

CASE STUDY 1: SCREENING RISK ASSESSMENT LEVEL 1 (SRA1) FOR ABC CANNED FOODS BIG HARBOUR BRITISH COLUMBIA

1 INTRODUCTION

This report presents the findings of a Screening Risk Assessment Level 1 (SRA1) prepared by ABC Environmental at the request of ABC Canned Foods. The subject site is referenced as 123 Big Harbour Road, in the city of Big Harbour, British Columbia (the “Site”). Location and Site plans are included as Figures 1 and 2, respectively.

1.1 Study Objective

The purpose of the SRA1 was to provide an evaluation of the potential for adverse effects to human and ecological receptors by assessing the presence/absence of potential exposure pathways from the contaminant source to receptors through the development of a conceptual model. The assessment was then used to determine the need, if any, for further remediation.

1.2 Scope of Work

The SRA1 was carried out in accordance with methods described by British Columbia Ministry of Water, Lands, and Parks (BCWLAP) SRA1 Guidance (2004).

2 BACKGROUND

2.1 General Site Description

2.1.1 Existing

The Property is located along the Big Harbour Road on the north side of Four Street. The Property has a total area of approximately 1 hectare. Portions of the Site are covered, grass and trees (0.2 hectare), asphalt (0.5 hectare), building (0.3 hectare) (Figure 1 and Figure 2).

The Property is bordered to the west by Smith Canned Foods and Harvey’s, to the east by a parking lot, and to the south by a Jims Furniture Warehouse. It is located in what would be considered a commercial light industrial area of Big Harbour.

The Site is currently used as a warehouse for canned food, prior to delivery to retail food stores. Although trucks are continually coming to and going from the property no maintenance work on the trucks is conducted at the Site, and no trucks are stored at the Site.

A review of Environment Canada climate information for the Big Harbour area revealed the following (EC 1993):

Average daily maximum temperature:	13.9 °C
Average daily minimum temperature:	5.1 °C
Average daily mean temperature:	9.5 °C
Average yearly rainfall:	812.8 mm
Average yearly snowfall:	46.9 cm
Average daily wind speed:	10 km/hr (2.78 m/s)
Most frequent wind direction:	West
Avg. number of days/year with measurable rainfall:	148 days
Avg. number of days/year with measurable snowfall:	11 days
Avg. number of hours of sunshine per year:	2081.9 hours

2.1.2 Future

The owners of the property intend to maintain the current site use into the foreseeable future.

2.2 Summary of Environmental Site Investigations

ABC Environmental was provided with the results of X previous investigations for the Property.

2.2.1 Phase 1

The Phase 1 for the Site indicated that sandblasting was conducted at the Site in the 1950s. No other environmental issues were identified. The Site is located in a commercial industrial area of Big Harbour.

The Property is bordered to the west by Smith Canned Foods and Harvey's, to the east by a parking lot, and to the south by a Jims Furniture Warehouse. It is located in what would be considered a commercial light industrial area of Big Harbour.

The Site is currently used as a warehouse for canned food, prior to delivery to retail food stores. Although trucks are continually coming to and going from the property no maintenance work on the trucks is conducted at the Site, and no trucks are stored at the Site.

There is one groundwater well within 1.5 km of the Site and the nearest aquatic body to the Site is 2.5 km away.

2.2.2 PSI Report ABC Environmental 2003

The report indicated the presence of lead and zinc at the Site that appeared to be associated with sand blast grit. A sample at 2 m was identified as having zinc and lead at concentrations in excess of the applicable regulatory standards for commercial sites

2.2.3 DSI Report ABC Environmental 2003

Seven boreholes were advanced into the vadose zone as part of the DSI investigation for a total of nine boreholes. Three additional monitoring wells also installed as part of the DSI investigation. Lead and zinc were found to be present in soil beneath the asphalt and building (Table 2 and Figure 1) from approximately 1 m to 3 m below ground surface. No chemicals in excess of BC CSR Groundwater Standards were detected in the groundwater. SWEP and TCLP indicate that contamination in soil samples is not leachable.

2.2.4 Contaminants of Concern and List of the Chemicals Exceeding the Standards.

The chemicals listed in the following Table exceeded the criteria. The table presents the concentration range the applicable criteria exceeded.

Chemical	Measured Concentration (range)	Media	Standard/Criteria Exceeded	Standard/Criteria Value
Lead	<5 – 2004	Soil	Commercial	Aquatic Life
Zinc	23 730	Soil	Commercial	Aquatic Life

2.2.5 Chemical Fate and Transport

Although lead and zinc are potentially mobile, contaminant concentrations in groundwater are well below the CSR groundwater standards.

2.3 Receptor Identification

The description of the site surrounding area was used to determine the potential receptors that may be exposed to COPCs at the site

2.3.1 Human receptors

The potential human receptors include:

- Warehouse worker
- Trucker
- Utility Worker

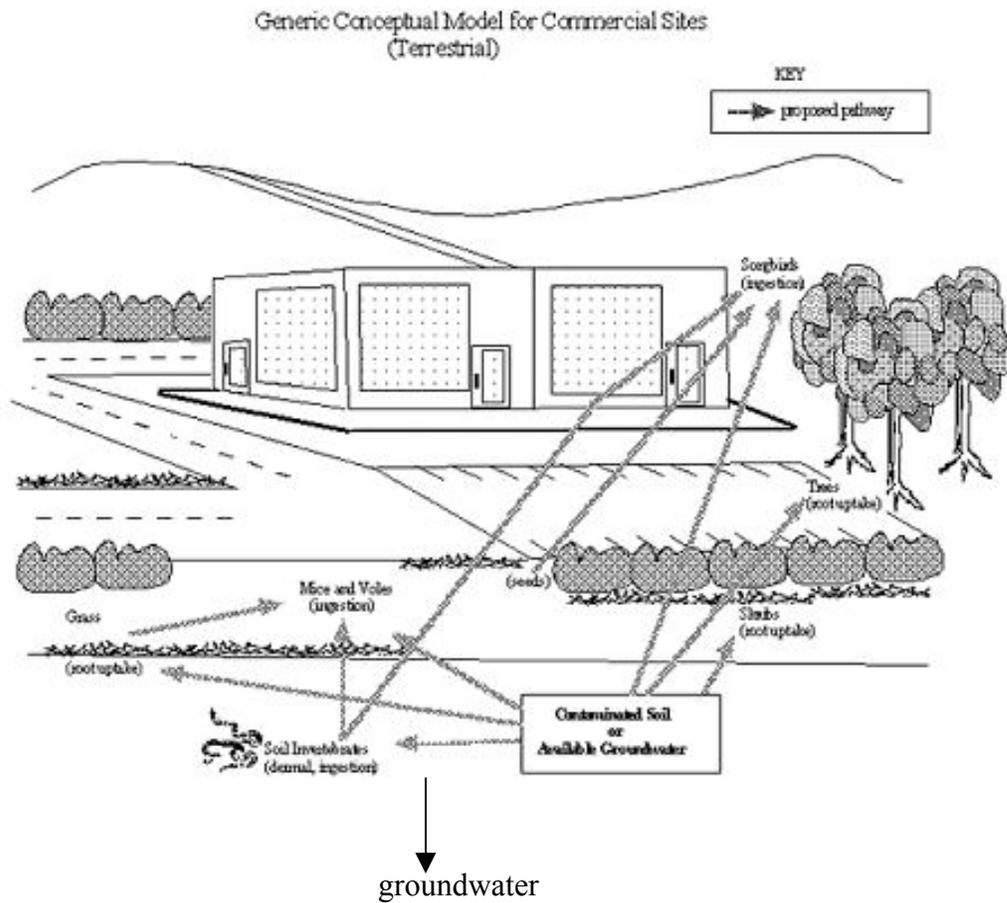
2.3.2 Ecological Receptors

The potential ecological receptors include:

- Small mammals
- Birds
- Plants

2.4 Preliminary Conceptual Model/s

This figure is a preliminary conceptual model for the site.



3 RESPONSE TO SRA1 QUESTIONS (For Commercial Land Use)

3.1 General Questions¹

3.1.1 Q1-1

Is a beneficial use the sole source of contamination and is that contamination localized around the beneficial use only? Beneficial uses include zinc within 0.3m of galvanized materials and soil within 0.3m of treated wood.

If NO or UNCERTAIN, then proceed to Question 1-2

If YES, then requirements for SRA1 have been met. No further assessment is required. Prepare SRA1 case narrative.

ANSWER: NO, the contamination is not associated with galvanized material or treated wood (see figure 1).

3.1.2 Q1-2

Is site contamination located in:

A. *SEDIMENT* (particulate material that usually lies below water – Sediment Criteria and Guidance, Protocol 19) *or SURFACE WATER* (streams, rivers, lakes, estuaries, ocean or other water bodies as defined in Section 2.2.3 of the Tier 1 Ecological Risk Assessment Guidance, Protocol 1)

If NO, then proceed to 1-3

If YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: NO, there is no surface water on or adjacent to the Site (see figure 1).

3.1.3. Q1-3

Has site contamination migrated to adjacent properties
OR is fate and transport modeling required to determine the potential for migration to adjacent property?

If NO, then proceed to Question 1-4

If YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

¹ NOTE: Technically a user may move from the general questionnaire to the human and ecological exposure questionnaires at Q1-4, however for information purposes, we provide answers to all general questions in this example.

ANSWER: NO, contamination is associated with non-leaching sandblast grit and is 5 meters from the groundwater table (see Figure 2). The building is over thirty years old and the grit was placed prior to construction. No contamination has been detected in groundwater wells at the Site.

3.1.4 Q1-4

Is the contaminated portion of the property or areas to which contamination has migrated covered by a barrier including but not limited to: pavement/cement, buildings that will prevent wildlife or human contact with the soil? The barrier must be permanent under current and foreseeable future conditions and must be maintained as such.

If NO or UNCERTAIN, then proceed to Question 1-5

If YES, then proceed to the human exposure questionnaire (Q2-2) and ecological exposure questionnaire (Q3-2) to investigate the groundwater pathway

ANSWER: YES, the site (contaminated area) is covered by building and pavement (see Figure 1).

3.1.5 Q1-5

Are there areas (and media) with contaminant concentrations that are 10x the standards or areas containing 'special waste'?

IF NO, then proceed to Question 1-6

IF YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: NO, contaminant concentrations are below 10x the standard for all chemicals and do not contain special waste (see Table 2).

3.1.6 Q1-6

Are bioaccumulative contaminants located in or migrating to accessible media on the property? (Bioaccumulative contaminants defined as $BAF \geq 5,000$ OR $BCF \geq 5,000$ OR $LogKow \geq 5.0$; BAF, BCF and Log Kow for subject contaminants must be obtained from peer reviewed literature)

IF NO, then proceed to Question 1-7.

IF YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site.

ANSWER: NO, no contaminants present at the Site have a $BAF \geq 5,000$ OR $BCF \geq 5,000$ OR $LogKow \geq 5.0$.

3.1.7 Q1-7

Is contamination located in or migrating to the upper 1m of soil?

IF NO, then proceed to the human exposure questionnaire (Q2-2) and ecological exposure questionnaire (Q3-2) to investigate the groundwater pathway

IF UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2, or decide to remediate the site

IF YES, proceed to both the human and ecological exposure questionnaires

ANSWER: NO, there are no contaminants in the upper meter of soil (see Table 2 and Figure 2).

3.2 Human Exposure Questions

3.2.1 Q2-1

Are humans (e.g., trespassers, recreational users, workers, residents) participating in outdoor activities on the property or in areas adjacent to the property where generic soil or applicable human health protection “intake of contaminated soil” matrix standards are exceeded?

IF NO, then proceed to Question 2-2

IF YES or UNCERTAIN, then SRA1 may not be appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: YES, the Site is used as a warehouse to stored canned food goods and workers are present inside and as needed outside the warehouse building (see Section 2 and Figure 1).

3.2.2 Q2-2

Are humans living, or working in buildings located on the property or on adjacent properties?

IF NO, then human health risk is acceptable, exit the Human Exposure Questionnaire.

IF YES or UNCERTAIN, then proceed to Question 2-3.

ANSWER: YES, workers are working at the building located at the property (see Section 2 and Figure 1).

3.2.3 Q2-3

Are volatile contaminants present in subsurface media? (Volatile contaminants include analytes on United States Environmental Protection Agency, Volatile Organic Compounds Gas Chromatography/Mass Spectrometry Analyte List, Method 8260B)

IF NO, then proceed to Question 2-4

IF YES or UNCERTAIN, then SRA1 may not be appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: NO, volatile contaminants are not present in media (see Section 2 and 3 and Table 2 and Table 4).

3.2.4 Q2-4

Are non-volatile contaminants present in groundwater?

IF NO, then human health risk is acceptable, exit the Human Exposure Questionnaire

IF YES or UNCERTAIN, then proceed to Question 2-5

ANSWER: NO, contaminants are not present in groundwater (see Section 2 and 3 and Table 4). Exit Human Exposure Questionnaire

3.3 Ecological Exposure Questions

3.3.1 Q3-1

Is bare or vegetated soil available on the site?

(Landscaped areas on commercial or industrial sites in urban areas are excluded from ecological screening in SRA1; in addition soil or vegetation in planters (soil confined by a container or on top of a structure) or vegetation growing through a barrier (e.g. cracks in concrete) are excluded.)

IF NO, proceed to Question 3-2

IF YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: NO, bare soil and vegetation are not present at the Site (see Section 2 and 3 and Table 2). (Remember the Site is not the property boundary but the contaminated area).

3.3.2 Q3-2

Is groundwater contamination on the site within 1km of aquatic media?

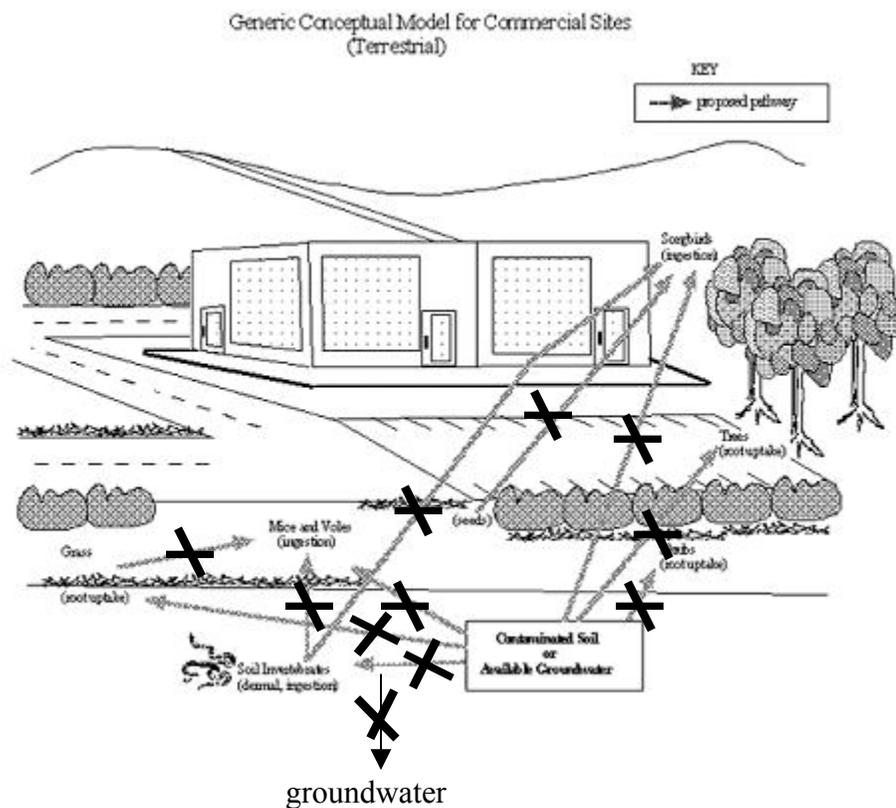
IF NO, then ecological risk is acceptable, exit the Ecological Exposure Questionnaire

IF YES or UNCERTAIN, then SRA1 is not appropriate for the site, proceed to SRA2, DRA1, DRA2 or decide to remediate the site

ANSWER: NO, contamination is associated with non-leaching sandblast grit and is 5 meters from the groundwater table. No contamination has been detected in groundwater wells at the Site.

4 FINAL CONCEPTUAL MODEL

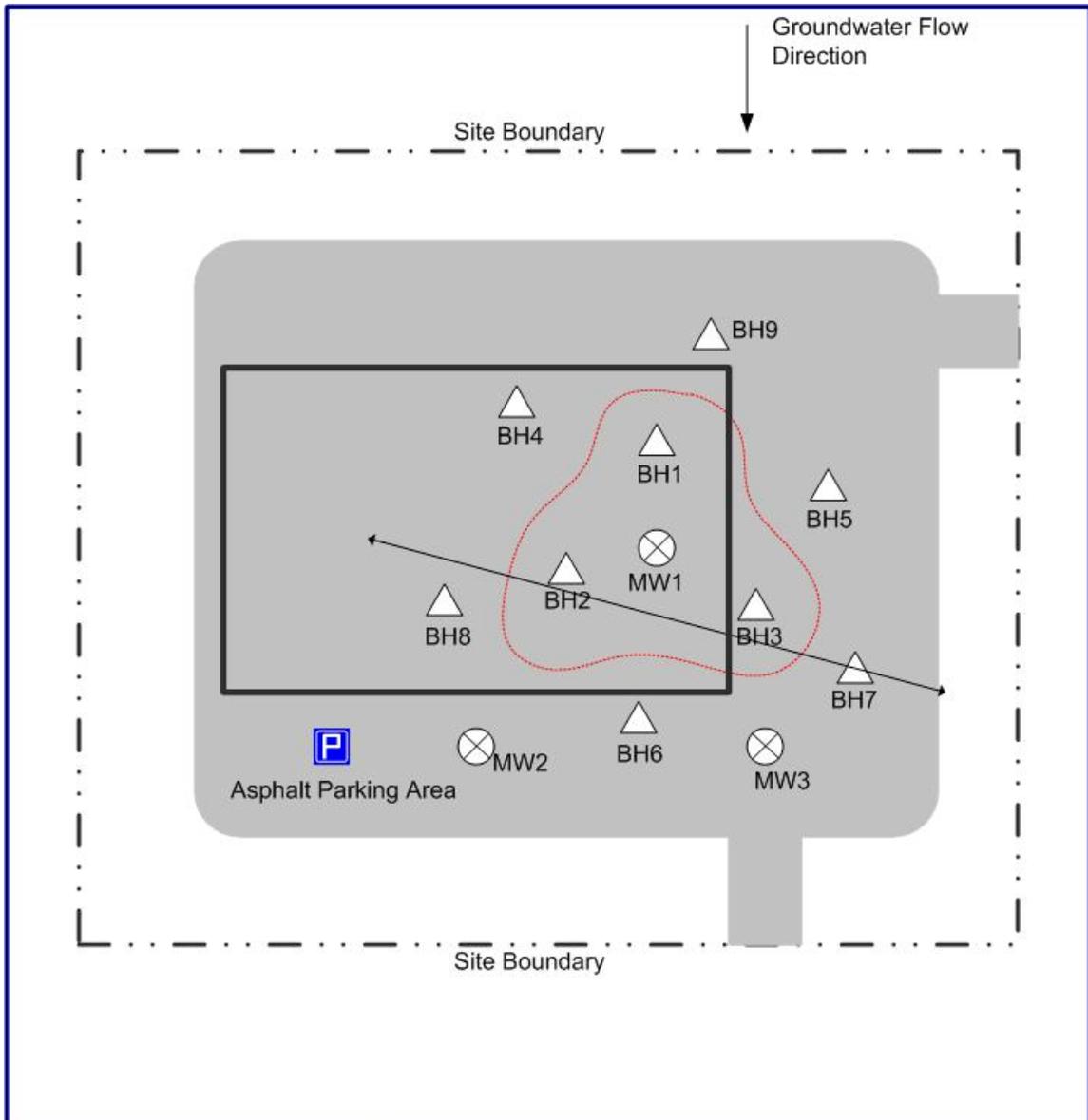
The final SRA1 site conceptual model (SCM) has no operative pathways.

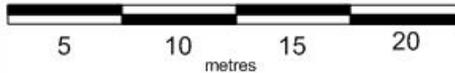
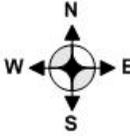


5 CONCLUSION

No complete exposure pathways were determined to be present at the Site. As a result of no complete exposure pathways being present at the Site as assessed in this SRA1 no further investigation and remediation is warranted at this Site.

6 PROFESSIONAL STATEMENT



<ul style="list-style-type: none">  Cross-Section  Borehole  Monitoring Well  Building  Asphalt Area  Soil Contamination 	<p>NOTE: All features are approximate in size and location</p> 	
<p>Figure 1. Site Plan ABC Environmental Ltd.</p>		<p>June 2004 Drawn By: GAW</p>

