TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

8. LAND CONTAMINATION

8.1 Introduction

8.1.1.1 This section presents the potential land contamination implications associated with the Project.

8.2 Environmental Legislation, Standards and Guidelines

8.2.1.1 The relevant environmental legislation guidelines and standards on land contamination aspect include the following:

- Section 3 (Potential Contaminated Land Issues) of Annex 19 "Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts" of the Technical Memorandum on Environmental Impact Assessment Process, EPD, June 2023 (EIAO-TM);

- Guidance Note for Contaminated Land Assessment and Remediation, EPD, April 2023 (Guidance Note)

  The Guidance Note sets out the requirements for proper assessment and management of potentially contaminated sites such as oil installations (e.g. oil depots, petrol filling stations), gas works, power plants, shipyards / boatyards, chemical manufacturing / processing plants, steel mills / metal workshops, car repairing / dismantling workshops and scrap yards. In addition, this Guidance Note provides guidelines on how site assessments should be conducted and analysed and suggests practical remedial measures that can be adopted for the clean-up of contaminated sites;

- Practice Guide for Investigation and Remediation of Contaminated Land, EPD, April 2023 (Practice Guide)

  The Practice Guide outlines typical investigation methods and remediation strategies for the range of potential contaminants typically encountered in Hong Kong; and

- Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management, EPD, April 2023 (Guidance Manual)

  The Guidance Manual introduces the risk based approach in land contamination assessment and present instructions for comparison of soil and groundwater data to the Risk-Based Remediation Goals (RBRGs) for 54 chemicals of concern commonly found in Hong Kong. The RBRGs were derived to suit Hong Kong conditions by following the international practice of adopting a risk-based methodology for contaminated land assessment and remediation and were designed to protect the health of people who could potentially be exposed to land impacted by chemicals under four broad post restoration land use categories. The RBRGs also serve as the remediation targets if remediation is necessary.

8.3 Assessment Methodology

8.3.1.1 Land contamination assessment was carried out according to the abovementioned EIAO-TM, Guidance Note, Practice Guide and Guidance Manual as well as the requirements given in Section 3.4.9 and Appendix G of the EIA Study Brief (No. ESB–360/2023).

8.3.1.2 A site appraisal, including site walkover and desktop review, was conducted to identify the potentially contaminating activities that may pose adverse impact to the Project. Site walkover was conducted within the Project area to review the general site conditions and

to identify any sources of land contamination (or 'hotspots'). For the desktop review, the following information was reviewed:

- Aerial photographs and topographic maps held by the Lands Department;
- Records on dangerous goods, chemical wastes, chemical spillage/leakage and fire incidents from Environmental Protection Department (EPD) and Fire Services Department (FSD); and
- Review of available geological information in Geotechnical Appraisal Report for the Project.

8.4 Description of the Environment

TKO 137

8.4.1.1 TKO 137, located to the south of Tseung Kwan O InnoPark (TKOIP), is a sizeable piece of formed land of around 80 hectares (ha) which is currently occupied by the operation of public fill bank. It houses the site office, barging facilities, sorting facilities, and storage areas for different kinds of public fill materials.

8.4.1.2 TKO 137 falls within the approved Tseung Kwan O Outline Zoning Plan (OZP) No. S/TKO/30 and is currently zoned "Other Specified Uses (Deep Waterfront Industry)". TKO 137 is located at the southern end of Wan Po Road. To the north of TKO 137 is TKOIP (the former Tseung Kwan O Industrial Estate), while the hill slope areas to the northeast and the east of TKO 137 are the SENT Landfill and its extension area and Clear Water Bay Country Park respectively. The land to the southeast of TKO 137 is zoned "Other Specified Uses" annotated "Desalination Plant", in which there is a desalination plant. The knoll of Fat Tong Chau is zoned as "Green Belt".

TKO 132

8.4.1.3 The Project Area boundary of TKO 132 covers mainly the open sea areas of Chiu Keng Wan, Junk Bay and Lei Yue Mun with inclusion of limited areas of Green Belts along the seashore. TKO 132 is not covered by any statutory town plan. To the west of TKO 132 and further are vegetated hill slope areas and Junk Bay Chinese Permanent Cemetery.

8.5 Identification of Potential Land Contamination Concern

8.5.1 General

8.5.1.1 Site appraisal was carried out in the period from November 2023 to March 2024 with site walkovers conducted in February and March 2024. Findings of the site appraisal are presented below.

8.5.2 Review of Historical Land Uses

8.5.2.1 A review of historical aerial photographs covering the Project area has been undertaken. The aim of the review is to identify any historical land uses within the Project area that may have potential contamination implications to the Project. Findings of the review are discussed below and the reviewed aerial photographs are provided in **Appendix 8.1**.

TKO 137

8.5.2.2 A summary of the historical land uses is presented in **Table 8.1** below.

Table 8.1 Summary of Historical Land Uses for TKO 137

Year	Reference of Aerial Photos in Appendix 8.1 (Photo Reference Number)	Site Description
1963	701 to 702 (#1963-1138, 1963-8991)	The site was occupied by natural terrain and open water.
1977	705 to 706 (#18282, 18296)	No significant land uses changes were observed.
1986	709 to 710 (#A05974, A05988)	No significant land uses changes were observed.
1995	713 to 714 (#CN09725, CN11826, CN11828)	Reclaimed land was observed in and adjacent to the north of TKO 137. South East New Territories (SENT) Landfill was observed adjacent to the northeast of TKO 137. No other significant land use changes were observed.
2004	717 to 718 (#CW62811, CW62812)	The site was largely occupied by reclaimed land and the existing Tseung Kwan O Area 137 Fill Bank (TKOFB) was observed. A site office was also observed in the northwestern part of the TKOFB. Existing Tseung Kwan O Industrial Estate and Wan Po Road were observed adjacent to the north of TKO 137. No other significant land uses changes were observed.
2013	721 to 722 (#CS44766, CS44768, CS44822, CS44824)	Tseung Kwan O Area 137 Temporary Construction Waste Sorting Facilities (TKOSF) was observed in the northern and southern parts of the TKOFB. A temporary explosive magazine site was observed adjacent to the southeast of TKO 137 No other significant land uses changes were observed.
2022	725 to 726 (#E144885C, E172513C, E172515C, E172518C, E172521C, E172588C, E172666C, E177339C)	Site office at the northwestern part of the TKOFB was changed to the existing skips storage and lorries parking area. The existing WSD site office and construction materials storage area (WSD Site) were observed at the eastern part of the TKOFB. The existing SENT Landfill Extension (SENTX) was observed adjacent to the northeast and east of TKO 137. The temporary explosive magazine site was demolished and replaced by a works area of WSD. No other significant land uses changes were observed.

Source of aerial photographs: Survey and Mapping Office, Lands Department

8.5.2.3 Based on the review of aerial photographs, TKO 137 had been mainly occupied by natural terrain, open water, TKOFB (since year 2004), Wan Po Road (since year 2004), TKOSF (since year 2013), and the WSD Site (since year 2022). For TKOFB, TKOSF and the WSD Site, based on information from government departments and findings of the site walkover that no chemical spillage / leakage records were identified for these sites (refer to **Section 8.5.4 to 8.5.5** for details), no potential land contamination issues associated with these land uses to the Project are anticipated. No historical potentially contaminating land uses were identified within TKO 137.

8.5.2.4 SENT Landfill (since 1995) and SENT Landfill Extension (SENTX) (since 2022) were identified adjacent to the northeast and east of TKO 137. Based on the review of aerial photographs and site observations, the SENT Landfill / SENTX is approximately 10 m from TKO 137 and separated by an access road, vegetation and fences. SENT Landfill Extension (SENTX) is a Designated Project under EIAO with Environmental Permit, which comprises an impermeable leachate containment system to prevent off-site migration of leachate. Leachate, effluent and groundwater monitoring has been conducted under the EM&A programme to monitor the leachate levels, effluent and groundwater quality and to check / rectify any exceedances on site. Therefore, off-site contamination associated with the SENT Landfill / SENTX is not anticipated.

8.5.2.5 A temporary explosive magazine site (year 2013) was identified adjacent to the southeast of TKO 137, which was demolished by year 2022 and replaced by the works area of WSD for development of the desalination plant. Based on the findings of Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR) for the temporary explosive magazine site under Agreement No. CE8/2015 (WS) First Stage of Desalination Plant at Tseung Kwan O – Investigation, Design, Construction[1], no land contamination was identified for the temporary explosive magazine site. Therefore, no off-site contamination associated with the temporary explosive magazine site is anticipated.

TKO 132

8.5.2.6 A summary of the historical land uses is presented in **Table 8.2** below.

[1] Black & Veatch Hong Kong Limited, Contamination Assessment Plan (CAP) & Contamination Assessment Report (CAR) under *Agreement No. CE8/2015 (WS) First Stage of Desalination Plan at Tseung Kwan O – Investigation, Design and Construction*, February 2017

Table 8.2 Summary of Historical Land Uses for TKO 132

Year	Reference of Aerial Photos in Appendix 8.1 (Photo Reference Number)	Site Description
1963	703-704 (#1963-1170, 1963-5234, 1963-5246, 1963-5863, 1963-6079)	The site was mainly occupied by natural terrain and open water. Squatters and reclaimed land were observed adjacent to the northern part of the site.
1977	707-708 (#20393, 20395, 20397)	A foundry was observed adjacent to the northwest of the site. No other significant land uses changes were observed.
1986	711-712 (#A04259, A04260, A04261, A06405)	The northern part of the site was reclaimed and partially encroached into a foundry. No other significant land uses changes were observed.
1995	715-716 (#CN09506, CN12621)	The existing Junk Bay Chinese Permanent Cemetery was observed adjacent to the northwest of the site. No other significant land use changes were observed.
2004	719-720 (#CW55788, CW55855, CW59010, CW59045)	The northern part of the site was further reclaimed. The foundry was redeveloped into the existing Chui Ling Road and vacant / vegetated land within the site, and residential buildings (Ocean Shores) adjacent to the northwest of the site. The squatters adjacent to the north of the site were redeveloped into the existing King Ling Road and Tiu Keng Leng Station. The construction site for the existing residential development (Metro Town) was also observed. No other significant land uses changes were observed.
2013	723-724 (#CS44649, CS44650, CS44747, CS44923)	The existing access road to Junk Bay Chinese Permanent Cemetery was observed in the northwest of the site. Existing Tong Yin Street was observed in the north of the site. Residential buildings (Metro Town) were observed adjacent to the north of the site. No other significant land uses changes were observed.

Year	Reference of Aerial Photos in Appendix 8.1 (Photo Reference Number)	Site Description
2022	727-728 (#E167003C, E172381C, E172451C, E172454C, E172526C, E172528C, E172600C, E172601C)	The vacant / vegetated land was converted into a works area for Road P2 associated works. The existing Tseung Kwan O Interchange and Tseung Kwan O – Lam Tin Tunnel of Tseung Lam Highway was observed in the north of the site. Road P2 of Tseung Lam Highway on new reclaimed land was also observed in the north of the site. No other significant land uses changes were observed.

Source of aerial photographs: Survey and Mapping Office, Lands Department

8.5.2.7 Based on the review of aerial photographs, the Project area had been mainly occupied by non-contaminating land uses including natural terrain, open water, roads and vacant / vegetated land. No potential land contamination issues associated with these past land uses were identified.

8.5.2.8 A former foundry was observed from year 1977 to 2004 which was encroached into the northern portions of the Project area. The encroached areas appeared to be used as ponds and open storage. The foundry was demolished by 2004 and subsequently redeveloped into the existing residential buildings (Ocean Shores), vacant / vegetated land, Tseung Lam Highway Garden, Chui Ling Road and Tseung Lam Highway. Considering the foundry was redeveloped over 20 years ago, contaminated soil, if any, was expected to have been removed during the redevelopment. In addition, there were no evidence of land contamination (e.g. oil stains, stressed vegetation, chemical storage, chemicals waste producer (CWPs), dangerous good (DG), and chemical spillage / chemical leakage / fire incidents records) associated with the past operation of the foundry (refer to **Section 8.5.4**). Therefore, no potential land contamination issue associated with this former foundry to the Project is anticipated.

8.5.2.9 A works area for Road P2 associated works was observed in the north of TKO 132 in year 2022. Based on the site walkover conducted on 6 September 2024, the construction works had been completed and the existing Tseung Lam Highway Garden was observed (refer to **Section 8.5.5.4**). Given the construction works was temporary and no potential land contamination issues (e.g. oil stains, stressed vegetation, chemical spillage / leakage records) were identified, no potential land contamination issue associated with this works area to the Project is anticipated.

8.5.2.10 Following from the above, no potential contamination issues associated with historical land uses were identified within TKO 132.

8.5.3 Site Geology and Hydrogeology

General

8.5.3.1 The available geological information in the Geotechnical Appraisal Report for the Project was reviewed and the relevant ground investigation (GI) records are provided in **Appendix 8.2.**

TKO 137

Superficial Geology

8.5.3.2 The seabed at the berth box of TKO 137 is generally covered by 0 m to 5 m fill which consists of mainly sand or gravel/cobble material (inferred as filled dredge trench of seawall foundation) occasionally with some silt/clay. The thickness of fill increases significantly towards the existing seawall to up to 17m.

8.5.3.3 The existing reclaimed land of Fat Tong O is underlain by fill which consists of sand, cobble and boulder are ranging from 7m from to 30 m thick near the existing seawall based on more recent GI carried out after completion of reclamation. Fill is also present in offshore GI stations along the existing seawall at Fat Tong O.

8.5.3.4 As revealed by existing GI data, the marine deposit (MD) at TKO 137 is of mainly very soft to soft, dark grey to greenish grey, silt/clay and thin layer of marine silt / sand lenses, underlying the fill or at the seabed with a thickness up to 38 m. The base level of MD is ranging from approximately -10 mPD to -50 mPD.

8.5.3.5 At the existing reclaimed land of Fat Tong O, marine deposit with contrasting consistency (i.e. soft to stiff) are recorded across the site. The older existing GIs (i.e. carried out before completion of reclamation) recorded mainly soft to firm marine clay, occasionally interbedded with medium dense to dense sand. The more recent existing GIs (i.e. carried out after the completion of reclamation) recorded mainly medium dense to dense sand and locally firm to stiff marine clay. The thickness of MD at inland of Fat Tong O ranges from 0 m to 40 m.

8.5.3.6 Approximately up to 30 m thick alluvium is encountered beneath the MD, and sometimes directly beneath the fill material (probably due to dredging for construction of seawall). The layer generally comprises of highly variable interbedded layers of mixtures of clay/silt/sand with some with gravel and cobble near the bottom. The thicker bed of alluvium appears to be concentrated at the centre part of proposed reclamation and Fat Tong O, the former bay area between Fat Tong Chau and Tin Ha Au. The base level of alluvium is ranging from approximately 22 to 54mPD. Locally, interbedded MD and alluvium layers are found from GIs.

8.5.3.7 Colluvium is recorded at the hillside GI at Fat Tong Chau and is deposited locally above the Saprolite layer. The soil material is composed of matrix of sand, gravel, cobbles and boulders. Along the natural hillslope in the Clear Water Bay Country Park, the soil strata is mainly underlain by Saprolite with Colluvium cover on top. The colluvium is consisted of silt, sand, gravel, cobble and boulder, which the thickness can be up to 4.5m.

Solid Geology

8.5.3.8 According to the existing GI information, the majority of the rock encountered in the GI is tuff / eutaxite. Trachydacite is encountered in a number of GIs in the Clear Water Bay Country Park. Granite is mainly encountered in the northern Fat Tong Chau in some

boreholes. A minor intrusion of quartz syenite, monzonite, rhyolite and basalt are also identified in the eastern part of TKO 137, and Clear Water Bay Country Park Area.

8.5.3.9 The in-situ materials which is defined as partially weathered rock of any decomposition grade (while in-situ soils is basically the grade VI to IV materials), is encountered at all existing GIs, except vibrocores that terminated at shallow depth. At the proposed reclamation area, the thickness ranges from 0.5m to 32m, and the strata top can be reached deeper than -53mPD near the existing seawall.

Hydrogeology

8.5.3.10 In Fat Tong Chau, the available ground monitoring records indicate that the groundwater table is approximately at 3m to 13m below ground level. However, some of the piezometers on the eastern man-made slope were installed before site formation, and the groundwater level may be higher than present groundwater table. Furthermore, some available records cover seven-day monitoring periods only and as such, the seasonal response of groundwater to rainfall is not known.

8.5.3.11 In Clear Water Bay Country Park, the available ground monitoring records indicate that the groundwater table is approximately at 6m to 18m below ground level. As all the piezometers all the hill range are dry, the groundwater level on upper slope of natural terrain is unknown. Furthermore, most of the available records cover seven-day monitoring periods only.

8.5.3.12 The groundwater table at the proposed reclamation land is inferred to be similar to the sea and tidal levels.

<u>TKO 132</u>

Superficial Geology

8.5.3.13 Fill is encountered locally at TKO 132, with thickness ranging from 0.2 m to 9 m. The fill recorded typically consist of loose to very dense sand, with some gravels of rock, shell, coral & occasional tile, plastic fragments and in places cobbles, locally with very soft to clay/silt. It should, however, be noted that some of the vibrocores were terminated at shallow depth due to encountering hard materials, especially for those located closer to the shoreline, which may be related to the relatively shallow rockhead, deposit of rock material from the outcrops of nearby rocky shore or hard material from previous dumping material in related to the former dumping area in the vicinity. Disturbed marine deposit is encountered above the fill layer and are treated as fill clay. The records of fill in the offshore marine GI maybe due to the site is partially within former dumping area and/or related to the construction of Cross Bay Link. The fill is mostly encountered at the southern portion of the reclamation area.

8.5.3.14 Occasional beach deposit (BD) of thickness ranging from 0.36 m to 1.9 m is recorded in existing GI located along the shoreline of TKO 132. The BD, where encountered, typically consists of fine to coarse sand with gravel sized coral and shell fragments.

8.5.3.15 As revealed by existing GIs and geophysical survey, the marine deposit which is predominantly very soft to soft, dark grey to greenish grey, silt/clay and thin layer of marine silt / sand lenses with shell fragments is present on the seabed or beneath fill. The base level of marine deposit is ranging from approximately -4 mPD to -31 mPD, with thickness

increasing towards offshore. The cohesive dominant portions generally appear more extensive vertically and horizontally than the granular dominant portions.

8.5.3.16 At TKO 132, approximately up to 26 m thick alluvium is recorded beneath MD. The layer is typically described as soft to stiff clay/silt and medium dense to dense sand with occasional organic matter. Estuarine deposit is recorded locally as silty clay with occasional wood fragments, organic matters and gravels. The two soil types are generally grouped and inferred as a single unit due to their similar soil properties. The base level of alluvium is ranging from approximately -4 mPD to -47 mPD, gradually dipping to SW direction to offshore area.

8.5.3.17 At TKO 132 and site formation area, colluvium is locally recovered near the shore of Chiu Keng Wan Shan as gravel, cobble and boulder with thickness from at least 0.5 m to 2.19 m.

Solid Geology

8.5.3.18 Solid geology recorded in the available existing GI generally include saprolite (grade IV and grade V material) and rock of granite and tuff and locally with residual soil. Rock outcrops and flat rocks are observed along the shoreline which suggest shallower rockhead or in-situ soils at those areas. Based on geophysical survey, the presumed moderately decomposed rock contour reveals outcrop is present at the middle portion of the proposed reclamation.

8.5.3.19 In-situ soils are absent located in some of the GI, such as superficial deposit is directly underlain by moderately strong bedrock. Where in-situ soils are encountered, the thickness between the top of in-situ materials and rockhead ranges from about 0.11m to 12.44m. The thickest in-situ soil encountered is at the southwest end of proposed breakwater.

Hydrogeology

8.5.3.20 The proposed reclamation, breakwater and marine viaducts Sites are generally located offshore. The water level of the proposed reclamation should be referred to the sea tidal level of the area.

8.5.3.21 No existing groundwater monitoring record is found at the hillside.

8.5.4 Information from Government Departments

8.5.4.1 The EPD and FSD were contacted for (i) records on any chemical leakage / spillage, (ii) records of DG, (iii) records of chemical waste producer(s) (CWP(s)) and (iv) records of reported incidents within the Project area. Replies from EPD and FSD on the requests have been received and attached in **Appendix 8.3**. The information is summarized below.

Environmental Protection Department

8.5.4.2 Based on the replies given by EPD on 5 December 2023, there is no record of spillage / leakage of chemicals within the Project area.

8.5.4.3 Further to the EPD's reply, visit to EPD's Southorn Centre Office was undertaken on 8 February 2024, 12 September 2024 and 17 October 2024 to review the available CWP records. Based on the records reviewed, a total of 12 valid and 9 invalid CWP records were found within TKO 137, and 4 valid and 1 invalid CWP records were identified within TKO 132. The details are summarised in **Table 8.3** below and locations of the CWPs are indicated in **Figure 8.1** and **8.2**.

Table 8.3 Summary of Chemical Waste Producers within the Project Area

CWP ID	Status	Company Name	Address	Business Nature	Types of Chemical Waste
TKO 137					
1	Valid	Sang Hing Civil Contractors Co Ltd	Construction site of Temporary Construction Waste Sorting Facilities, Tseung Kwan O Area 137, Wan Po Road, Tseung Kwan O, N.T. (CEDD Contract No. CV/2016/04)	Construction	Spent lubrication oil^
2	Valid	Tapbo-Sang Hing Joint Venture	Construction Site for Temporary Construction Waste Sorting Facilities (2022-2025), Tseung Kwan O Area 137, Tseung Kwan O, N.T. (CEDD Contract No.: CV/2022/02)	Civil engineering construction	Spent diesel and spent lubricant oil^
3	Valid	Paul Y.-CREC Joint Venture	Area 137, Tseung Kwan O, New Territories	Construction	N/A#
4	Valid	Keppel Seghers-Zhen Hua Joint Venture	Construction Site for Integrated Waste Management Facilities Phase I of Sorting Facilities at Tseung Kwan O Area 137 Fill Bank, Possession of Portion 8 of the Site, Tseung Kwan O, N.T. (EPD Contract No.: EP/SP/66/12)	Miscellaneous civil engineering works	N/A#
5	Valid	Chun Wo-CRGL Joint Venture	Tseung Kwan O Area 137 - Public Fill Sorting Facility, Wan Po Road, Tseung Kwan O, NT (CEDD Contract No.: HK/2009/02)	Construction	N/A#
6	Valid	ZHEC - CCCC - CDC Joint Venture	Area A7a and Area A7c Fill Bank of Tseung Kwan O Area 137, Tseung Kwan O, N.T.	Site formation, filling materials sorting facilities	N/A#
7	Valid	Concentric - Sheung Moon Joint Venture	Temporary Construction Waste Sorting Facilities, Tseung Kwan O Area 137, Tseung Kwan O, N.T.	Construction waste sorting facilities	N/A#
8	Valid	Build King - SCT Joint Venture	Eastern side of Tseung Kwan O Area 137, Tseung Kwan O, N.T. (CEDD Contract No. NL/2017/03)	Civil engineering construction	N/A#

CWP ID	Status	Company Name	Address	Business Nature	Types of Chemical Waste
9	Valid	China Harbour Engineering Company Limited	Construction Site for Handling of Surplus Public Fill (2022-2023) at Tseung Kwan O Area 137 Fill Bank, Wan Po Road, Tseung Kwan O, N.T. (CEDD Contract No. CV/2021/09)	Civil engineering construction	Spent battery cell containing heavy metals and spent lubricating oil*
10	Valid	China Harbour Engineering Company Limited	Works Area At Tseung Kwan O Fill Bank, Tseung Kwan O Area 137, Wan Po Road, Tseung Kwan O, N.T.	Construction	N/A#
11	Valid	China Harbour - Zhen Hua Joint Venture	Tseung Kwan O Area 137 Fill Bank, Wan Po Road, Tseung Kwan O, N.T. (CEDD Contract No. CV/2015/07)	Handling of surplus public fill	Spent battery cell containing heavy metals and spent lubricating oil^
12	Valid	Cheery City Contractors Limited	Construction Site at Area 137 at South of Fat Tong Chau, Tseung Kwan O, N.T.	Civil engineering & marine engineering	N/A#
13	Invalid	Paul Y.-CREC(HK) Joint Venture	Area 137, Wan Po Road, Tseung Kwan O, New Territories	Construction	N/A#
14	Invalid	Gammon Skanska Limited	CED Contract No. CV/2002/04, Penny's Bay Reclamation Stage 2, Area 137, Public Fill Sorting Facility, Tseung Kwan O	Civil construction works	N/A#
15	Invalid	China Harbour Engineering Company Limited	Tseung Kwan O Area 137, Sai Kung, New Territories	Operation of material handling	Spent lubricating oil, spent flammable liquid, spent battery and surplus paint^
16	Invalid	Penta-Ocean Construction Co Ltd Hong Kong Branch	Fill Bank, Area 137, Tseung Kwan O, Sai Kung, New Territories	Building and construction	Spent lubricating oil, solvent and battery, surplus paint bank and fuel, contaminated soil and empty chemical containers^

CWP ID	Status	Company Name	Address	Business Nature	Types of Chemical Waste
17	Invalid	China Harbour Engineering Company Limited	Construction Site of Tseung Kwan O Area 137, Temporary Construction Waste Sorting Facilities, Wan Po Road, Tseung Kwan O	Construction	Spent lubricating oil, spent flammable liquid, spent battery containing heavy metals and surplus paint^
18	Invalid	PAUL Y. - CCECC Joint Venture	Area 137 Tseung Kwan O	Construction	Spent lubricating oil^
19	Invalid	China Harbour - China State Joint Venture	Tseung Kwan O Area 137 Fill Bank, Wan Po Road, Tseung Kwan O, New Territories	Construction	Spent lubricating oil, spent flammable liquid, spent battery containing heavy metals and surplus paint^
20	Invalid	Sang Hing Civil Contractors Company Limited	Tseung Kwan O Area 137 - Temporary Construction Waste Sorting Facilities (2011-2013), Wan Po Road, Tseung Kwan O, NT (CEDD Contract No. CV/2010/05)	Construction	N/A#
21	Invalid	HKPFH Joint Venture	Construction Site of Tseung Kwan O Area 137 Fill Bank, Wan Po Road, Tseung Kwan O, N.T.	Construction	Spent lubricating oil and spent battery^
TKO 132					
22	Valid	CRBC - Build King Joint Venture	Construction Site of Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works, Tseung Kwan O, N.T. (Contract No. NE/2015/02)	Civil construction	N/A#
23	Valid	Leighton - China State Joint Venture	Construction Site of Tseung Kwan O - Lam Tin Tunnel - Main Tunnel and Associated Works, Tseung Kwan O interchange, Tseung Kwan O, N.T. (Contract No. NE/2015/01)	Construction	N/A#
24	Valid	Zhen Hua Engineering Company Limited	Construction Site of Tseung Kwan O - Lam Tin Tunnel - Road P2/D4 and Associated Works, Tseung Kwan O, N.T. (CEDD Contract No. NE/2017/02)	Construction	N/A#

CWP ID	Status	Company Name	Address	Business Nature	Types of Chemical Waste
25	Valid	Chun Wo Construction &. Engineering Co Ltd	Construction Site of "Infrastructure Works at Town Centre South and Tiu Keng Leng". Tseung Kwan O. N.T. (CEDD Contract No. TK/2009/01)	Infrastructure Works	N/A[#]
26	Invalid	China Civil - Road & Bridge Joint Venture	Construction Site of TKO Development PH. 3 – Remaining Reclamation in Town Centre Extension Stage 2 & Associated Main Drainage Works NT	Construction	N/A[#]

Remark:

*Based on the information observed during site walkover.

^Based on the information from EM&A reports of corresponding contracts on the EIAO website (https://www.epd.gov.hk/eia/english/register/aep/ep1342002_index.html).

[#]N/A: Not Applicable. The type of chemical waste is not known based on the information from site walkover, EPD and / or EM&A reports of corresponding contracts on the EIAO website.

TKO 137

8.5.4.4 CWP ID 1, 2, 3, 7, 13, 17 and 20 are/were likely to be associated with the construction of the existing TKOSF within the Project area. The sorting facilities have been occupied with the site for at least 19 years and the CWP records are consecutive for the construction / operation of the sorting facilities. Based on the site walkover, a designated chemical storage cabinet for the storage of lubricating oil buckets was observed in the south of TKO 137 (refer to Dwg. No. 60720423/B30/739 in **Appendix 8.4**). The chemical storage cabinet was observed to be in good condition with no signs of oil stains / chemical spillage / stressed vegetation noted in the vicinity. Given that there were no signs of spillage / stains / stressed vegetation observed in the vicinity of the designated chemical waste storage cabinet and there have been regular site walks by the Environmental Team (ET) and verified by Independent Environmental Checker (IEC) to monitor the chemicals handled and to check and rectify any spillage on site (refer to **Table 8.4**), no potential land contamination issues associated with these CWPs are anticipated.

8.5.4.5 CWP ID 9, 10, 11, 15, 16, 18, 19 and 21 are associated with the construction and handling of surplus public fill of TKOFB within the Project area. TKOFB has been occupied with the site for at least 22 years and the CWP records are consecutive for the construction / operation of the fill bank. Based on site observation, a designated chemical waste storage cabinet for the storage of spent lubricating oil was observed in the north of TKO 137 (refer to Dwg. No. 60720423/B30/733 & 735 in **Appendix 8.4**). The chemical waste storage cabinet was observed to be in good condition with no signs of oil stains / chemical spillage / stressed vegetation noted in the vicinity. Given that there were no signs of spillage / stains / stressed vegetation observed in the vicinity of the designated chemical waste storage cabinet and there have been regular site walks by the ET and verified by IEC to monitor the chemicals handled and to check and rectify any spillage on site (refer to **Table 8.4**), no potential land contamination issues associated with these CWPs are anticipated.

8.5.4.6 CWP ID 6 is likely to be associated with the operation of the sorting facilities for reclamation works under HKIA – Three Runway System Project – Main Reclamation Works (Contract No.: 3206) (3RS Site). Based on the site walkover and information provided by the site representatives, chemical waste produced on-site are temporary stored at the designated chemical waste storage container located in the west of TKO 137, and no signs of spillage / stains / stressed vegetation were observed in the vicinity of the designated chemical waste storage container (refer to Dwg No. 60720423/B30/736 in **Appendix 8.4**). In addition, there have been regular site walks by the ET and verified by IEC to monitor the chemicals handled and to check and rectify any spillage on site (refer to **Table 8.4**) Therefore, no land contamination issues associated with this CWP to the Project are anticipated.

8.5.4.7 CWP ID 4, 5, 8 and 14 were likely to be associated with the operation of the sorting facilities for reclamation works under EPD Contract No. EP/SP/66/12 Integrated Waste Management Facilities, Phase I, CEDD Contract No. NL/2017/03 Tung Chung New Town Extension – Reclamation and Advance Works, CEDD Contract No. HK/2009/02 Wan Chai Development Phase II – Central – Wan Chai Bypass at Wan Chai East and CEDD Contract No. CV/2002/04 Penny's Bay Relocation Stage 2 within the TKOFB. As reported by site representative of TKOFB, the sorting facilities for these contracts had been decommissioned, hence, the CWPs registration is likely to be inactive and no relevant sorting facilities / chemical waste storages / stains or spillage were observed during the site walkover. In addition, there had been regular site inspections conducted by the ETs and verified by IECs under the Environmental Monitoring & Auditing (EM&A) programme to monitor the chemicals handled and to check and rectify any spillage on site. The storage

of chemical wastes associated with these CWPs were unlikely to have caused any land contamination issues to the Project.

8.5.4.8 CWP ID 12 is associated with the construction site at TKO 137. Given that the CWP registration is likely to be inactive as no construction site and land contamination issues were observed at TKO 137 during the site walkover, potential land contamination issue associated with this CWP record to the Project is not anticipated.

TKO 132

8.5.4.9 CWP ID 22 to 24 are associated with the construction of the existing Tseung Kwan O – Lam Tin Tunnel. The construction works had been completed and no construction sites were observed within TKO 132 during the site walkover. Based on the latest engineering design, the existing Tseung Kwan O – Lam Tin Tunnel will be retained and no excavation works would be anticipated under the Project. In addition, the construction of the Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works is Designated Projects under EIAO with respective Environmental Permits. There had been regular site inspections by the ET and verified by IEC under the EM&A programme to monitor the chemicals handled and to check and rectify any spillage on site. Potential land contamination issues associated with these CWPs records to the Project are not anticipated.

8.5.4.10 CWP ID 25 was associated with the construction site under CEDD Contract No.TK/2009/01 Infrastructure Works at Town Centre South and Tiu Keng Leng, Tseung Kwan O. The construction works under this contract were completed at least 10 years ago and no construction site, chemical / chemical waste storages / stain or spillage were observed at TKO 132 during the site walkover (refer to **Section 8.5.5.4** for details). Given the nature of construction site which does not typically involve extensive contaminating activities (e.g. refueling / machinery maintenance) and no evidence of land contamination (e.g. oil stains, stressed vegetation, chemical storage, chemical spillage / leakage / fire incidents records from EPD and FSD) was identified, potential land contamination associated with this CWP record to the Project is not anticipated.

8.5.4.11 CWP ID 26 was associated with the construction site under Territory Development Department (TDD) Contract No. TK45/2000 Tseung Kwan O Development Phase 3 Remaining Reclamation in the Town Centre Extension, Stage 2 and Association Main Drainage Works. The CWP record is likely to be inactive as the construction works under this contract were completed at least 20 years ago. Based on findings of the site walkover, there were no construction site / chemical / chemical waste storages, stain or spillage observed at TKO 132 (refer to **Section 8.5.5.4** for details). Given the nature of construction site which does not typically involve extensive contaminating activities (e.g. refueling / machinery maintenance) and no evidence of land contamination (e.g. oil stains, stressed vegetation, chemical storage, chemical spillage / leakage / fire incidents records from EPD

and FSD) was identified, potential land contamination associated with this CWP record to the Project is not anticipated.

Fire Services Department

8.5.4.12 Based on the replies from FSD on 9 January 2024, no DG license record was identified within the Project area.

8.5.4.13 Furthermore, a total of 136 incident records were reported by the FSD. The details of the incident records are shown in **Appendix 8.3** and the locations of the incident occurrences were shown in **Figure 8.3 to 8.5**.

8.5.4.14 As shown in **Figure 8.3 to 8.5**, all the 136 incidents occurred outside the Project area. Thus, these incidents are not expected to pose any potential land contamination issues to the Project.

8.5.5 Site Reconnaissance

8.5.5.1 Site walkovers were conducted on 19 and 22 February 2024, 11 and 19 March 2024, 6 September 2024 and 16 October 2024 to investigate any contaminative issues associated with current land uses and activities within the Project area. Findings of the site walkover, including the photographic records and site layout plan, are shown in **Appendix 8.4**. Questionnaire surveys were conducted with available site representatives and the site walkover checklists are provided in **Appendix 8.5**.

TKO 137

8.5.5.2 The TKO 137 is mainly occupied by the existing Tseung Kwan O Area 137 Fill Bank (TKOFB), Tseung Kwan O Sorting Facilities (TKOSF), WSD site office and construction materials storage under Contract No. 13/WSD/17 (WSD Site), Sorting Facilities in Tseung Kwan O Area 137 Fill Bank under Contract No. 3206 (3RS Site), skips storage and skip lorries parking area (Site S1) and the construction site of concrete batching plant and transformer room (Site S2). Findings of the site walkover for these surveyed sites are summarized in **Table 8.4**. Locations of the surveyed sites and the corresponding photographic records are shown in **Appendix 8.4**.

8.5.5.3 The remaining portions of the Project area at TKO 137 consist of natural terrain, vegetated land / vacant land and slopes, Wan Po Road, access road and barging point of TKOSF. No potentially contaminating land uses / activities (e.g. vehicle maintenance / refueling activities) were observed in these areas during the site walkover.

TKO 132

8.5.5.4 Based on the site walkover, the Project area was mainly occupied by non-contaminating land uses including roads (e.g. Tseung Lam Highway, Tseung Kwan O Interchange, Tseung Kwan O – Lam Tin Tunnel, Road P2, Chui Ling Road, Tong Yin Street and access roads), cycling track, Tseung Lam Highway Garden, vegetated land / slope, vacant land, village houses and graves (refer to Dwg. No. 60720423/B30/740 in **Appendix 8.4**). No potentially contaminating land uses / activities (e.g. vehicle maintenance or refuelling) were observed in these areas during the site walkover.

8.5.5.5 The Road P2 Stormwater Plant Room Substation was observed within the existing Tseung Lam Highway Garden. Based on the latest engineering design plan, the substation will be retained and no works will be carried out at the substation under the Project. Based on the site walkover, no oil stains / spillage, stressed vegetation or potentially contaminating land

uses / activities (e.g. vehicle maintenance or refuelling) were observed in the vicinity of the substation (refer to Dwg. No. 60720423/B30/740 in **Appendix 8.4**).

8.5.6 Summary of Site Appraisal

TKO 137

8.5.6.1 Based on findings of the site appraisal, a total of 2 areas with potential land contamination concerns (i.e. an oil stain at the skips storage and skip lorries parking area (Site S1) and the future concrete batching plant and transformer room (Site S2)) were identified within TKO 137. Locations of the concerned sites are shown in **Figure 8.6** and details of these sites are summarized in **Table 8.4**.

8.5.6.2 Intrusive site investigation (SI) works is considered necessary to confirm any land contamination within the skips storage and skip lorries parking area (Site S1). The corresponding sampling and testing strategies are presented in **Section 8.6**.

8.5.6.3 For the future concrete batching plant and transformer room (Site S2), further site appraisal should be carried out after decommissioning of the plant but prior to construction works of the Project to identify the presence of any potential contamination sources (refer to **Section 8.8** for details).

TKO 132

8.5.6.4 Based on findings of the site appraisal, no potential land contaminating land uses / activities were identified within TKO 132.

8.5.7 Future Land Use

8.5.7.1 Land contamination assessment on the potentially contaminated sites would need to be evaluated against the RBRGs and if there were presence of non-aqueous phase liquid (NAPL), soil saturation (C_{sat}) / solubility limits, as stipulated in Table 2.1 and Table 2.2 of the Guidance Manual.

8.5.7.2 The RBRGs were developed based on a risk assessment approach to suit the local environmental conditions and community needs in Hong Kong. Decisions on contaminated soil and groundwater remediation are based on the nature and extent of the potential risks that are posed to human receptors as a result of exposure to chemicals in the soil and/or groundwater. RBRGs were developed for four different land use scenarios as below reflecting the typical physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater:

- Urban Residential
- Rural Residential
- Industrial
- Public Park

8.5.7.3 Based on the Recommended Outline Development Plan (RODP) of the Project, the recommended future land use of Site S1 would include open space and that of Site S2 would include open space and private housing. Where a site would be developed into more than one land use, the most stringent set of RBRGs would be adopted. As such, the RBRGs land use scenarios for Public Park and Urban Residential are considered appropriate for the assessment of Site S1 and Site S2 respectively. Should there be any changes in the future land use, the adopted RBRGs will be reviewed and presented in the Contamination

Assessment Plan (CAP) to be submitted to EPD for approval (refer to **Section 8.8.1** for details).

8.5.7.4 The proposed RBRGs land use scenarios recommended for this Project are summarised in **Table 8.4**. Relevant RBRGs are shown in **Appendix 8.6**.

Table 8.4 Summary of Potential Land Contamination Issues within the Project Area

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
Tseung Kwan O Area 137 Fill Bank (TKOFB) (Lot No. GLA-TSK 692 Tseung Kwan O Area 137)	Temporary stockpiling and crushing of fill materials	The public fill reception facilities under Contract No. *CV/2021/09 Handling of Surplus Public Fill (2022-2023) – Tseung Kwan O Area 137 Fill Bank* is located at TKO 137, which is currently operated by the CEDD and China Harbour Engineering Company Limited (contractor). The site mainly comprises a car park, ancillary facilities (e.g. wheel washing bay, wash house, combined reception and exit offices), a site office in the north, tipping halls and a crushing plant and a weighing point and recorder house in the west, and the stockpiling area for fill materials in the remaining areas of the site. The site is largely unpaved except for the site office and ancillary facilities in the northern portion. Based on site observation and as reported by the site representative, a DG store containing compressed oxygen and acetylene cylinders and a chemical waste cabinet containing spent lubricating oil were observed in the northeast of TKOFB (refer to Photo 7507 and 7510 in **Appendix 8.4**). Oxygen and acetylene are gaseous compounds which would not lead to land contamination. No signs of stains / spillage / stressed vegetation were observed in the vicinity of the DG store and chemical waste cabinet. A crushing plant is located in the west of TKOFB, which was inaccessible for detailed site walkover. Temporary storage of lubricating oil buckets was observed outside the crushing plant (refer to Photo 8339 in **Appendix 8.4**), which were reportedly empty. The lubricating oil buckets were stored on metal plates and rubber sheets with no oil stains observed in the vicinity. Lubricating oil and diesel are reportedly used for operation of the crushing plant and the generator near the crushing plant with on-site refueling as needed. Based on site observation, the generators near the crushing plant and site office were observed on concrete slabs with no signs of stains / spillage / stressed vegetation noted in the vicinity the generators (refer to Photo 8320 and 8341 in **Appendix 8.4**). According to the site representative, the site is Designated Project under EIAO with Environmental Permit. Weekly inspection by the ET is conducted under Environmental Monitoring & Auditing (EM&A) programme to monitor the chemicals handled and to check / rectify any spillage on site. Chemical spillage drilling and emergency procedures for major chemical / adhesive / oil spillage are also provided for the site workers. Based on information from EPD, FSD and site representative, there were no DG / fire incident / chemical spillage records for the site. There were 3 valid (CWP ID 9, 10 & 11) and 5 invalid (CWP ID 15, 16, 18, 19 & 21) CWP records associated with construction and handling of surplus public fill for the site.	Photo 6134, 6451, 6521, 6567, 7507, 7510, 8320 & 8398 in Dwg. No. 60720423/B30/733; Photo 6244, 8339, 8341 & 8437 in Dwg. No. 60720423/B30/735; Photo 5122 in Dwg. No. 60720423/B30/737 and Photo 7627 in Dwg. No. 60720423/B30/739	N/A	735,000	**No** Given that weekly inspection by the ET is conducted under EM&A programme to monitor chemicals handled and to check and rectify any spillage on site, the generators were observed on concrete slabs and no signs of oil stains / spillage / stressed vegetation was observed on site during the site walkover, potential land contamination issues associated with operation of the site to the Project are not anticipated.	N/A	N/A

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
Tseung Kwan O Area 137 Construction Waste Sorting Facilities (TKOSF) (Portion A: Lot No. GLA-TSK 745 and Portion B: Lot No. GLA-TSK 692))	Construction waste sorting facilities and site office	The construction waste sorting facilities under *Contract No. CV/2022/02 Temporary Construction Waste Sorting Facilities (2022 – 2025)* is located at TKO 137. The site consists of 2 portions, namely Portion B in the north and Portion A in the southeast of TKO 137, which is currently operated by CEDD and Tapbo – Sang Hing Joint Venture (contractor). Portion B of the site mainly comprises 2 site offices and combined reception and exit office in the north, a recycling materials storage area in the west and a preliminary sorting area in the south. Based on site observations and as reported by the site representative, the recycling materials storage area was used for the temporary storage of recyclable non-inert waste (e.g. steel and plastic) from sorting of mixed construction waste (refer to Photo 7733 in **Appendix 8.4**). Portion A of the site mainly comprises a sorting facility and tipping hall in the west and a workers' rest container in the south of the site. Portion B and Portion A of the site are largely unpaved except for the recycling materials storage area, combined reception and exit office, site offices and main haul road in Portion B with no signs of oil stain, spillage or stressed vegetation observed during the site walkover. Based on site observations and as reported by the site representative, lubricating oils are stored in the chemical storage cabinet in the west of Portion A. A generator placed on unpaved ground in the center of Portion A and an oil drum provided with a drip tray above a concrete slab were observed next to the generator. As reported by the site representative, the generator is used on an as-needed basis only and is equipped with a built-in drip tray. The chemical storage cabinet, the generator, the drip tray and concrete slab under the oil drum were noted to be in good condition with no signs of stain, spillage or stressed vegetation observed (refer to Photo 5302, 7859 and 7850 in **Appendix 8.4**). According to the site representative, the site is Designated Project under EIAO with Environmental Permit. Weekly inspection by the ET is conducted under EM&A programme to monitor the chemicals handled and to check / rectify any spillage on site. Based on information from FSD, EPD and site representative, there were no DG / fire incident / spillage records for the site. There were 4 valid (CWP ID 1, 2, 3 and 7) and 3 invalid (CWP ID 13, 17 and 20) CWP records associated with construction of the construction waste sorting facilities.	Photo 7708, 7730, 7733, 7740 & 7789 in Dwg. No. 60720423/B30/734 and Photo 5302, 7832, 7859, 7850 & 7888 in Dwg No. 60720423/B30/739	N/A	52,100	**No** The drip tray and concrete slab under the oil drum, the generator with a built-in drip tray and the chemical storage cabinet were observed to be in good condition with no signs of stain / spillage were observed. Weekly inspection by the ET is conducted under EM&A programme to monitor chemicals handled and to check and rectify any spillage on site. Based on the above, no potential land contamination issues associated with operation of the site to the Project are anticipated.	N/A	N/A

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
WSD Site Office and Construction Materials Storage (WSD Site) (Lot No. GLA-TKS 3959)	Site office and construction materials storage	The site office and construction materials storage under *Contract No. 13/WSD/17 Design, Build and Operate 1st Stage of Tseung Kwan O Desalination Plant* is located in the east of TKO 137, which is currently operated by WSD and AJC Joint Venture (contractor). The site mainly comprises of site office in the northwest and southeast of the site, a workshop and a materials store in the southwest of the site, soil stockpiling area in the east of the site and construction materials storage in the remaining areas of the site. The site was concrete paved except for the construction materials storage and soil stockpiling area. Based on the site observations and as reported by the site representative, the workshop was used for small-scale repair and maintenance works on a needed basis only which involved the use of limited amount of chemicals (e.g. epoxy paints and paints), while the materials store was mainly used for the storage of Electrical and Mechanical (E&M) equipment (e.g. freezers, cables, pipe parts and fittings, electrical boxes and cabinets). The workshop was concrete paved with storage of construction materials including pipe parts and fittings, epoxy paints and paints observed (refer to Photo 8104 in **Appendix 8.4**). Based on site observations and as reported by the site representative, there are 2 Schedule 2 DG stores containing resin solutions and organic peroxide type D solutions located in the center of the site (refer to Photos 5701 and 5709 in **Appendix 8.4**). No stains / spillage / stressed vegetation in the vicinity of the DG stores. Based on the site walkover, epoxy paints and paints were observed inside the materials store, which were stored above wooden pallets on concrete paved floor (refer to Photo 8160 in **Appendix 8.4**). According to the site representative, these chemicals are mainly used in works area of Contract No. 13/WSD/17 with small quantities used in the workshop and temporarily stored on site only (refer to Photo 8104 in **Appendix 8.4**). Diesel oil drums were also observed above wooden pallets on concrete paved ground outside the materials store (refer to Photo 5900 in **Appendix 8.4**). The diesel oil drums were filled with diesel oil and temporarily stored on site. The diesel oil was reportedly used as fuel for the generator as needed. No chemical spillage or stains were observed in the vicinity of the storage area of the chemicals. The generator was observed on the concrete paved ground next to the diesel oil drums noted to be in good condition with no oil stain / spillage or stains observed in the vicinity (refer to Photo 8174 in **Appendix 8.4**). Based on information provided by WSD, monthly inspection is conducted to monitor chemical handling and to check and rectify any spillage on site, and there are no records of land contamination / chemical spillage / leakage for the site. According to email correspondence with WSD provided in **Appendix 8.3**, in accordance with Engineering Conditions of TGLA No.3959, the allocatee (i.e. WSD) shall ensure the site is free from contamination, and any	Photo 5701, 5709, 5900, 7949, 8174 & 8262 in Dwg. No. 60720423/B30/737 and Photo 8104, 8135, 8160, 8164, 8203, 8236 & 8270 in Dwg. No. 60720423/B30/738	N/A	44,700	**No** Given that there is no reported land contamination / chemical spillage / leakage, the workshop was concrete paved with limited use and storage of chemicals for small-scale repair and maintenance works on a needed basis only, the generator and chemical storages were on concrete paved ground in good condition with no stain / spillage observed, and allocatee (i.e. WSD) shall ensure the site is free from contamination at the expiry of the allocation, any land contamination arising from the site operation would have been remediated prior to the construction of the Project. Hence, no land contamination issues to the Project are anticipated.	N/A	N/A

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
		contamination substance should be removed before handing back to District Lands Office (DLO) at the expiry of allocation. Based on information from FSD and EPD, there were no CWP record / chemical spillage / DG / incident records for the site.						
Sorting Facilities in Tseung Kwan O Area 137 Fill Bank under Contract No. 3206 (3RS Site)	Operation of Sorting Facilities	The sorting facilities under *Contract No. 3206 – Main Reclamation Works for Expansion of Hong Kong Internation into A Three Runway System (3RS)* is located in the west of TKO 137, which is currently operated by Airport Authority Hong Kong (AAHK) and *ZHEC-CCCC-CDC Joint Venture* (Contractor). The site mainly comprises 2 sorting facilities in the north and south of the site, container offices, materials storage container and chemical storage container in the center and a tipping hall in the south of the site. The site is largely unpaved except for the tipping hall. Based on site observations and information provided by the site staff, chemicals identified on site include lubricant grease, hydraulic oil, antifreeze coolant, transmission oil and engine oil. These chemicals were reportedly used for daily site operation, which were observed to be stored inside the chemical storage container provided with metal corrugated sheets (refer to Photo 8875 in **Appendix 8.4**). Thinners in sealed metal cans and anti-corrosive paints were observed on the metal floor of the materials storage container (refer to Photo 7077 and 8661 in **Appendix 8.4**). Lubricant gear oil drums filled with lubricant gear oil were also observed on wooden pallets above concrete paved ground near the tipping hall (refer to Photo 7027 in **Appendix 8.4**) for temporary storage only. In addition, diesel oil was reportedly used for the generators and refueled directly to the tank of the generator from diesel truck as needed. The generators were observed to be situated on concrete slab / provided with drip trays above unpaved ground (refer to Photo 7013 and 8608 in **Appendix 8.4**). No signs of oil stains / spillage were observed on the concrete slab / drip trays and unpaved ground in the vicinity of the generators. The floors of the chemical storage container and the materials storage container, and the concrete paved ground were noted to be in good condition with no stains / spillage observed.	Photo 7027, 7077, 8661 & 8875 in Dwg. No. 60720423/B30/735 and Photo 0074, 6993, 7010, 7013, 7042, 8832, 8844 & 8608 in Dwg. No. 60720423/B30/736	N/A	23,900	**No** Given that there were no signs of stains / spillage observed in the vicinity of chemical storage areas, concrete slab and drip trays under the generators and the unpaved ground in the vicinity of the generators, and the oil stain observed near the engine oil drum had been properly removed in accordance with EM&A manual and spill response plan of 3RS Project and monthly inspection is conducted to monitor the chemicals handled and to check / rectify any spillage on site, no land contamination issues associated with operation of the site to the Project are anticipated.	N/A	N/A

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
		A chemical waste storage container was observed in the center of the site (refer to Photo 8844 in **Appendix 8.4**). Based on the site walkover and information provided by the site representatives, chemical waste produced on-site are temporarily stored in the designated chemical waste storage container, and no signs of spillage / stains / stressed vegetation were observed in the vicinity of the designated chemical waste storage container A patch of oil stain (approx. $3m^2$) was observed on compacted gravel ground near the engine oil drum in the center of the site, in which the substance was likely to be engine oil (refer to Photo 7010 in **Appendix 8.4**). However, as reported by the site representative on 26 March 2024, the oil stain had been immediately removed (refer to Photo 0074 in **Appendix 8.4**) using oil absorbent pads and dry sand to soak away the oil. The contaminated materials were placed inside a chemical waste disposal bag and stored in the chemical waste storage container for collection by licensed chemical waste collector. The oil stain removal was carried out in accordance with the EM&A manual and spill response plan of the 3RS Project. Given that the oil stain was properly removed immediately after the incident and that no residual oil was observed at the concerned location, contamination to the underlying soil (if any) is considered unlikely. Potential land contamination issue associated with the incident is therefore not anticipated. The site is Designated Project under EIAO with Environmental Permit. Monthly inspection is reportedly carried out by AAHK and the contractor under EM&A programme to monitor the chemicals handled and to check / rectify any spillage on site. Based on information from FSD, EPD and the site representative, there were no chemical spillage / DG / incident records for the site. There was 1 valid (CWP ID 6) CWP records associated with the operation of the site.						
Construction Site of Temporary Concrete Batching Plant and Transformer Room (Lot No. STTSK0061) (Site S2)	Construction site of temporary concrete batching plant and transformer room	The site is located in the northwest of TKO 137 and mainly comprises a work area for construction of the temporary concrete batching plant and transformer room, a construction materials storage area and container offices. Based on the site observation, the site is largely concrete paved except for the works area in the center of the site and the construction materials storage area in the west of the site. A generator provided with drip tray was observed on concrete slab in the works area. A diesel oil drum provided with drip tray was observed on unpaved ground next to the generator in the works area (refer to Photo 8776 in **Appendix 8.4**). The drip trays were observed to be in good condition with no signs of oil stain / spillage observed in the drip trays / concrete slab / unpaved ground in the vicinity of the diesel oil drum during the site walkover. Based on site observations and information provided by the site representative, apart from diesel oil for the generator, no other chemicals were identified / used on site. Given the storage of the diesel oil drum is temporary in nature for the construction works and as there is no signs of contamination (e.g. oil stain / spillage) observed in the	Photo 6804, 8529, 8769, 8776 & 8783 in Dwg. No. 60720423/B30/732	N/A	4,900	**To be confirmed** Given that the drip tray under the diesel oil drum was in good condition with no signs of stains / spillage observed in the drip tray / unpaved ground in the vicinity of the diesel oil drum, and the storage of the diesel oil drum is temporary in nature for the construction works, land contamination issue is not anticipated. In addition, concrete batching plant and transformer room are considered as contaminating land types according to the EPD Practice Guide, further site appraisal should be carried out after decommissioning of the future concrete batching plant has	Open Space and Private Housing	Urban Residential

Surveyed Site / Site ID (Affected Land Lot No. / Address)[1]	Current Land Use	Site Observation / Current Potentially Contaminating Activities / Information from EPD and FSD	Corresponding Photographic Record Reference in Appendix 8.4	Other Past Potentially Contaminating Land Use / Activities	Approx. Site Area (m^2)	Any Potential Land Contamination Issue?	Future Land Uses	RBRGs Land Use Scenario
		vicinity of the diesel oil drum, land contamination issue is not anticipated. Based on information from FSD and EPD, there were no CWP record / chemical spillage / DG / incident records for the site.				ceased but prior to the construction works of the Project to confirm any potential land contamination issue to the Project.		
Skips Storage and Skip Lorries Parking Area (Lot No. SX4788) (Site S1)	Storage of skips and parking of skip lorries	The site is located at northwest of TKO 137. The entire site is unpaved. Based on site observation and information provided by the site representative, storage of skips and parking of skip lorries were observed. No chemicals / oil storage or potentially contaminating activities (e.g. vehicle maintenance and refueling activities) were observed / reportedly carried out on site. A patch of oil stain (approx.10 m^2) was observed on the unpaved ground near a skip lorry in the center of the site (refer to Photo 7384 in **Appendix 8.4**). No other signs of oil stains / chemical spillages / potentially contaminating activities were observed on site. Based on information from FSD and EPD, there were no CWP record / chemical spillage / DG / incident records for the site.	Photo 7363, 7374, 7384, 9627, 9641 & 9665 in Dwg. No. 60720423/B30/731	N/A	4,700 • Oil stain (approx.10 m^2)	**Yes**	Open Space	Public Park

Note:

1. Refer to Dwg. No. 60720423/B30/730 in **Appendix 8.4** for the site locations.

N/A: Not Applicable

8.6 Site Investigation Plan

8.6.1 General

8.6.1.1 Based on findings of the site appraisal, intrusive SI works is considered necessary for 1 concerned area (Site S1) identified in TKO 137. For the future concrete batching plant and transformer room (Site S2), further site appraisal should be carried out after decommissioning of the plant but prior to construction works of the Project to identify the presence of any potential contamination sources and the need for SI works.

8.6.1.2 A total of 1 sampling location is proposed to study the vertical profile of possible contamination at Site S1. The proposed sampling location followed the EPD Practice Guide and has taken into account the sources of contamination (i.e. hotspots) identified during the site walkover. The key Chemicals of Concern (COCs) proposed for laboratory analysis include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals and petroleum carbon ranges (PCRs).

8.6.1.3 Details of the sampling and testing plan are shown in **Table 8.5** and the proposed sampling location is illustrated in **Figure 8.7**. The exact sampling location is subject to fine adjustment according to the actual site conditions and existence of underground structures/utilities as determined by the on-site land contamination specialist.

Table 8.5 Sampling and Testing Plan

Concerned Area[1]	Hotspot[1] (Approx. Area)	Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2][5]		Parameters to be Tested[3]			
							PCRs	VOCs	SVOCs	Metals
Skips Storage and Skip Lorries Parking Area (Site S1)	Oil stain (10 m^2)	ENV-BH01	Target the hotspot (oil stain) identified at the concerned area (approx.10 m^2)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl[4]	✓	✓	✓	✓

Note:

(1) Refer to **Figure 8.7** for concerned area and proposed sampling locations.
(2) bgl = below ground level; GW = groundwater
(3) The testing parameters refer to the parameters as shown in Table 2.1 – RBRGs for Soil & Soil Saturation Limit in the Guidance Manual.
(4) The deepest depth of sampling should be at groundwater table or 6m bgl, whichever is shallower.
(5) Since RBRGs values under Public Park land use scenario were not available for groundwater, no groundwater sampling and testing were proposed for Site S1.

8.6.2 Soil Sampling and Testing Method

8.6.2.1 All soil boring / excavation and sampling shall be supervised by a land contamination specialist.

8.6.2.2 Boreholes should be advanced by dry rotary drilling, i.e. without the use of flushing medium, to prevent cross-contamination during sampling. For safety reasons, an inspection pit should be excavated to 1.5m below ground level (m bgl) to confirm the absence of underground utilities at the proposed borehole location and disturbed soil samples, using stainless steel hand tools or other appropriate equipment, should be collected at depth of 0.5m bgl. Soil boring using drill rigs should then be performed from depth of 1.5m bgl to the maximum boring depth. Undisturbed U100/U76 soil samples should be collected at depths from 1.5m and onwards. Boreholes are proposed to be advanced to approximately 2m below the stabilized water table or if no groundwater were encountered, a depth of 6m bgl. On-site screening using photo-ionization detectors (PID) for measurement of VOC concentration in soil vapour will also be carried out to assist in the identification of potentially contaminated soil and to determine the need to collect extra samples for laboratory analysis.

8.6.2.3 At each sampling location/depth, sufficient quantity of soil (as specified by the laboratory) should be recovered to facilitate analyses of the specified suite of parameters. All soil samples should be uniquely labelled. Backup samples should be retained and stored at 0 - 4 ºC in laboratory.

8.6.3 Strata Logging

8.6.3.1 Strata logging for boreholes should be undertaken during the course of drilling/digging and sampling by a qualified geologist. The logs should include the general stratigraphic description, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics should also be recorded.

8.6.4 Groundwater Sampling and Free Product Measurement

8.6.4.1 Groundwater samples should be collected at each of the sampling location if groundwater were encountered.

8.6.4.2 At each borehole location, a groundwater sampling well should be installed. A typical design of a groundwater monitoring well is shown in **Appendix 8.7**. After installation of the monitoring wells, the depth to water table at all monitoring wells should be measured with an interface probe in order to assess groundwater gradients and predominant flow direction. Prior to sampling activities, wells should be fully developed to ensure formation water is flowing into and out of the wells. The wells should then be allowed to stand for a day to permit groundwater conditions to equilibrate.

8.6.4.3 Groundwater level and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken. In the unlikely event that measurable thicknesses of free product were encountered, a sample should be collected for laboratory analysis to determine the composition.

8.6.4.4 Prior to groundwater sampling, the monitoring wells should be purged to collect representative fresh groundwater samples.

8.6.4.5 After purging, one groundwater sample should be collected at each well using Teflon bailer and decanted immediately into appropriate sample containers in a manner that minimises agitation and volatilization of VOCs from the samples for the purpose of storage and

transportation. The sample containers should be supplied by the laboratory and should be new, clean and made of 'amber glass'. Groundwater samples should be placed in the glass containers with zero headspace and promptly sealed with a septum-lined cap. All samples should be uniquely labelled.

8.6.4.6 Immediately after collection, samples should be placed in ice chests, cooled and maintained at temperature of about 0-4ºC until delivered to the analytical laboratory.

8.6.5 Sample Size and Decontamination Procedures

8.6.5.1 All down hole or digging equipment should be decontaminated between drilling, digging and sampling event to minimise the potential for cross contamination. The equipment (including drilling pit, digging tools and soil/groundwater samplers) should be decontaminated by washing with phosphate-free detergent and rinsed with distilled / deionised water.

8.6.5.2 Prior to sampling, the laboratory responsible for analysis should be consulted on the particular sample size and preservation procedures that are necessary for each chemical analysis.

8.6.5.3 The sample containers should be laboratory cleaned, sealable, water-tight, made of glass or other suitable materials with aluminum or Teflon-lined lids, so that the container surface will not react with the sample or adsorb contaminants. No headspace should be allowed in the containers which contain samples to be analysed for VOCs, petroleum carbon ranges or other volatile chemicals.

8.6.5.4 The containers should be marked with the sampling location codes and the depths at which the samples were taken. If the contents are hazardous, this should be clearly marked on the container and precautions taken during transport. Samples should be stored at between 0-4 ºC but never frozen. Samples should be delivered to the laboratory on the same day the sample being taken and analysed within the respective holding time, but, in any case, not more than 10 days after samples being taken.

8.6.6 QA/QC Procedures

8.6.6.1 QA/QC samples should be collected in the following frequency during the SI works. Chain of Custody protocol should be adopted.

- 1 equipment blank per 20 samples for full suite analysis;
- 1 field blank per 20 samples for full suite analysis;
- 1 duplicate soil sample per 20 soil samples and 1 duplicate groundwater sample per 20 groundwater samples for corresponding parameters analysis; and
- 1 trip blank sample per trip for analysis of VOCs.

8.6.7 Health and Safety

8.6.7.1 The specific safety measures to be taken depend on the nature and content of contamination, the site conditions and the regulations related to site safety requirements.

Workmen Compensation Insurance and third party insurance must be provided for the site investigation (SI).

8.6.7.2 Extreme care should be exercised in the event that potentially toxic gases or other suspected hazardous materials are encountered. Any abnormal conditions found shall be reported immediately to the safety officer and the land contamination specialist.

8.6.7.3 The SI contractor shall establish and maintain a Health and Safety Plan before commencement of the SI that will include the following:-

(a) Instruction of works on work procedures, safe practices, emergency duties, and applicable regulations;

(b) Regularly scheduled meetings of the workers in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;

(c) Good housekeeping practices; and

(d) Availability of and instruction in the location, use and maintenance of personal protective equipment.

8.6.7.4 The SI contractor shall maintain equipment and supplies reasonably required in an emergency, including lifesaving, evacuation, rescue and medical equipment in good working order and condition at all times. The SI contractor shall use all reasonable means to control and prevent fires and explosions, injury to personnel and damage to equipment of property. Without limiting the foregoing, the SI contractor shall:-

(a) Maintain proper safety devices, barriers to minimize hazards during performance of the work;

(b) Prohibit smoking and open flames and the carrying of matches and lighters;

(c) Develop and maintain a written emergency plan applicable to the Work and Site;

(d) Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;

(e) Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;

(f) Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for existing work, weather and environmental conditions; and

(g) The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.

8.6.8 Laboratory Analysis

8.6.8.1 **Table 8.6** summarizes the parameters, the recommended reporting limits and reference methods for the laboratory analyses of soil and groundwater samples for the COCs under this land contamination assessment. The recommended reporting limits are all below the corresponding RBRGs.

Table 8.6 Parameters, Reporting Limits and Reference Methods for Laboratory Analysis

Item	Parameter	Soil		Groundwater	
		Reporting Limit (mg/kg) or otherwise specified	Reference Method*	Reporting Limit (µg/L) or otherwise specified	Reference Method*
SVOCs					
1	Acenaphthene	0.5	USEPA 8270	2	USEPA 8270
2	Acenaphthylene	0.5		2	
3	Anthracene	0.5		2	
4	Benzo(a)anthracene	0.5		NA	
5	Benzo(a)pyrene	0.5		NA	
6	Benzo(b)fluoranthene	0.5		1	
7	Benzo(g,h,i)perylene	0.5		NA	
8	Benzo(k)fluoranthene	0.5		NA	
9	bis-(2-Ethylhexyl)phthalate	5		NA	
10	Chrysene	0.5		1	
11	Dibenzo(a,h)anthracene	0.5		NA	
12	Fluoranthene	0.5		2	
13	Fluorene	0.5		2	
14	Hexachlorobenzene	0.2		4	
15	Indeno(1,2,3-cd)pyrene	0.5		NA	
16	Naphthalene	0.5		2	
17	Phenanthrene	0.5		2	
18	Phenol	0.5		NA	
19	Pyrene	0.5		2	
VOCs					
20	Acetone	50	USEPA 8260	500	USEPA 8260
21	Bromodichloromethane	0.1		5	
22	2-Butanone	5		50	
23	Chloroform	0.04		5	
24	Methyl tert-Butyl Ether	0.5		5	
25	Methylene Chloride	0.5		50	
26	Styrene	0.5		5	
27	Tetrachloroethene	0.04		5	
28	Trichloroethene	0.1		5	
29	Benzene	0.2		5	
30	Toluene	0.5		5	
31	Ethylbenzene	0.5		5	
32	Xylenes (Total)	2		20	
Metals					
33	Antimony	1		NA	NA

Item	Parameter	Soil		Groundwater	
		Reporting Limit (mg/kg) or otherwise specified	Reference Method*	Reporting Limit (µg/L) or otherwise specified	Reference Method*
34	Arsenic	1	USEPA 6020	NA	NA
35	Barium	1		NA	NA
36	Cadmium	0.2		NA	NA
37	Chromium III^	1	By calculation	NA	NA
38	Chromium VI	1	USEPA 3060 APHA 3500 CR:D	NA	NA
39	Cobalt	1	USEPA 6020	NA	NA
40	Copper	1		NA	NA
41	Lead	1		NA	NA
42	Manganese	1		NA	NA
43	Mercury	0.05	APHA 3112B	0.5	APHA 3112B
44	Molybdenum	1	USEPA 6020	NA	NA
45	Nickel	1		NA	
46	Tin	1		NA	
47	Zinc	1		NA	
PCRs					
48	C_6 - C_8	5	USEPA 8015/8260	20	USEPA 8015/8260
49	C_9 - C_{16}	200		500	
50	C_{17} - C_{35}	500		500	

Notes:
NA = Not Applicable
^ Chromium III is quantified by calculation based on Chromium VI and Total Chromium measured under HOKLAS accredited methods.
* Alternative testing methods with accreditation by HOKLAS or its Mutual Recognition Arrangement partners are also accepted.

8.6.8.2 All laboratory testing methods for the above parameters should be accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or one of its Mutual Recognition Arrangement partners.

8.7 Prediction and Evaluation of Potential Impacts

TKO 137

8.7.1.1 As discussed in **Section 8.5** above, potential land contamination activities associated with the handling of chemicals / chemical wastes were identified at the WSD Site, TKOFB, TKOSF and 3RS Site. However, for the WSD Site, the allocatee (i.e. WSD) shall be responsible for the land contamination assessment of the WSD Site and ensure the site is free from contamination at the expiry of allocation, therefore any land contamination arising from operation of the WSD Site would have been remediated prior to the construction of the Project. For TKOFB, TKOSF and 3RS Site, these sites are Designated Projects under the EIAO with respective Environmental Permits. There are regular site walks by the ETs

and verification by IECs. Any sign of land contamination detected had been rectified in accordance with the EIAO during the course of the operation and decommissioning phases of these facilities. In addition, no records of spillage / leakage incidents involving chemicals / chemical wastes were reported by the EPD and FSD for these sites. As such, potential land contamination impact associated with operation of these sites to the Project is not anticipated.

8.7.1.2 Apart from the above and based on findings of the site appraisal, 2 areas with potential land contamination issues were identified within the TKO 137, which are the oil stain identified at the skips and skip lorries parking area (Site S1) and the future concrete batching plant and transformer room (Site S2) in TKO 137.

8.7.1.3 For the oil stain identified at the skips storage and skip lorries parking area (Site S1) at TKO 137, given the size of the oil stain was considered small (approximately 10m^2), and there were no records of spillage / leakage accidents involving chemicals / chemical wastes within the site reported by EPD and FSD, the contamination extent, if any, caused by the site operation is anticipated to be localised. Furthermore, the COCs identified included metals, VOCs, SVOCs and PCRs, which are readily treatable using established techniques and have been effectively remediated in Hong Kong using proven remediation techniques. However, as the site is still in operation, it is considered not feasible to carry out the SI works during the EIA Study, and there could be change in land use or additional hotspots within the site prior to development. Therefore, further works including site re-appraisal, SI works and if necessary remediation works are recommended to be carried out after the site operation has ceased by prior to construction of the Project. Details of the recommended further works are discussed in **Section 8.8.1**.

8.7.1.4 For the future concrete batching plant and transformer room (Site S2) which is currently under construction, as concrete batching plant and transformer room are considered as contaminating land uses according to the EPD Practice Guide, further site appraisal should be carried out after operation of the future concrete batching plant has ceased but prior to the construction works of the Project to confirm any potential land contamination issue to the Project. Therefore, further works including site re-appraisal, and if necessary, SI works and remediation works, are recommended to be carried out after decommissioning of the concrete batching plant but prior to construction of the Project. Details of the recommended further works are discussed in **Section 8.8.1**.

8.7.1.5 Any soil/groundwater contamination would be identified and properly treated prior to the commencement of construction works under the Project if the further works as stated in **Section 8.8.1** were implemented. Land contamination impacts are considered surmountable to future occupants if the further works are followed and contaminated soil and groundwater (if any) were properly treated according to EPD's agreed Remediation Action Plan (RAP).

TKO 132

8.7.1.6 Based on the findings of the site appraisal, no potentially contaminating land uses / activities were identified in TKO 132. As such, no potential land contamination impact associated with the proposed development at TKO 132 to the Project is anticipated.

8.8 Mitigation of Adverse Environmental Impacts

8.8.1 Recommended Further Works

8.8.1.1 Further site appraisal and, if necessary, intrusive SI and remediation works should be carried out in accordance with EPD's Guidance Manual, Guidance Note and Practice Guide.

8.8.1.2 For the skips storage and skip lorries parking area (Site S1) within TKO 137, as the site is still in operation, it would not be feasible to carry out the proposed SI works under the EIA Study. Moreover, based on the tentative construction programme, site clearance will not commence until 2029, there could be changes in the operation or changes in land use within the site which may cause further contamination issues. Further site appraisal should be carried out when site operation has ceased / after site handover in order to assess the latest site conditions and to address any new contamination issues caused by any changes in site operation and/or land use within the site. The associated SI works and any necessary remediation action are recommended to be carried out after the site operation has ceased but prior to the commencement of construction works at the site.

8.8.1.3 For the future concrete batching plant and transformer room (Site S2) within TKO 137, it is considered as a contaminating land use according to the EPD Practice Guide and the site was still under construction at the time of reporting. Further site appraisal should be carried out when site operation has ceased / after site handover in order to identify the presence of any potential land contamination sources within the site. Any necessary SI works and remediation action are recommended to be carried out after decommissioning of the facility but prior to commencement of construction works at the site.

8.8.1.4 The further site appraisal and submission of Contamination Assessment Plan(s) (CAP(s)) should be carried out prior to the commencement of the SI works. CAP(s), presenting findings of the further site appraisal, the latest site conditions and updated sampling strategy and testing protocol, should be submitted to EPD for endorsement. The SI works should be carried out according to EPD's agreed CAP(s). Following the completion of SI works and receipt of laboratory test results, Contamination Assessment Report(s) (CAR(s)) would be submitted to EPD for approval to present the findings of the SI works and to discuss the presence, nature and extent of contamination. If contamination is identified, RAP(s) which provides details of the remedial actions for the identified contaminated soil and / or groundwater should also be submitted to EPD for approval.

8.8.1.5 Remediation works (if necessary) would need be carried out according to the approved RAP. Upon completion of remediation work, Remediation Report (RR) should be prepared and submitted to EPD to demonstrate that the decontamination work is adequate and is carried out in accordance with the approved CAR and RAP. No construction works, other than decontamination work, should be carried out before the approval of RR by EPD.

8.8.1.6 Since the further land contamination assessment and, if necessary, remediation works can only be carried out after site handover by 2029 tentatively, a tentative programme for land contamination assessment after site handover is shown in **Table 8.7**. It should be noted that the tentative schedule is subject to the site handover programme and the actual time span is subject to the actual site conditions.

Table 8.7 Tentative Programme for Land Contamination Assessment

Task	Tentative Programme
Further site appraisal, preparation and submission of CAP(s)	1-2 months after site handover
Approval of CAP(s)	3 months after site handover
SI works, laboratory tests, preparation and submission of CAR(s)/RAP(s)	4-6 months after site handover
Approval of CAR(s)/RAP(s)	7 months after site handover

Task	Tentative Programme
Remediation works, preparation and submission of RR (if required)	Subject to results of the SI works and programme of remediation works

8.8.2 Possible Remediation Measures

8.8.2.1 The actual remediation methods could only be determined after completion of the land contamination assessment (including intrusive SI works and EPD's agreement on the CAR and RAP) at the later stage of the Project. The RAP will provide details of the remedial actions for any identified contaminated soil and groundwater.

8.8.2.2 Based on the site appraisal, the potential COCs identified include metals, VOCs, SVOCs and PCRs. For contaminated soil, there are a number of technologies commercially available to tackle the identified COCs and are presented in the Practice Guide. Technologies that are commonly used in Hong Kong are biopiling and cement solidification/stabilisation. These *ex-situ* methods were proven to be effective in treating metals, VOCs, SVOCs and PCRs, and the treated soil could then be reused on site (e.g. backfilling materials). For groundwater, there are remediation techniques as shown in EPD's Practice Guide (e.g. air sparging, recovery trenches / wells, in-ground containment/capping and permeable reactive barriers) that could be applied to this Project if contaminated groundwater were identified.

8.8.3 Mitigation Measures for Remediation Works

8.8.3.1 Mitigation measures for the remediation works would depend on the nature / extent of contamination and the method of treatment. The mitigation measures will be recommended in the RAP and would typically include the following:

- Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety;
- Excavation shall be carried out during dry season to minimise contaminated runoff from contaminated soils;
- Suitable clean backfill material (or treated soil) shall be supplied after excavation;
- Stockpiling site(s) shall be lined with impermeable sheeting and bunded. Stockpiles shall be fully covered by impermeable sheeting to reduce dust emission. If this is not practicable due to frequent usage, regular watering shall be applied. However, watering shall be avoided on stockpiles of contaminated soil to minimise contaminated runoff;
- Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions;
- Speed control for the trucks carrying contaminated materials shall be enforced;
- Vehicle wheel and body washing facilities at the site's exist points shall be established and used; and
- Pollution control measures for air emissions (e.g. from biopile blower and handling of cement), noise emissions (e.g. from blower or earthmoving equipment), and water discharges (e.g. runoff control from treatment facility) shall be implemented and complied with relevant regulations and guidelines.

8.9 Evaluation of Residual Impacts

8.9.1.1 The recommended further land contamination assessment and, if required, remediation works for the Project would follow the EPD's Guidance Manual, Guidance Note and Practice Guide and any soil / groundwater contamination would be identified and properly treated prior to the commencement of construction works at the identified contaminated

areas (if any). Land contamination impacts are therefore considered acceptable if the follow up actions as outlined in **Section 8.8.1** are followed, and contaminated soil and groundwater (if any) are properly treated using appropriate remediation methods and according to the EPD approved RAP. No unacceptable residual impacts are anticipated.

8.10 Environmental Monitoring and Audit

8.10.1.1 Remediation works, if necessary, would be carried out based on the recommended further works outlined in **Section 8.8.1**. Mitigation measures as recommended in the future EPD approved RAP should be implemented during the remediation works. The Environmental Monitoring and Audit (EM&A) requirements should be carried out in the form of regular site inspection to ensure the recommended mitigation measures are properly implemented.

8.11 Conclusion

8.11.1.1 A site appraisal, in the form of desktop review and site walkover, was conducted from November 2023 to October 2024 to identify the past and current potentially contaminating land uses within the Project area. Based on the site appraisal, a total of 2 areas with potential land contamination concerns (i.e. an oil stain at the skips storage and skip lorries parking area (Site S1) and the future concrete batching plant and transformer room (Site S2)) were identified at TKO 137 within the Project area. No potentially contaminating land uses / activities were identified in TKO 132.

8.11.1.2 A sampling and testing programme, targeting the hotspot identified within Site S1 had been proposed. A total of 1 location was proposed for soil sample collection. The collected samples will be tested for the COCs including metals, VOCs, SVOCs and PCRs.

8.11.1.3 As Site S1 is still in operation and site clearance will not commence until 2029 based on the tentative construction programme, there could be changes in the operation or changes in land use within the site which may cause further contamination issues. Further site appraisal should be carried out when site operation has ceased / after site handover in order to assess the latest site conditions and to address any new contamination issues caused by any changes in site operation and/or land use within the site. The associated SI works and any necessary remediation action are recommended to be carried out after the site operation has ceased but prior to the commencement of construction works at the site.

8.11.1.4 For Site S2, further site appraisal should be carried out when site operation has ceased / after site handover but prior to construction works of the Project to identify the presence of any potential contamination sources and the need for SI works. Any necessary SI works and remediation action are recommended to be carried out after decommissioning of the facility but prior to commencement of construction works at the site.

8.11.1.5 The recommended further assessment and remediation works, including the submission of CAP(s), CAR(s)/RAP(s) and RR(s) would follow relevant Guidance Manual, Guidance Note and Practice Guide.

8.11.1.6 With the implementation of the recommended follow up works for the Project, any soil/groundwater contamination would be identified and properly treated prior to the construction works. No insurmountable land contamination impacts to the Project are therefore anticipated.