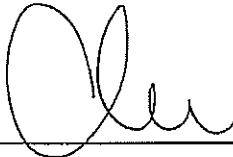


MTR Corporation Limited

Kwun Tong Line Extension (KTE)

Reconnaissance Site Visit Report
for the Kerosene Store at Chung Hau Street

(July 2011)

Verified by: 

Position: Independent Environmental Checker

Date: 25 July 2011

MTR Corporation Limited

Kwun Tong Line Extension (KTE)

Reconnaissance Site Visit Report
for the Kerosene Store at Chung Hau Street

(July 2011)

Certified by: Glenn Frommer
Position: Environmental Team Leader
Date: 25 JUL 2011


NISHIMATSU CONSTRUCTION CO. LTD.

**MTRC Contract No. 1001
Kwun Tong Line Extension:
Yau Ma Tei to Whampoa Tunnels
and Ho Man Tin Station**

**Reconnaissance Site Visit Report
For the Kerosene Store at Chung Hau Street**

(Version 5.0)

July 2011

Approved By	 (Principal Environmental Consultant: Mr. K.S. Lee)
-------------	---

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

CINOTECH CONSULTANTS LIMITED

Room 1710, Technology Park
18 On Lai Street
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

TABLE OF CONTENTS

	Page
1 INTRODUCTION	1
2 KEROSENE STORE	2
3 RECONNAISSANCE SITE VISIT	2
4 REMOVAL OF THE KEROSENE TANKS.....	3
5 CONFIRMATORY SAMPLING.....	4
6 CONCLUSION.....	5

List of Figure

Figure 1 Proposed Confirmatory Sampling Location on the Existing Slope

List of Annex

Appendix I Location of the Kerosene Store and BH1
Appendix II Layout Plan and Sectional View of the Kerosene Store
Appendix III Photos of Inspected Items During Reconnaissance Site Visit
Appendix IV Testing Method and Reporting Limit for Soil and Risk-Based Remediation Goals for Soil and Soil Saturation Limit

1 INTRODUCTION

- 1.1 The Kwun Tong Line Extension (the Project) is the proposed extension of the existing Kwun Tong Line (KTL) from Yau Ma Tei (YMT) Station to a new Whampoa (WHA) Station with an interchange with the proposed Shatin to Central Link (SCL) at the proposed Ho Man Tin (HOM) Station.
- 1.2 The Project is classified as a designated project under the Environmental Impact Assessment Ordinance (EIAO). An Environmental Impact Assessment (EIA) report was prepared and approved on 19 August 2010 (Register No.: AEIAR-154/2010).
- 1.3 Land contamination assessment was conducted and presented in Section 11 of the EIA. The EIA report mentioned that potential contamination is anticipated at the concord kerosene store at No.33, Chung Hau Street, Ho Man Tin due to the 3 kerosene storage tanks at the lowest floor of the store. Soil sampling was conducted at borehole BH1 which is located on the existing slope beneath Concord kerosene store. The location of the kerosene store and borehole BH1 were shown in **Appendix I**. Analysis results of the samples as included in the Contamination Assessment Report (CAR) in Appendix 11.2 of the approved EIA indicated that no exceedance of the Risk-Based Remediation Goals for Soil and Soil Saturation Limit was found. There was no groundwater encountered at BH1. It was recommended in the EIA and CAR that when the permission for access is granted at the time when the land is resumed, a reconnaissance site visit should be carried out to review whether further SI would be required.
- 1.4 In the Environmental Permit (EP No.: EP-399/2010/A) Section 3.7 stipulated that *“The Permit Holder shall carry out reconnaissance site visit to the kerosene store at Chung Hau Street (which falls within the Ho Man Tin Station works site). Within two weeks after the completion of reconnaissance site visit, the Permit Holder shall report to the Director in writing of any contamination hotspot(s) identified from the reconnaissance site visit. The report shall be certified by the ET Leader and verified by the IEC. If contamination hotspot(s) is (are) identified, the Permit Holder shall carry out further land contamination site investigation and shall submit the following to the Director for approval. The submissions shall be certified by the ET Leader and verified by the IEC before submitting to the Director:*
- (i) Three sets of Supplementary Contamination Assessment Plan (CAP) after the completion of the reconnaissance site visit to the kerosene store at Chung Hau Street;*
 - (ii) Three sets of Supplementary Contamination Assessment Report (with Remediation Action Plan if contamination is confirmed) as soon as possible after the approval of the CAP by the Director under the above Condition 3.7(i);*
 - (iii) Three sets of Remediation Report after the completion of the remediation works recommended by the approved Remediation Action Plan (if any) under the above Condition 3.7(ii).*
- No work on the identified potentially contaminated sites shall be carried out unless and until the above submissions are approved by the Director.”*
- 1.5 The project proponent, MTR Corporation, has requested the KTE1001 project main contractor, Nishimatsu Construction Co. Ltd., to conduct the reconnaissance site visit. Cinotech Consultants Limited (the consultant) was appointed by the Project main contractor (the client) to conduct the reconnaissance site visit and to prepare a reconnaissance site visit report according to the EP condition.

2 KEROSENE STORE

- 2.1 The kerosene store at Chung Hau Street was operated by Concord Oil (Hong Kong) Limited until 2010 under the Short Term Tenancy land lease (STT KX1484). It is vacant currently. The location of the kerosene store is shown in **Appendix I**.
- 2.2 The kerosene store was built in 1970's. The store contains five levels: Roof Floor, Ground Floor, Lower Ground Floor, Sub-Lower Ground Floor and Underground Tank Level. There are three kerosene tanks in the Underground Tank Level. The as-built layout plan and the sectional view of the kerosene store are shown in **Appendix II**. These are the latest drawings available from Building Department in 2008. The information in the drawings was mainly in line with our observations during the site visit.
- 2.3 According to the Contamination Assessment Plan (CAP) in Appendix 11.1 of the approved EIA, there was no record of spillage incidents reported at this kerosene store. The dimension of all the 3 tanks are approximately 10m (L) x 5m (W) x 2.5m (H) and they are contained in a concrete box containment of 12.5m (L) x 6m (W) x 3.5m (H).

3 RECONNAISSANCE SITE VISIT

- 3.1 The reconnaissance site visit for the kerosene store at Chung Hau Street was carried out on 11 July 2011 with representatives from the MTR Corporation, the main contractor, the consultant (Cinotech), the ET (MTR Corporation) and the IEC (Arup). The corresponding photos of inspected items are shown in **Appendix III**.
- 3.2 At Roof Floor, the floor slab was concrete paved with no crack and the ceiling was made of iron sheets. The floor area of this floor was about 360 m². This area seems to be used as a store and there was no evidence of significant contamination source or visual evidence of spillage observed through the site visit in Roof Floor. [Photo 1, 2]
- 3.3 At Ground Floor, the floor slab and the ceiling were concrete paved with no crack. The floor area of this floor was about 360 m². This area seems to be used as a store and with road access to Chung Hau Street. The filling points and filling area of kerosene are also on this floor [Photo 14]. A DG store was found near the entrance with concrete paved and no crack. No LPG container or stain was found within the store. [Photo 13] An oil layer (about 1m x 1m) was found on the ground in the eastern corner of this floor. This area seems to be used for filling of the retail kerosene containers. It was believed that kerosene was dropped on the area during filling process. Apart from the above oil stain area, no other stain or leakage was found at the Ground Floor. The oil layer was a localized spot on the concrete of the floor slab. The concrete floor slab with oil stain will be disposed of by means of chemical waste in accordance with Waste Disposal Ordinance. However, it was not identified as contamination hotspot. [Photo 3, 4]
- 3.4 At Lower Ground Floor, the floor slab and the ceiling were concrete paved with no crack. The floor area of this floor was about 320 m². This area seems to be used as office and there was no evidence of significant contamination source or contaminated area found. [Photo 5]

- 3.5 At Sub-Lower Ground Floor, the floor slab and the ceiling were concrete paved with no crack. [Photo 6, 7] The floor area of this floor was about 300 m². This area seems to be used as a store. Three kerosene tanks at the Underground Tank Level were accessible through three metal covers on the floor slab of this Sub-Lower Ground Floor. These tanks are contained within walls of about 9-inch thick concrete forming a “box containment” and in addition, the containment is filled with sand which covers a large portion of three tanks inside. The tops of the three tanks were disclosed and smell of kerosene was noticeable after removal of the three metal covers. No leakage was found in the observable pipes connecting to the top of the tanks. The observable pipes are in good condition and no potential leakage was identified. No abnormal colour was found in the sand under the observable pipes. [Photo 8] The tanks were connected through the filling points at Ground Floor via the pipes which run outside external wall of the building. No evidence of pipe leakage was observed.
- 3.6 The Underground Tank Level was accessible from outside of the kerosene store through the slope near the Concord kerosene store. The floor area of this floor was about 75 m². The dimension of all the 3 tanks are approximately 10m (L) x 5m (W) x 2.5m (H) and they are contained in a concrete box containment of 12.5m (L) x 6m (W) x 3.5m (H). All four sides of the concrete box wall are exposed to air. [Photo 9] However, the three tanks could not be inspected directly from the Underground Tank Level due to the fact they were housed in a concrete box containment filled with sand. The concrete box containment was sited on a layer of filled rocks and the existing slope was found below that layer. [Photo 10] Some filled rocks (about 0.1m x 0.1m) under the concrete box containment could be removed and part of the box was inspected during the site visit. No soil was found on the inspected area under the concrete box and no visual evidence of spillage was observed. [Photo 11] A concrete structure housing three pumps was found next to the concrete box containment. The floor slab under the three pumps was concrete paved with no crack. No stain was observed on the floor slab and no leakage was found in the observable pipes. The suspected stain area (0.2m x 0.2m) was observed on the brick wall which will be disposed of by means of chemical waste in accordance with Waste Disposal Ordinance [Photo 12]. No hotspot was identified in this area.
- 3.7 The three tanks, three pumps and the connecting pipes were classified as potential contamination source. All observable parts of the pipes were found without leakage. No crack was observed on the concrete paved floor holding three pumps. The three tanks were stored within the concrete box containment. No contamination hotspot was identified by the inspection team during the reconnaissance site visit except the three tanks and the internal surface of the concrete box containment that inspection team could not access for inspection. Therefore, it is proposed to carry out confirmatory sampling as described in Section 4 and 5 after demolition of the kerosene store and removal of the kerosene tanks to determine the area where could not be accessed during the reconnaissance site visit.

4 REMOVAL OF THE KEROSENE TANKS

- 4.1 The kerosene store will be demolished from top to bottom. After removal of the floor slab of the Sub-Lower Ground Floor, the residual kerosene in the tank will be pumped out and the tanks will be cleaned. The connecting pipes will be disconnected. The sand inside the concrete box containment will be removed before the kerosene tanks to be removed. Then, the three kerosene tanks will be removed from the concrete box

containment. A further inspection is required to determine whether crack is present on the internal surface of the concrete box containment. The three tanks, the three pumps, the connecting pipes, the suspected stain area on the brick wall near the three pumps and the sand inside the concrete box containment, which are independent of the result of the further inspection, will be disposed of by means of chemical waste in accordance with Waste Disposal Ordinance.

- 4.2 During the further inspection, the concrete box containment will be inspected first. If there is no stain on the concrete box containment, it will be confirmed that no hotspot is identified.
- 4.3 If stain is found but there is no crack on the concrete box containment, it will be confirmed that no hotspot is identified. However, the stained concrete will be disposed of as chemical waste in accordance with Waste Disposal Ordinance.
- 4.4 If stain and crack are found on the concrete box and rock with stain is found in the existing slope after removal of the concrete box containment and the layer of filled rocks, the contaminated rock will be disposed of by means of chemical waste in accordance with Waste Disposal Ordinance and confirmed that no hotspot is found. If stain is not found on the rock, it will be also confirmed that no hotspot is identified.
- 4.5 If stain and crack are found on the concrete box and soil is found in the existing slope after removal of the concrete box containment and the layer of filled rocks, confirmatory sampling will be conducted on the soil of the existing slope under the concrete box containment.

5 CONFIRMATORY SAMPLING

Proposed Confirmatory Sampling Locations

- 5.1 Total 8 sampling locations (A-1 to A-3, B-1 to B-4 and C-1) are proposed for soil sampling. The sampling level of the proposed sampling locations is on the existing slope (about 29.4 mPD) under the layer of filled rocks and the concrete box containment. A-1 to A-3 are directly below the middle point of each tank. B-1 to B-4 are immediately adjacent to the tanks to determine whether any leakage through the bottom edge of the concrete box containment. The above 7 samples are needed if crack was found in the concrete box containment and soil was found in the existing slope. C-1 is under the concrete floor slab for the three pumps. This sample shall be taken after removal of the pumps and concrete slab if soil is found under the concrete slab. All the samples will be taken on the surface of the existing slope under the concrete box containment. One sample will be taken in each location as shown in **Figure 1**.

Table 4-1 Proposed Confirmatory Sampling Locations

Sampling ID	Descriptions	Sampling Condition
A-1	On the existing slope, under middle point of Tank No. 1	Conditional as per Section 4
A-2	On the existing slope, under middle point of Tank No. 2	
A-3	On the existing slope, under middle point of Tank No. 3	
B-1	On the existing slope, southeast to Tank No. 2	

B-2	On the existing slope, southwest of Tank No. 3	
B-3	On the existing slope, northwest of Tank No. 2	
B-4	On the existing slope, northeast of Tank No. 1	
C-1	On the existing slope, under the concrete floor slab for the three pumps	Conditional as per Section 5.1

Sampling Plan

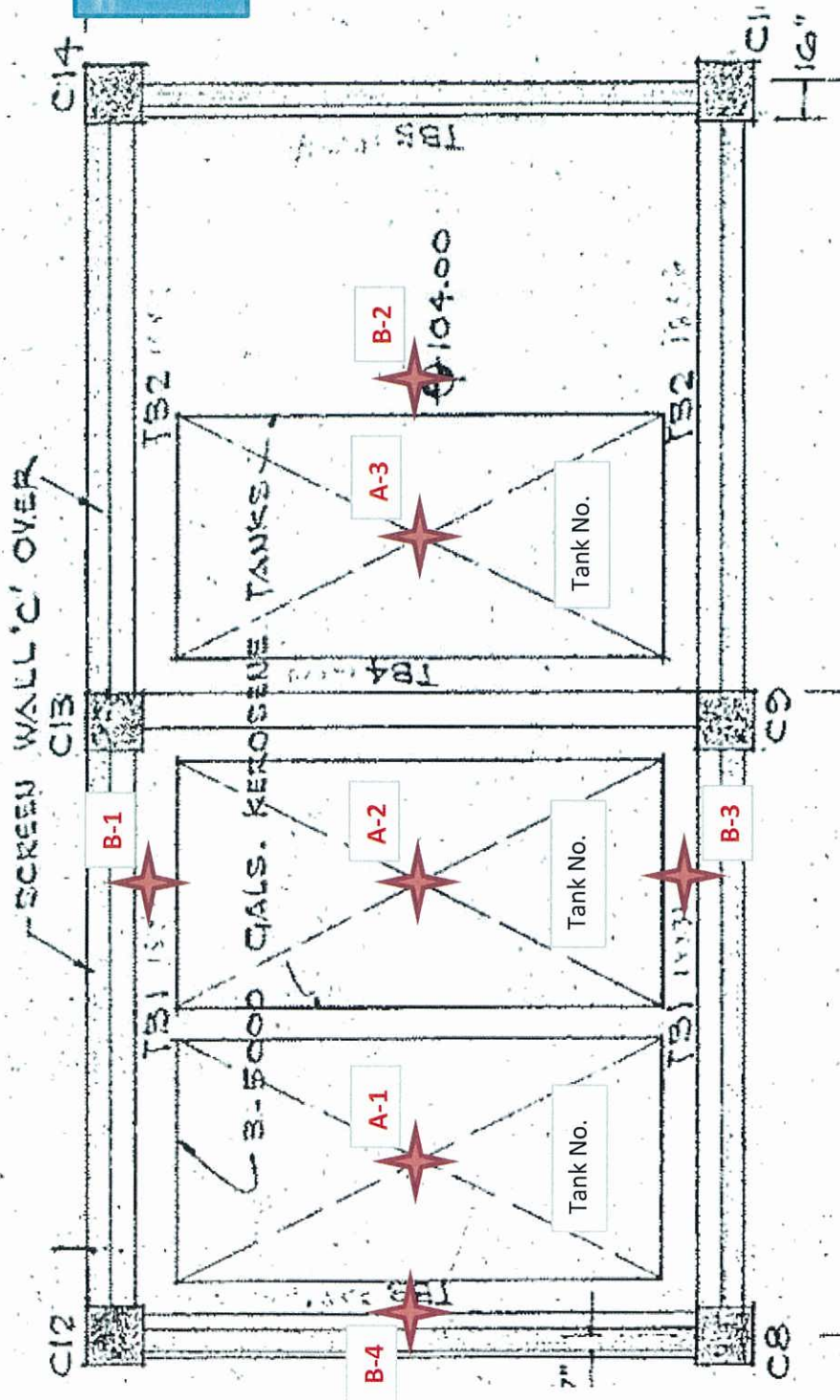
- 5.2 Based on the reconnaissance site visit, kerosene is the only possible contamination source in the kerosene store. The main contaminants are TPH (total petroleum hydrocarbons), BTEX (benzene, toluene, ethylbenzene and xylenes), PAH (polycyclic aromatic hydrocarbons) and metals. The testing parameters, the testing method and the reporting limit for the confirmatory samples can be found in **Appendix IV**. The samples collected shall be analysed by an HOKLAS accredited laboratory, and each testing parameter including its testing method shall be HOKLAS accredited
- 5.3 The results of the confirmatory sampling shall be interpreted in accordance with the Guidance Note for Contaminated Land Assessment and Remediation, and Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management. The future land use of the kerosene store is for Railway which is classified as "Industrial" according to the EIA. The Risk-Based Remediation Goals for Soil and Soil Saturation Limit of the confirmatory samples can be found in **Appendix IV**.
- 5.4 A report summarized the results of the inspection and the confirmatory samplings after removal of the tanks and the concrete box containment will be prepared by the consultant of the main contractor and certified by ETL and verified by IEC.
- 5.5 If there is exceedance in any testing parameter of any confirmatory sample, contamination hotspot(s) is (are) identified. The Supplementary CAP, CAR and RAP will be prepared and submitted to EPD in accordance with EP's condition section 3.7.

6 CONCLUSION

- 6.1 According to the EP's condition, a reconnaissance site visit was conducted for the kerosene store at Chung Hau Street. No contamination hotspot was identified within the store except the three tanks and the internal surface of the concrete box containment that inspection team could not access for inspection.
- 6.2 Three kerosene tanks, three pumps and the connecting pipes were found and identified as the potential source of contamination. A further inspection will be conducted to determine whether there is crack and stain on the concrete box containment after removal of the tanks.
- 6.3 If crack and stain are found in the concrete box and soil is found in the existing slope, confirmatory sampling will be taken on the soil of the existing slope below the concrete box containment after its removal.

- 6.4 A report summarized the results of the inspection and the confirmatory samplings after removal of the tanks and the concrete box containment will be prepared by the consultant of the main contractor and certified by ETL and verified by IEC.
- 6.5 If there is exceedance in any testing parameter of any confirmatory sample, contamination hotspot(s) is (are) identified. The submission of CAP, CAR and RAP in accordance with the EP's condition section 3.7 will be required.

Figures



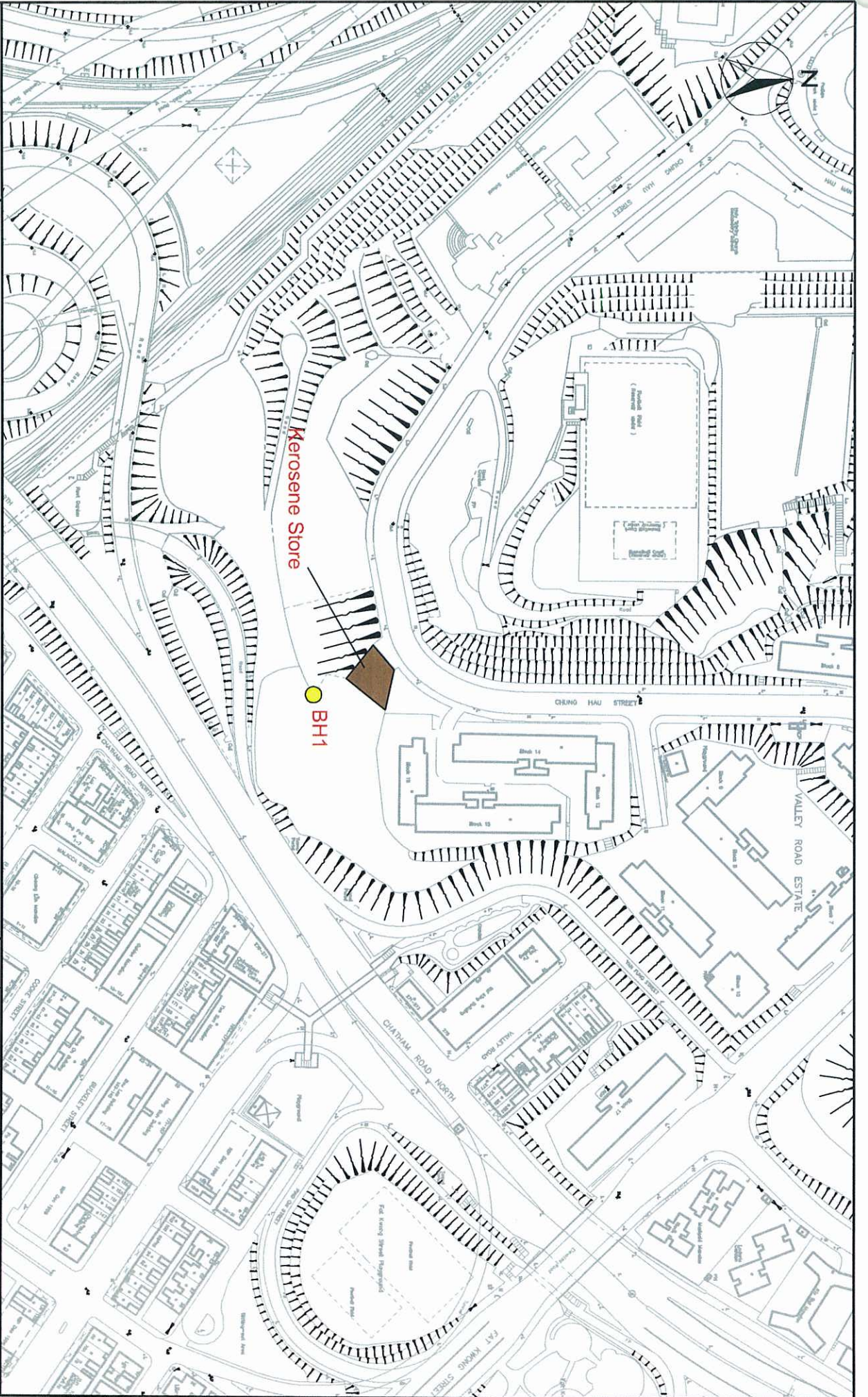
Chung Hau Street

Project Title Reconnaissance Site Visit Report for the Kerosene Store at Chung Hau Street	Scale	N.T.S.	Project No	LC10079
	Figure Title Proposed Confirmatory Sampling Location on the Existing Slope	Date	JUL11	Figure

CINOTECH

Appendix I

The Location of the Kerosene Store



Reconnaissance Site Visit Report for the Kerosene Store at Chung Hau Street

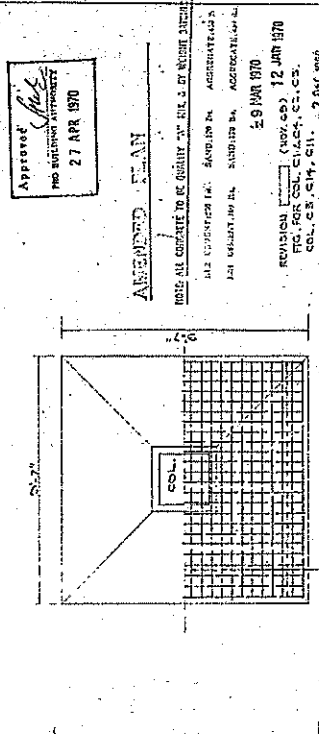
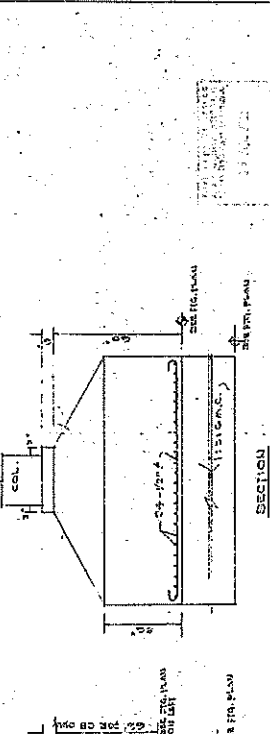
Location of Kerosene Store & BH1

SCALE	N.T.S.	DATE	JUL 11
CHECK	K.S.	DRAWN	CM
JOB NO.	LC10079	FIGURE NO.	A01
		REV	-

Appendix II

The Layout Plan and Sectional View of the
Kerosene Store

	UPPER FLOOR TO LOWER LEVEL BLOCKS	LOWER GRID BLOCK TO SUB-FLOOR FROM FLOOR	UPPER LEVEL GRID BLOCK TO FLOORING
C3			
COL. SITE	10' x 10'	10' x 10'	10' x 10'
VERT. DIMS	4'-11"	4'-11"	4'-11"
SURFACE	1/4" @ 6 3/4"	1/4" @ 6 3/4"	1/4" @ 6 3/4"
C11			
COL. SITE	10' x 10'	10' x 10'	10' x 10'
VERT. DIMS	4'-11"	4'-11"	4'-11"
SURFACE	1/4" @ 6 3/4"	1/4" @ 6 3/4"	1/4" @ 6 3/4"
COL. SITE	10' x 10'	10' x 10'	10' x 10'
VERT. DIMS	4'-11"	4'-11"	4'-11"
SURFACE	1/4" @ 6 3/4"	1/4" @ 6 3/4"	1/4" @ 6 3/4"



APPROVED BY: [Signature]

27 APR 1970

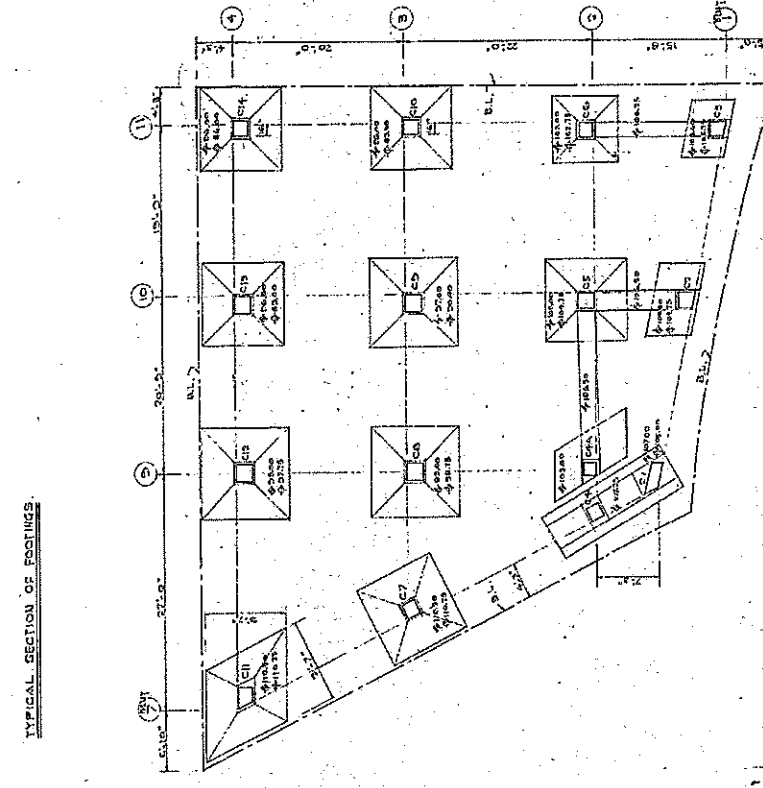
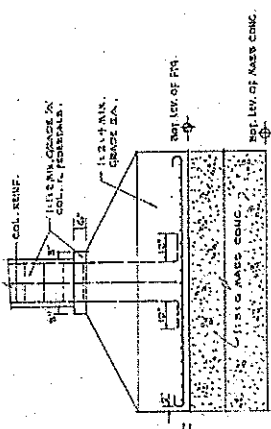
REVISION: (REVISED) 12 JAN 1970

FOR: (REVISED) 12 JAN 1970

BY: (REVISED) 12 JAN 1970

PROJECT: [Details]

DATE: [Details]



RECEIVED 31

19 JAN 1970

RECEIVED BY: [Signature]

RECEIVED 3

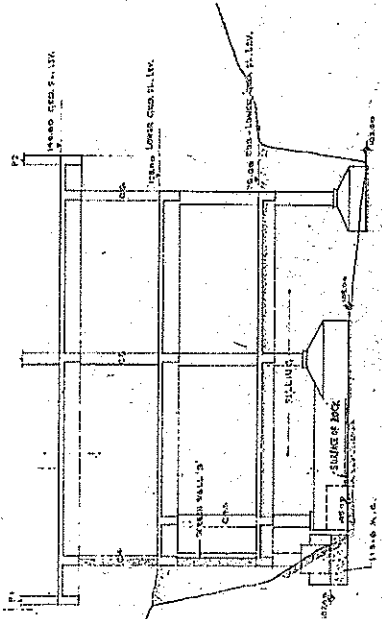
19 JAN 1970

RECEIVED BY: [Signature]

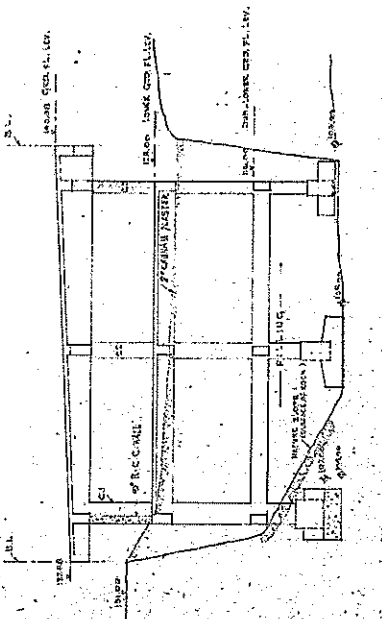
RECEIVED 3

19 DEC 1969

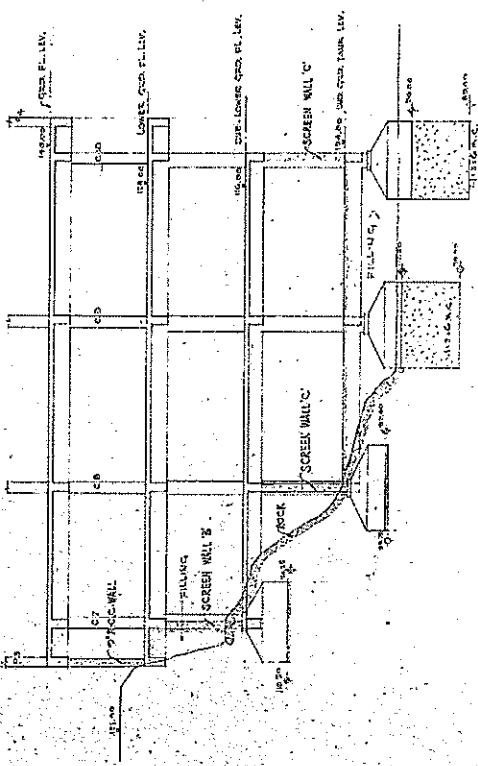
RECEIVED BY: [Signature]



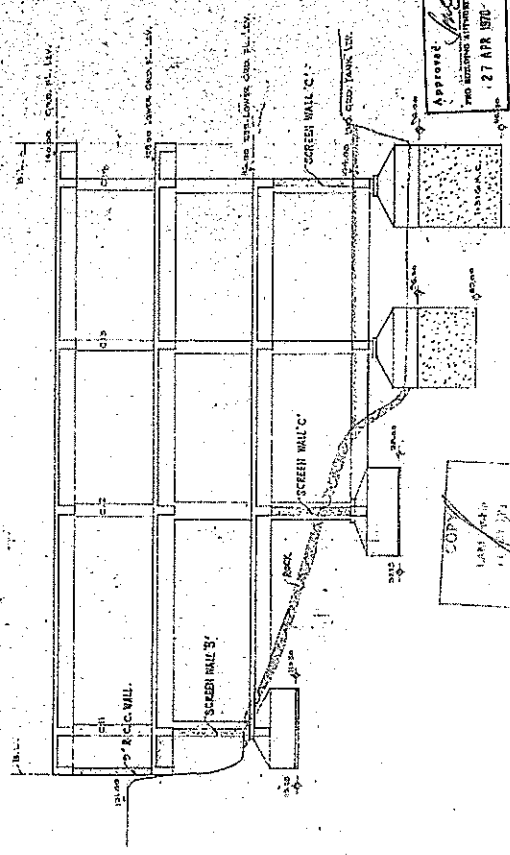
SECTION AT BENT '2'



SECTION AT BENT '1'



SECTION AT BENT '3'



SECTION AT BENT '4'

Approved: *[Signature]*
27 APR 1970

TOP
LAYERS
11/10/70

NOTE: ALL THE DIMENSIONS SHOWN ARE SHOWN ON SECTION AT BENT 1, 2, 3, 4, 7, 8, 10, 11.
REVISION: (10/1/50, 6)

PROJECT NO.	100-100-100-100
PROJECT NAME	BRIDGE OVER RIVER, INDIANAPOLIS, IN.
DESIGNED BY	R. C. DEWALD
CHECKED BY	[Signature]
DATE	27 APR 1970

RECORDED 31
- 9 MAR 1970



Appendix III
The Photos of the Inspected Items





Photo 1: The ceiling of the Roof Floor was made of iron sheets.



Photo 2: The floor slab of the Roof Floor was concrete paved. No visual evidence of spillage/staining was observed.

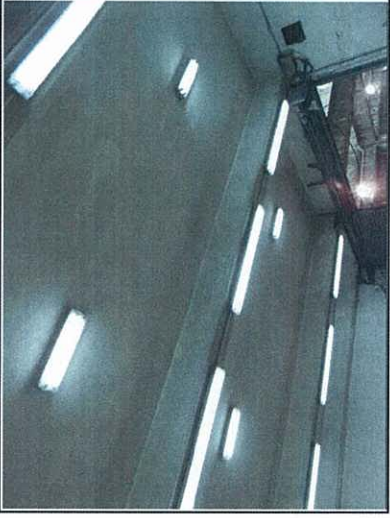


Photo 3: The ceiling of the Ground Floor was concrete paved.

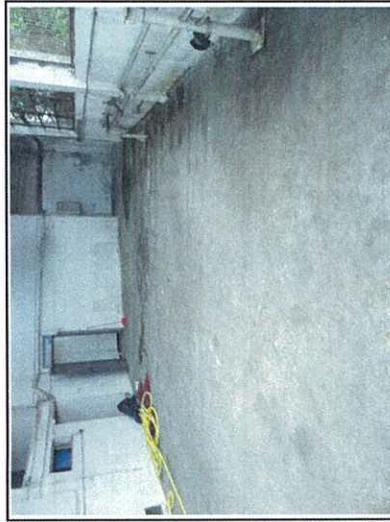


Photo 4: The floor slab of the Ground Floor was concrete paved with no crack. An oil layer (about 1m x 1m) was found in eastern corner but it was a localized spot. The concrete floor slab with oil stain will be disposed of as chemical waste.



Photo 5: The floor slab of the Lower Ground Floor was concrete paved. No visual evidence of spillage/staining was observed.



Photo 6: The ceiling of the Sub-Lower Ground Floor was concrete paved.

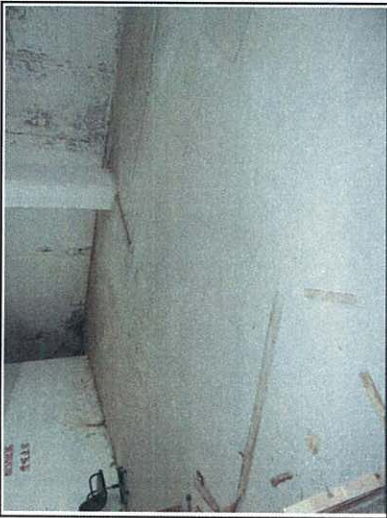


Photo 7: The floor slab of the Sub-Lower Ground Floor. No visual evidence of spillage/staining was observed.



Photo 8: The top of the three kerosene tanks can be found after removal of three metal covers in the floor slab of Sub-Lower Ground Floor. No leakage found in the pipes connecting the tanks. No visual evidence of spillage/staining was observed.



Photo 9: The wall of concrete box containment on Underground Tank Level was exposed to air. The concrete box is used to hold the three tanks inside.



Photo 10: The concrete box containment was placed on a layer of filled rocks.



Photo 11: Some of the filled rocks under the concrete box containment was removed during site visit. No soil was found on the inspected area under the concrete box and no visual evidence of spillage was observed.

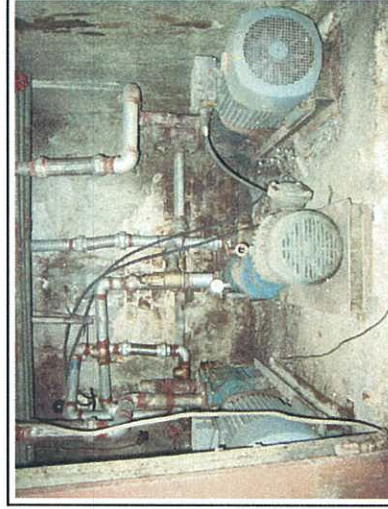


Photo 12: The floor slab under the three pumps next to the concrete box containment was concrete paved with no crack. Stain was suspected on the brick wall (0.2m x 0.2m). The concrete floor slab will be disposed of as chemical waste.



Photo 13: A DG store was found near the entrance of Ground Floor. The store was concrete paved with no crack. No LPG container or stain was found within the store.



Photo 14: The filling point of kerosene was found near the entrance of Ground Floor.

Appendix IV

Testing Method and Reporting Limit for Soil and
Risk-Based Remediation Goals for Soil and Soil
Saturation Limit

Appendix IV - Testing Method and Reporting Limit for the Soil

Chemical	Test Method	Reporting Limit for Soil (mg/kg)
BTEX		
Benzene	USEPA 8260	0.2
Ethylbenzene		0.2
Toluene		0.2
Xylenes (Total)		0.4
PAHs		
Acenaphthylene	USEPA 8270	0.5
Anthracene		0.5
Benzo(a)anthracene		0.5
Benzo(a)pyrene		0.5
Benzo(b)fluoranthene		0.1
Benzo(g,h,i)perylene		0.5
Benzo(k)fluoranthene		0.1
Chrysene		0.5
Dibenzo(a,h)anthracene		0.5
Fluoranthene		0.5
Fluorene		0.5
Indeno(1,2,3-cd)pyrene		0.5
Naphthalene		0.5
Phenanthrene		0.5
Pyrene	0.5	
Metals		
Antimony	USEPA 6020A	0.5
Arsenic		1
Barium		1
Cadmium		0.1
Chromium III		5
Chromium VI		4
Cobalt		1
Copper		1
Lead		1
Mercury		0.05
Molybdenum		1
Nickel		1
Tin		1
Zinc		20
TPH		
C6 - C8	USEPA 8015	50
C9 - C16		50
C17 - C35		100

According to Guidance Manual for Use Risk-Based Remediation Goals for Contaminated Land Management, all laboratory test methods must be accredited by the HOKLAS or one of its Mutual Recognition Arrangement.

Appendix IV - Risk-Based Remediation Goals for Soil and Soil Saturation Limit

Chemical	Risk-Based Remediation Goals for Soil	Soil Saturation Limit (C _{sat}) (mg/kg)
	Industrial (mg/kg)	
BTEX		
Benzene	3.21E+00	3.36E+02
Ethylbenzene	8.24E+03	1.38E+02
Toluene	1.00E+04*	2.35E+02
Xylenes (Total)	1.23E+03	1.50E+02
PAHs		
Acenaphthylene	1.00E+04*	1.98E+01
Anthracene	1.00E+04*	2.56E+00
Benzo(a)anthracene	9.18E+01	-
Benzo(a)pyrene	9.18E+00	-
Benzo(b)fluoranthene	1.78E+01	-
Benzo(g,h,i)perylene	1.00E+04*	-
Benzo(k)fluoranthene	9.18E+02	-
Chrysene	1.14E+03	-
Dibenzo(a,h)anthracene	9.18E+00	-
Fluoranthene	1.00E+04*	-
Fluorene	1.00E+04*	5.47E+01
Indeno(1,2,3-cd)pyrene	9.18E+01	-
Naphthalene	4.53E+02	1.25E+02
Phenanthrene	1.00E+04*	2.80E+01
Pyrene	1.00E+04*	-
Metals		
Antimony	2.61E+02	-
Arsenic	1.96E+02	-
Barium	1.00E+04*	-
Cadmium	6.53E+02	-
Chromium III	1.00E+04*	-
Chromium VI	2.18E+02	-
Cobalt	1.00E+04*	-
Copper	1.00E+04*	-
Lead	2.29E+03	-
Mercury	3.84E+01	-
Molybdenum	3.26E+03	-
Nickel	1.00E+04*	-
Tin	1.00E+04*	-
Zinc	1.00E+04*	-
TPH		
C6 - C8	1.00E+04*	1.00E+03
C9 - C16	1.00E+04*	3.00E+03
C17 - C35	1.00E+04*	5.00E+03

Soil saturation limits for petroleum carbon ranges taken from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil, CCME 2000; * denotes a 'ceiling limit' concentration.