrass		Red
Sporobolus compositus var. *compositus*	rough dropseed		Blue

Scientific Name	English Name	COSEWIC*	BC List**
Stuckenia vaginata	sheathing pondweed		Blue
Non Vascular Plants			
Bryoerythrophyllum columbianum	Columbian carpet moss	SC (May 2004)	Blue
Microbryum vlassovii	nugget moss	E (Nov 2006)	Red
Pterygoneurum kozlovii	alkaline wing-nerved moss	T (Nov 2004)	Red

* SC=Special Concern; T=Threatened; E=Endangered; XT=extirpated

** Blue= of special concern, Red= extirpated, endangered or threatened in British Columbia

APPENDIX F

PHOTOGRAPHIC DOCUMENTATION

Photo 1. Overview of Pipseul IR #3 facing southwest, note the large silo and pedestal utilized in the former concrete plant.

Photo 2. View of the concrete slabs and silo facing northwest.

Photo 3. View of scattered metal, concrete and wood waste facing south.

Photo 4. View of debris pile containing wood waste, tires, and petroleum hydrocarbon containers. The debris pile is located southwest of the silo.

Photo 5. View of a sump located 30 meters west of the silo. The sump contained less than a meter of water with no detected odor or sheen.

Photo 6. View facing south of remaining concrete pads and four conveyors with scattered metal debris.

Photo 7. View of concrete posts and machine pieces. Guichon Creek and a wetland is located within the reserve boundary east of the debris piles.

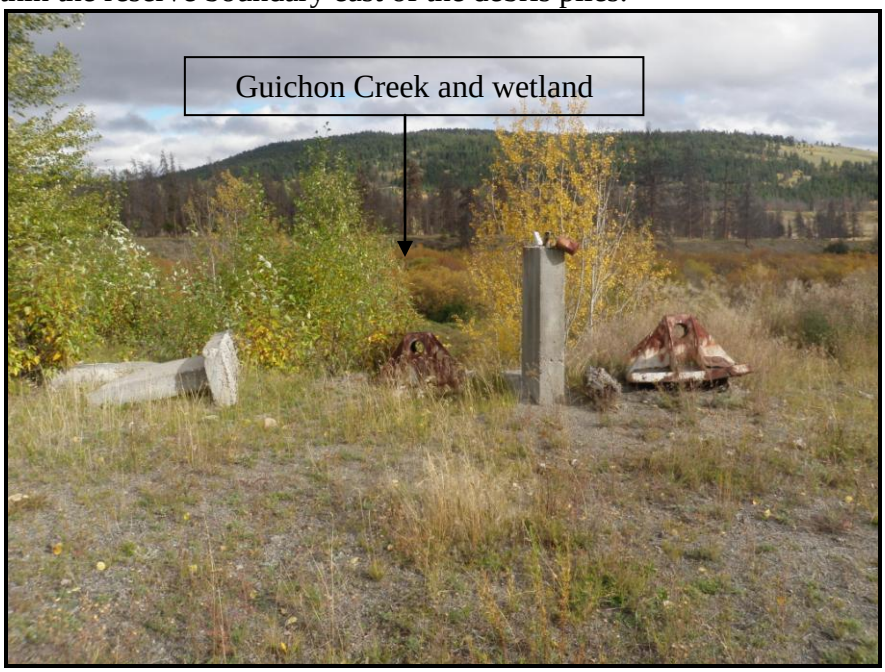


Photo 8. View of a buried concrete and a hot water tank located near the bank of Guichon Creek.

APPENDIX G

PREVIOUS REPORTS

Table G. Water Well Search Results

Well Tag Number	Well Depth (m)	Drill Date	Direction to Site	Distance from Site	Owner	Major Geology Encountered (m)
51644	31.4	January 1983	SE of Concrete Plant and 130m West of Mamit Lake Road	675m	Gloria Moses	0-6.1 Sand & Gravel 6.1-12.2 Sand 12.2-18.3 Sand Silt 18.3-28.9 Silt 28.9-30.5 Gravel & Water 30.5-31.4 Clay, Silt

5.10 HISTORICAL LAND USE

Pipseul IR #3 has historically been utilized for industrial occupation and wild lands. Hunting, fishing and gathering were and are traditional uses of the Reserve lands.

5.11 REGULATORY HISTORY

One previous report has been found for the Site, the details are specified in section 4.3 above.

6.0 FINDINGS

6.1 FUEL / CHEMICAL HANDLING AND STORAGE

No evidence of current or former underground storage tanks (USTs) was identified during this assessment. One former above ground storage tank (AST) was identified in a Phase I and II UST Removal and Replacement Program report (Kolhn-Crippen, 1999). No record of this AST was reported during the interviews, and the AST was not identified during the field visit.

Two empty 205L drums were observed at the Former Concrete Plant with occasional 20L and 1L containers formerly containing petroleum products and/or paint were noted within the debris areas at the former concrete plant. A summary of the hazardous substances has been provided below in Table H.

6.2 SOLID WASTE MATERIALS

Currently no solid waste is generated on the Site. Previously generated waste remains on the Site at the concrete plant. Details of the debris areas and wastes remaining at the former concrete plant are shown on Figure 2, and summarized in Table H below. Representative photographs have been included in Appendix F.