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1 INTRODUCTION

1.1 Background

1.1.1.1 To support social and economic development in Hong Kong, there is a pressing need to optimize the supply of land for various uses by sustainable and innovative approaches. One possible approach is rock cavern development. In the 2009-10 Policy Agenda, the Development Bureau (DEVB) put forward a new initiative to launch strategic planning and technical studies aiming at promoting the enhanced use of rock caverns as part of Hong Kong's pursuit of sustainable development.

1.1.1.2 The Relocation of Sha Tin Sewage Treatment Works (STSTW) to Caverns (the Project) is implemented so as to release the existing site, of a size about 28 hectares, for other uses.

1.1.1.3 In 2011, CEDD completed a study under Agreement No. CE 66/2009 (GE) "Enhanced Use of Underground Space in Hong Kong – Feasibility Study" for land supply initiatives. The study identified the STSTW as a potentially suitable facility to be relocated to caverns.

1.1.1.4 In May 2012, DSD commenced a detailed feasibility study under Agreement No. CE 43/2011 (DS) "Relocation of Sha Tin Sewage Treatment Works to Caverns – Feasibility Study" (the Feasibility Study). The findings of Feasibility Study affirmed that relocating the STSTW to caverns to be constructed at Nui Po Shan of A Kung Kok is technically feasible and financially viable. **Figure 60334056/CAP/1.01** shows the location of the relocated STSTW.

1.1.1.5 In November 2013, DSD consulted the Health and Environment Committee of the Sha Tin District Council (STDC) on the findings and recommendations of the Feasibility Study and the Committee generally supported the Government to proceed with the investigation and design of the Project.

1.1.1.6 AECOM Asia Co Ltd. was commissioned by Drainage Services Department (DSD) on 29 September 2014 to carry out this Assignment for the investigation, design and construction supervision for the relocation of the STSTW to caverns.

1.2 The Assignment

1.2.1.1 The investigation, design and construction of the relocation of STSTW to caverns is part of the overall programme to enhance the land supply strategy for HK and to build up a sufficient large land reserve to meet future social, environmental and economic needs. The primary objective of this Assignment is to carry out preliminary and detailed design of relocating the existing STSTW in caverns. This would release 28 hectares of land for balanced housing and mixed use development. Since the existing STSTW has been in operation for about 30 years, most of the STSTW facilities will be approaching their design life in the next one to two decades, a secondary objective would be to devise a "rejuvenation" scheme meeting the increasing safety, social, environmental and economical demands.

1.2.1.2 The scope of relocation of the STSTW to caverns (the Project) comprises the following components:

Component of the Project	Scope of the Component
(a) Sha Tin Cavern Sewage Treatment Works (CSTW)	(i) Caverns, portals, tunnels, adits, ventilation shafts, etc. (ii) Associated facilities of (i) above including ventilation systems, fire services, safety measures, smoke management and control systems, communication systems, utilities, etc. (iii) Sewage and sludge treatment facilities (iv) Associated facilities to (iii) above including pipeworks and utilities, pipe and utility galleries, odour control and de-odorisation systems, supervisory control and data acquisition systems, laboratories, transformer and switchgear houses, workshops, storage, etc. (v) Modifications to and sewerage connections with the THEES in relation to effluent discharge from the CSTW (vi) Ancillary facilities (vii) Rehabilitation, modification and improvement of the existing emergency submarine outfall and/or construction of a new emergency outfall connecting to the relocated STSTW (viii) Associated slope stabilisation, natural terrain hazard mitigation and geotechnical works (ix) Landscaping and architectural works and amenity areas (x) Operation and maintenance facilities (xi) Decommissioning and demolition of the existing STSTW (xii) All related works including but not limited to environmental control measures and impact mitigation works, TTMS and road improvement works, utility diversions, site office(s), project liaison office, explosives magazine, public-interface facilities, etc. and works incidental to the construction and commissioning of the sub-items (i) to (xi) above
(b) Upstream Sewerage and Pumping Stations (USPS)	(i) Modification, improvement and reprovisioning of existing sewerage facilities upstream of the existing STSTW, including pumping stations, sewers and rising mains (ii) Modification, improvement and reprovisioning of existing facilities related to the conveyance of treated effluent from the TPSTW to the THEES (iii) All related works including but not limited to environmental mitigation works, TTMS, utility diversions, etc. and works incidental to the construction and commissioning of the sub-items (i) to (ii) above

1.3 Scope and Objectives

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns: Contamination Assessment Plan (Final)
Caverns and Sewage Treatment Works - Investigation, Design and Construction

1.3.1.1 Under the context of Environment Impact Assessment Study Brief No. ESB-273/2014, the "Project" is referring to "Sha Tin Cavern Sewage Treatment Works" only. The environmental impacts caused by the construction and operation of USPS will be covered by a separate submission. Based on the EIA Study Brief, an assessment on the potential land contamination issues arising from the CSTW will be required.

1.3.1.2 This Contamination Assessment Plan (CAP) is prepared for the EIA study. The purposes of the CAP are to present the findings of the site appraisal on the past and present potentially contaminative land uses and hotspot areas within the CSTW Site and to propose the sampling and testing programme for the subsequent site investigation (SI) works. The CSTW Site along with the scope of the various components and works areas are shown in **Figure 60334056/CAP/1.01**.

1.4 Structure of the Report

1.4.1.1 Apart from this introductory section, the other sections of the CAP are as follows:

Section 2 - presents the findings of the site appraisal

Section 3 - proposes the sampling and testing plan for subsequent SI works

Section 4 - discusses the analytical testing requirements for the subsequent SI works

Section 5 - discusses the adopted land contamination assessment criteria

Section 6 - evaluate the potential land contamination impact and the possible remediation measures

Section 7 - presents the conclusion and way forward

2 SITE APPRAISAL

2.1 General

2.1.1.1 The CSTW Site, scope of the component and Works Areas as discussed in **Section 1.2.1.2** are illustrated in **Figure 60334056/CAP/1.01.** For the purpose of this assessment, the CSTW Site is divided into the following 3 areas:

(i) Existing STSTW

The area included the existing STSTW but excluded the WSD Salt Water Pumping Station to the north of STSTW (refer to **Figure 60334056/CAP/2.02**).

(ii) Part of existing Vehicle Detention Centre (VDC) and its surrounding areas (for proposed temporary works area).

The area comprises part of existing Vehicle Detention Centre (VDC) (i.e. the temporary works area on Area 73) and its surrounding areas (refer to as 'Area A'). The areas are shown in **Figure 60334056/CAP/2.02.** Surrounding areas of VDC mainly include a small section of A Kung Kok Street near the entrance of THEES portal, vacant area adjacent to VDC, landscape area south of VDC (between Ma On Shan Road and A Kung Kok Road), and cycling tracks and footpaths northeast of VDC.

(iii) Nui Po Shan North (for proposed cavern sewage treatment works, emergency portal area, cavern portal area, Ah Kung Kok Shan Road surface magazine site and proposed area for Natural Terrain Hazard Study).

The area mainly covered the northern portion of existing Nui Po Shan, bounded to the north by Mui Tsz Lam Road and northwest by A Kung Kok Street (refer to **Figure 60334056/CAP/2.02**).

2.2 Previous Land Contamination Assessment

2.2.1.1 A review on the land contamination concern for the Project had been conducted under the Feasibility Study. The review included a desktop study on the following sources of information as well as a preliminary intrusive site investigation (SI) within the existing STSTW.

- Relevant ground investigation reports from the Civil Engineering and Development Department (CEDD) civil engineering library;
- Hong Kong Geological Survey Map (Series HGM20) – Sheet No. 7 (1:20,000); and
- Selected aerial photographs and topographic map held by the Lands Department.

2.2.1.2 The areas of potential land contamination concerns related to this assessment identified under the Feasibility Study include the existing STSTW and VDC. As the construction of caverns, tunnels and the relocated STSTW / ancillary facilities would be mainly conducted within bedrock, land contamination issues were not anticipated in the area at the time.

2.2.1.3 For the existing STSTW site, information regarding dangerous goods (DG) storages and spillages was acquired from the Fire Service Department (FSD) at the time. FSD confirmed that there has been no recorded incident of spillages or leakage of dangerous good. DG license record was also acquired from FSD. Among the chemicals listed in FSD's DG license record, only diesel fuel is identified as a potential contaminant. Other chemicals are either gaseous or highly water-soluble which are not considered to pose any land contamination concerns.

2.2.1.4 Preliminary soil and groundwater sampling works within the existing STSTW were carried out from 28 June to 29 July 2013. Inspection pits were excavated to retrieve the soil

samples. A total of 35 soil samples (including 2 duplicate samples) and 9 groundwater samples were collected from 13 sampling locations and analyzed for semi volatile organic compounds (SVOCs) and petroleum carbon ranges (PCR). The as-built sampling locations and the preliminary laboratory results extracted from the Feasibility Study are shown in **Appendix 2.01**.

2.2.1.5 The preliminary results of the sample analyzed indicate no exceedance in the risk-based remediation goals (RBRBs) for soil and groundwater under the Urban Residential Land Use Scenario. No contaminants under the investigation were detected in the testing.

2.3 Review of Historical Land Uses

General

2.3.1.1 A comprehensive review of aerial photographs has been undertaken under this Assignment to confirm the findings from the Feasibility Study. The aim of the review is to evaluate the likelihood of potential contamination associated with past land uses within the CSTW Site. The development history of the CSTW Site is summarised below and the list of aerial photographs reviewed is shown in **Table 2.1**. Selected aerial photos are provided in **Appendix 2.02**.

Table 2.1 Aerial Photographs Reviewed

Year	Height (Feet)	Photograph Reference Number
1963	7000	0237
1963(2)	3900	63_5313
1974	12500	8246
1979	10000	28624
1981	2200	37599
1982	10000	44629
1983	4000	48577
1985	5000	CN973
1989	4000	A16196
1991	4000	A27102
1993	4000	A34676
1994	9000	CN6447
1995	2500	CN10812
2004	4000	CW62791
2009	6000	CS25120
2014	2000	CW109254
2015	8000	CW111916

2.3.1.2 Based on the review of the aerial photographs, both the existing STSTW and Vehicle Detention Centre sites are reclaimed land. The earliest available aerial photograph taken in 1963 indicated that the areas of the 2 sites were part of Sha Tin Hoi.

Existing STSTW

2.3.1.3 The reclamation works in the area was first noted in 1974 and completed around 1981. The construction of STSTW began around 1979 and the Stage I construction was nearly completed in 1982 with the main facilities constructed. The STSTW Stage II and III extension works were noted from 1983 until completion in 2004. No significant changes at the study area were noted after the construction of the UV disinfection chamber within the Site in 2009.

Existing Vehicle Detention Centre (VDC) and Its Surrounding Areas

Existing VDC

2.3.1.4 Reclamation of the VDC and Area A was completed in 1985. The area of the existing VDC remained vacant until structures were observed from 1989 to 1993. The actual uses of these structures were likely for nearby construction works as according to the topographic maps dated June 1989 and July 1992, the areas were labeled as “Construction in Progress” and “Work in Progress”. The whole area was vacant again after 1993 and then became a car park in 1995 until 2004 when the footprint of the VDC was noted. No change in land uses were observed since then.

Area A

2.3.1.5 A Kung Kok Street was first observed in 1982. The landscape area (between Ma On Shan Road and A Kung Kok Road) was remained vacant after reclamation in 1985 and was observed covered with vegetation in 2009.

2.3.1.6 Similar to VDC, the remaining area of Area A appeared to be a construction site from 1989 until 1993 when the area turned vacant. Cycling tracks and footpaths at northeast of VDC were observed in 1995 and the vacant area adjacent to VDC were observed in 1993. No major changes in land use were noted since then.

Nui Po Shan North

2.3.1.7 The Nui Po Shan North has generally not been developed, with most of the area covered with vegetation, from 1963 until the latest aerial available in 2015. There are two developments noted in the aerial photographs: a construction site office in 1994 along Mui Tsz Lam Road and the THEES portal in 1993 located just south of A Kung Kok Street. No significant change was observed for both developments since then.

Summary of Historical Land Uses

2.3.1.8 Based on the historical land uses review, the main area of land contamination concern is the existing STSTW. For part of existing VDC within the Project boundary and THEES portal, site reconnaissance were conducted to confirm the presence of any on-site contaminating activities for these types of land uses.

2.4 Site Reconnaissance

2.4.1.1 Site walkovers were conducted on 7 and 14 November 2014 and 28 January, 17 and 24 July 2015 to investigate any contaminative issues associated with current land uses and activities within the CSTW Site. Questionnaires, if possible, were conducted with available site representatives.

Existing STSTW

2.4.1.2 Site walkover was conducted on 7 November 2014 and 28 January 2015. The completed Site Walkover Checklists and photographic records are annexed in **Appendix 2.03a**.

2.4.1.3 Based on the site observations and confirmation from the review of aerial photographs, a large portion of the site was covered by vegetation with less than half of the area occupied by facilities and buildings.

2.4.1.4 Except for the vegetated areas, all facilities/buildings and access roads within the site were paved with intact concrete and no oil stains or stressed vegetations were observed. The site condition is considered orderly and well managed.

2.4.1.5 Based on the site condition and nature of sewage treatment operations, widespread contamination is not envisaged across the site. The potential land contamination concerns are likely restricted to facilities / buildings that handle hazardous chemicals or chemical wastes. The facilities / buildings with potential for handling hazardous substances were identified during the site walkover and discussed in **Table 2.4**. Locations of these potential hotspots areas are shown in **Figure 60334056/CAP/2.01.** A total of 27

transformers (labeled as Transformer No. 1 to No. 24, Transformer A and CLP No. 1 to CLP No. 2) were identified within STSTW as shown in **Figure 60334056/CAP/2.01.**

Chemicals of Concern

2.4.1.6 Details of DG and chemical wastes handled within the site were obtained from FSD and DSD respectively (refer to **Section 2.5** below for details) and are summarized below:

Dangerous Goods

- Sodium Hydroxide Solution (in various above-ground storage tanks);
- Sodium Hypochlorite Solution (in various above-ground storage tanks);
- Diesel (in a 1000L above-ground storage tank);
- Acetylene (in gas cylinders);
- Hydrogen (in gas cylinders);
- Compressed Air (in gas cylinders);
- Argon (in gas cylinders);
- Helium (in gas cylinders);
- Nitrogen (in gas cylinders);
- Oxygen (in gas cylinders);
- Carbon dioxide (in gas cylinders);
- 40% carbon dioxide balanced in methane (in gas cylinders);
- Nitrous oxide (in gas cylinders);
- Hydrochloric acid (in 2.5L cylinders);
- Sulphuric acid (in 2.5L cylinders);
- Phosphoric acid (in 2.5L cylinders); and
- Nitric acid (in 2.5L cylinders)

Other Chemicals / Chemical Wastes

- Lubricating oil;
- Transformer oil;
- Battery
- Mineral oil
- Organic solvent
- Ferric chloride (iron (III) chloride)

2.4.1.7 Of the above chemicals, acetylene, hydrogen, compressed air, argon, helium, nitrogen, oxygen, carbon dioxide and nitrous oxide are gaseous and insoluble in water and not considered to be land contaminants.

2.4.1.8 Hydrochloric acid, sulphuric acid, phosphoric acid and nitric acid are common acids. Sodium Hydroxide is a common base. Both are highly soluble in water. The primary effect of leakage of these chemicals to the ground would be lowering or raising of soil pH respectively. Acids or bases are not considered to be land contaminants.

2.4.1.9 Sodium hypochlorite is a strong oxidize, once expose to the environment, it rapidly reduces to chloride which is not considered to be a land contaminant.

2.4.1.10 When dissolved in water ferric chloride forms highly charged ionic solution which is used as flocculant in sewage treatment. Iron (III) may reduce to Iron (II), however neither iron (II/III) nor chloride ions are considered as potentially land contaminating.

2.4.1.11 Diesel fuel is commonly known as land contaminant and is used primarily for power generation. Relevant chemicals of concern (COCs) for diesel include lead, BTEX, polyaromatic hydrocarbons (PAHs) and petroleum carbon ranges (PCR).

2.4.1.12 Other chemicals include lubricating oil, transformer oil, mineral oil and organic solvent The COCs are metals, VOCs, PAHs, PCRs and PCBs.

Existing VDC and its Surrounding Areas

2.4.1.13 Site walkover was conducted on 14 November 2014 and 17 July 2015. The completed Site Walkover Checklists and photographic records are annexed in **Appendix 2.03b**.

2.4.1.14 VDC was operated by the Customs and Excise Department (C&ED). Site walkover was conducted with representative staff from DSD and C&ED on 14 November 2014. The main activities carried out at the site were storage of detained vehicles and seized goods. Based on the site visit and C&ED's email dated 14 October 2015, the detained vehicles are in good condition and the seized goods are only empty containers. The area is only used for storage and neither vehicle nor equipment repairing activity was conducted. Apart from the pest control used on-site, no chemicals were observed stored or handled on site. The area was concrete paved and no apparent stains were observed during the site walkover.

2.4.1.15 According to C&ED's email dated 14 October 2015 and letter dated 04 November 2015, one lot of spent vehicle batteries was temporarily stored on site in 2012 and was later collected from VDC by EPD's licensed chemical waste collector. No past records of battery leakage were reported within the VDC. A Registration of Waste Producers for spent battery was issued to C&ED by EPD on 09 October 2012. Details of the C&ED's replies are attached in **Appendix 2.05**.

2.4.1.16 In order to identify the location of the spent batteries temporary storage area, further site walkover to VDC was conducted with C&ED's representative on 30 November 2015. Based on the further site walkover, the area was paved with additional layer of concrete above the concrete paved ground. No stain and stressed vegetation were observed.

2.4.1.17 Based on the site condition and nature of VDC, widespread contamination is not envisaged across the site. The potential land contamination concerns are likely restricted to the temporary storage area for the spent batteries and storage area for seized goods, both located within the Project boundary. The COCs for seized goods storage area are metals, VOCs, SVOCs, PCRs and PCBs. Metals, such as lead, can be commonly found in vehicle batteries and are considered to be the COCs for the temporary spent batteries storage area. Locations of the potential hotspots are shown in **Figure 60334056/CAP/2.03**.

Area A

2.4.1.18 Site walkover for Area A was conducted on 17 July 2015. Based on the site walkover, the areas were vacant / undeveloped or used as footpath or cycling track. No land contamination issue was identified within Area A.

Nui Po Shan North

2.4.1.19 The area mainly covered the northern portion of the undeveloped Nui Po Shan. Based on the site walkover, there are 3 areas that had been developed, viz. Contractor's Works Area at Mui Tsz Lam Road, the THEES Portal and the Evangelical Lutheran Church of Hong Kong (David Camp). The 3 areas are shown in **Figure 60334056/CAP/2.02.**

2.4.1.20 Site walkover was conducted on 24 July 2014 and the completed Site Walkover Checklists for Contractor's Works Area and THEES Portal as well as photographic records are annexed in **Appendix 2.03c**.

2.4.1.21 The Contractor's Works Area at Mui Tsz Lam Road was managed by Welcome Construction Co. Ltd.. The works area was used as site offices, car parking area and storage of construction materials. Based on the site walkover, the site was paved with intact concrete with absence of stains on ground. No chemicals / chemical wastes were reportedly or observed stored on-site.

2.4.1.22 The THEES Portal commenced operation in 1994 and was operated by DSD to serve as the inlet point to convey the treated effluent to Victoria Harbour. Based on the site walkover, the area only comprises of an access road, valve chamber, concrete inlet chamber and a switch room. The site was paved with intact concrete with absence of stains on ground. No chemicals / chemical wastes were reportedly or observed stored on-site.

2.4.1.23 The David Camp was not accessible at the time of the site walkover. However, according to Leisure and Cultural Services Department (LCSD) website, David Camp is a holiday camp site operated by Evangelical Lutheran Church of Hong Kong. The site is likely to be used for non-contaminating activities such as recreation activities, classrooms, place of worship and accommodations.

2.4.1.24 No land contamination issue was identified during the site walkover within the Nui Po Shan North.

2.5 Acquisition of Information from Government Departments

2.5.1.1 The Environmental Protection Department (EPD) and FSD have been contacted for (i) records on any release of chemicals and chemical waste, (ii) records of DG, (iii) records of Chemical Waste Producer(s) and (iv) records of reported fire incidents within the CSTW Site. EPD and FSD's replies on the request have been received and attached in **Appendix 2.04**. Information is summarized below.

Environmental Protection Department

2.5.1.2 Further to the EPD's replies, visits to EPD's Southorn Centre Office were undertaken on 19 November 2014 and 26 October 2015 to review the available Chemical Wastes Producers records. There are chemical producer records within STSTW but no records were noted within the remaining CSTW Site.

2.5.1.3 Details of the records within STSTW were not available for inspection. Instead, copies of the Chemical Waste Producer records were obtained from DSD on 24 July 2015 for the STSTW and details are summarized in **Table 2.2**.

2.5.1.4 In addition to the above and as discussed in **Section 2.4**, a copy of the Chemical Waste Producer records were provided by C&ED on 14 October 2015 for the VDC and details are summarized in **Table 2.2**.

2.5.1.5 Based on the replies given by EPD, EPD has no record of reported accident of spillage / leakage within the CSTW Site.

Table 2.2 Summary of CWPs within the CSTW Site

CWPs (CWP No.)	Status	Type of Chemical Wastes	Year of Application
STSTW			
Director of Drainage Services (0014-753-D2226-10)	Inactive	- Spent lubricating oil; - Transformer oil; - Diesel oil; - Alkaline solution - Battery	1999
	Active	- Spent lubricating oil; - Spent mineral oil; - Unwanted battery; and - Wastes containing lubricating/mineral oil	2013
Director of Drainage Services (0014-753-D2153-02)	Active	- Spent acid with oxidizer; - Spent acid; - Spent alkali; and - Spent organic solvent	1992
VDC			
Commissioner of Customs and Excise (0012-756-C3760-01)	Active	- Spent battery	2012

Fire Services Department

2.5.1.6 FSD had provided the DGs records and were the same as those acquired under the Feasibility Study for STSTW. There are no DG records within the remaining CSTW Site. Details of the DGs are provided in **Appendix 2.04**.

2.5.1.7 FSD also reported that there has been no incidents of spillage/leakage of DGs reported at the CSTW Site.

2.6 Summary of Site Appraisal

2.6.1.1 Findings of the site appraisal are summarised below:

Existing STSTW

2.6.1.2 A number of hotspots, including, for example, workshop, transformers, generators, diesel tanks and chemical / chemical waste storage area, were identified during the site walkover. There could be land contamination impacts if the underlying soil / groundwater were contaminated during the handling and storage of hazardous substances. SI works are recommended within the existing STSTW and the COCs include metals, VOCs, SVOCs, PCRs and PCBs.

<u>Geology and Hydrogeology of Existing STSTW</u>

2.6.1.3 According to the 1:20,000 Geological Map Sheet 7, the existing STSTW is generally underlain by granite with minor intrusions of fine grained granite with rhyolite, tuff and granodiorite recorded.

2.6.1.4 Ground investigation (GI) works as well as the review of past GI data had been undertaken at or in the vicinity of the existing STSTW under the Feasibility Study. The GI works were carried out in the period from September to November 2013. Findings of the GI works and data review were documented in the Feasibility Study prepared by AECOM in 2014.

2.6.1.5 With reference to the abovementioned report, the superficial geology of the existing STSTW site generally comprises fill materials of average thickness equals to 13.3m, which is then underlaid by a layer of slightly sandy, highly or very highly plastic clay. Isolated beach deposits and estuarine deposits were observed below the marine deposits. Alluvium with average thickness of 7.6m was found in the majority of the site. Rockhead levels generally fall from west to east across the existing STSTW with highest rock head lies at -11mPD, while the deepest lies at -40 mPD.

Existing Vehicle Detention Centre and its Surrounding Areas

2.6.1.6 Based on the site appraisal, there were no apparent or historical evidence of contamination within Area A. Land contamination impacts are therefore not anticipated within the area.

2.6.1.7 Two hotspots (the temporary storage of spent batteries and storage of seized goods) were identified in the site appraisal. There could be land contamination impacts if the underlying soil / groundwater were contaminated during the handling and storage of hazardous substances. SI works are recommended within the 2 storage areas. The COCs are metals (for spent batteries storage area) and metals, VOCs, SVOCs, PCRs and PCBs (for seized goods storage area).

Nui Po Shan North

2.6.1.8 Based on the site appraisal, there were no apparent or historical evidence of contamination within Nui Po Shan North. There were 3 areas that had been developed

for use as works area for the contractor, the effluent inlet point for the THEES and a holiday camp site managed by Evangelical Lutheran Church of Hong Kong. Based on the site walkover, there were no contaminating activities identified within the 3 developed areas. Land contamination impacts are therefore not anticipated within Nui Po Shan North.

Table 2.3 Summary of Site Appraisal

Location (Site Area)	Concerned Area (approx. area)	Summary of Site Appraisal	Photo Reference in Appendix 2.03a	Necessity and Rationale for Intrusive Site Investigation (SI)	Proposed Borehole ID*
Existing STSTW (280,000m^2) (Inspection Date: 7 Nov 2014 & 28 Jan 2015)	Chemical Wastes Store (26 m^2)	- Empty chemical containers are stored on shelf in the Chemical Waste Store. The floor of the store is concrete paved and were observed in good condition without stain. - Chemicals observed included spent sulfuric acid, nitric acid and alkali.	A1	**1** sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH01
	Dangerous Goods (DG) Store (28m^2)	- No report of spillage or leakage of dangerous goods was reported from FSD records - The floor of the DG Store is concrete paved and was observed in good condition. - The DG containers are observed to be in good condition. - Chemicals stored include paints and thinner.	A2 and A3	**1** sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH02
	Chemical Waste Area (42 m^2)	- The Chemical Waste Area has a metal roof and the floor of the area is concrete paved with bunding. The concrete pavement and bunding are in good condition. - Empty lubrication oil, grease container, bleach drum and waste battery are temporary stored in this area until collection by registered chemical waste collector.	A4	**1** sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH03
	Scrap Iron Storage Area (21m^2)	- Metal scraps such as machine parts are temporary stored in this area till collection by contractor. The area is paved with intact concrete.	A5	**1** sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH04
	Chemical Waste Collecting Tank (34 m^2)	- The chemical waste collecting tank is placed on top of a concrete paved area with concrete bunding to prevent spilling and leakage. - Chemical containers and oil drums would be emptied to this collecting tank before placing them in the chemical waste store and chemical waste area.	A6	**1** sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH05
	Mechanic Workshop (1090 m^2)	- The workshop is concrete paved with no oil stain observed. Repair and maintenance of valve bodies, spindles pumps and other light machine take place in the workshop. - Typical maintenance may include greasing and lubrication involving lubrication oil.	A7	**6** sampling locations proposed according to the area. COCs includes metals, VOCs, SVOCs and PCRs.	ENV-BH06 ENV-BH07 ENV-BH08 ENV-BH09 ENV-BH10 ENV-BH11

Location (Site Area)	Concerned Area (approx. area)	Summary of Site Appraisal	Photo Reference in Appendix 2.03a	Necessity and Rationale for Intrusive Site Investigation (SI)	Proposed Borehole ID*
	Administration and Laboratory Buildings, CLP Transform No. 1, Transformer No. 19 and No. 20	- The area housed offices and laboratory. The laboratory is located on the first floor of the Laboratory Building. - The ground floor of the Laboratory Building is used only as an exhibition center and general storeroom (e.g. brand new plastic tubes and wooden sticks). No chemicals were found. - There are a total of 3 transformers (labeled as 'CLP Transformer No. 1' and 'Transformer No. 19' and 'No. 20') in the area. - CLP Transformer No. 1 is operated by CLP and located within the substation. Ground are concrete paved and without stains. - Transformer No. 19 and No. 20 are housed within the transformer rooms. The transformer rooms are elevated on an approximately 0.5m concrete platform.	A8, A9 and A10	No land contamination was found within the ground floor of the Administration and Laboratory Buildings. Intrusive SI was considered not necessary. **3** sampling location is proposed for the transformer CLP No. 1, No.19 and No. 20 COCs includes metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH12 ENV-BH12A ENV-BH12B
	Chemical Store (166 m^2)	- The Chemical Store is fully enclosed and the floor of the store is concrete paved. No sign of spillage or stain was observed. - Mainly lubrication oil was stored in the area.	A11	**3** sampling locations proposed based on the area. COCs include metals, VOCs, SVOCs and PCRs.	ENV-BH13 ENV-BH14 ENV-BH15
	Fuel Oil Tanks	- There are two 1000 L above-ground diesel storage tanks to fuel the nearby generators. - The 2 storage tanks are placed on concrete paved ground with bunding. The paved ground and bunding are observed to be in good condition. - A diesel filling point was also observed near the diesel storage tank.	A12 and A13	**3** sampling locations are proposed (2 at each storage tank and 1 at the diesel filling point). COCs include metals, VOCs, SVOCs and PCRs.	ENV-BH16 ENV-BH17 ENV-BH18
	Power House + Transformer No. 21 and No. 22 (2470 m^2)	- The Power House consisted of a (i) generator room, (ii) control room / office and (iii) air blower rooms. - The generator room (approximately 1,525 m^2) housed 6 generators. Lubrication oil bottles and oil drums are observed at the temporary chemical waste collecting point (approx 6m^2), at the southern corner of the generator room. The room is tiled and paved with concrete. No stains were observed. - The air blower rooms (approximately 675 m^2) housed 5 air blowers and are located at the northern portion of the building. The room is paved with intact concrete with no stains observed. - Two transformers (labeled as 'Transformer No. 21' and '22') were located at the western side of the Power House.	A14 and A15	**14** sampling locations proposed (6 for generator room, 5 for the air blower room, 2 for each of the transformers and 1 for the chemical waste collecting point). COCs include metals, VOCs, SVOCs, PCRs and PCBs (for transformer only).	ENV-BH19 ENV-BH20 ENV-BH21 ENV-BH22 ENV-BH23 ENV-BH24 ENV-BH25 ENV-BH26 ENV-BH27 ENV-BH28 ENV-BH29 ENV-BH30 ENV-BH31 ENV-BH32

Location (Site Area)	Concerned Area (approx. area)	Summary of Site Appraisal	Photo Reference in Appendix 2.03a	Necessity and Rationale for Intrusive Site Investigation (SI)	Proposed Borehole ID*
	Boiler House (231 m^2)	- The Boiler House is connected with the Power House. - Four set of hot water boiler were observed in the building. Site supervisor reported neither fuel nor lubricant is needed for the boiler to operate.	A16	No land contamination were found within the ground floor, intrusive SI was considered not necessary.	N/A
	Transformer No. 11 to No. 18	- There are 8 transformers (labeled as Transformer No. 11 to 18) near the Power House for the operation of the Power House and Boiler House. - All 8 transformers are housed within the transformer rooms. The transformer rooms are elevated on an approximately 1.0m concrete platform. No stains were observed on the floor.	A17 and A18	**8** sampling locations proposed for each of the transformer. COCs include metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH-T1 ENV-BH-T2 ENV-BH-T3 ENV-BH-T4 ENV-BH-T5 ENV-BH-T6 ENV-BH-T7 ENV-BH-T8
	Waste Gas Burners (36 m^2)	- There are 2 sets of waste gas burners to burn the methane (biogas) generated from wastewater process. - The facility is in good condition, no stress of vegetation or stain was observed in surrounding area.	A19	No land contamination were found within the ground floor, intrusive SI was considered not necessary.	N/A
	Sludge Thickening House (890m^2) + Transformer No. 5, No. 6 and Transformer A.	- 6 set of consolidated sludge pumps were situated in the basement of the building. - The building is fully concrete paved (included the basement), pipe lines, centrifuge feed tanks, thickened sludge receiving tanks and cold water receiving tanks were observed on the ground floor. - There are 3 transformers (labeled as Transformer No. 5, No. 6 and A) near the Sludge Thickening House. The transformers are on an elevated concrete platform of approximately 1.0m thick. No stains were observed on the floor.	A20 and A21	**9** sampling locations (6 for the consolidated sludge pumps in the basement and 3 for each of the transformers). COCs include metals, VOCs, SVOCs, PCRs and PCBs (for transformers only).	ENV-BH33 ENV-BH33A ENV-BH34 ENV-BH34A ENV-BH35 ENV-BH35A ENV-BH36 ENV-BH36A ENV-BH36B
	Air Blower House (1307 m^2) + Transformer No. 1 to No. 4	- The Air Blower House consisted of air blower room to the east and switch / transformer room to the west. - The air blower room (approximately 504 m^2) housed 6 air blowers. Diesel and lubrication oil were used for their operation. Temporary oil drums storage were observed to the north of the air blower room. The room is paved with concrete and no stains were observed. - The switch room is located to the north of the switch / transformer room whereas the transformer room is located to the south. There are 4 transformers (labeled as Transformer No. 1 to No. 4). The room is paved with concrete and no stains were observed.	A22 and A23	**11** sampling locations proposed (6 for air blower room, 4 for each of the transformers and 1 for the temporary oil drums storage). COCs include metals, VOCs, SVOCs, PCRs and PCBs (for transformers only).	ENV-BH37 ENV-BH38 ENV-BH39 ENV-BH40 ENV-BH40A ENV-BH41 ENV-BH41A ENV-BH42 ENV-BH42A ENV-BH43 ENV-BH43A

Location (Site Area)	Concerned Area (approx. area)	Summary of Site Appraisal	Photo Reference in Appendix 2.03a	Necessity and Rationale for Intrusive Site Investigation (SI)	Proposed Borehole ID*
	Switchgear House (288 m^2) + Transformer No. 7 to 10 + CLP Transformer No. 2	- Reported by the site supervisor, the switchgear house were rarely been used. - Control panels were placed at the southeastern half of the building whereas 4 transformers (labeled as Transformer No. 7 to 10) were housed at the northwestern portion of the building. - The transformer rooms were concrete paved and no stains were observed on the floor. - There is a CLP Substation (labeled as 'CLP Transformer No. 2') near the Switchgear House. The substation was locked at the time of site inspection and access were not available.	A24	**5** sampling locations proposed for Transformer No. 7 to No. 10 and CLP Transformer No. 2. COCs include metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH44 ENV-BH45 ENV-BH46 ENV-BH47 ENV-BH48
	Effluent Pumping Station (619 m^2) + Transformer No. 25 and No. 26	- Four effluent pumps are situated in the station with size approximately 100m^2 (Water pump) - Site supervisor reported turbines that required use of lubricant is on the first floor and, the part based on ground floor is only use as a pipe for water transfer - There are 2 transformers (labeled as Transformer No. 25 to No. 26) near the Effluent Pumping Station. The transformers are on an elevated concrete platform of approximately 0.5m thick. No stains were observed on the floor.	A25 and A26	No land contamination was found within the Effluent Pumping Station. **2** sampling locations proposed for Transformer No. 25 and No. 26. COCs include metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH49 ENV-BH50
	Sludge Dewatering House (1340 m^2)	- The whole building is concrete paved and no stain or spillage was observed during the site walk. - Eight centrifuges were situated on the first floor and only control panels are on the ground floor.	A27	No land contamination were found within the ground floor, intrusive SI was considered not necessary.	N/A
	Water Reclamation House (312 m^2) + Transformer No. 23 and No. 24	- Major part of the building is used as information center for visitor. - The remaining portion are used for water reclamation (e.g. ultrafiltration and reverse osmosis system). - There are 2 transformers (labeled as Transformer No. 23 and 24) for the Water Reclamation House. The transformers are on an elevated concrete platform of approximately 0.5m thick. No stains were observed on the floor.	A28 and A29	No land contamination were found within the Water Reclamation House. **2** sampling locations proposed for Transformer No. 23 and No. 24. COCs include metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH51 ENV-BH52
	Sludge Transfer Pumping Station (475 m^2)	- Sludge transfer pumping station performs as a hub for sludge treatment, incoming sludge transfer to those sludge holding tanks through the station. - The whole building is concrete paved, sludge feed pumps are located on the first floor of the building and transferring water pipes are situated on the ground floor and basement. - No apparent stains were observed.	A30	No land contamination was found within the ground floor of the Sludge Transfer Pumping Station.	N/A

Location (Site Area)	Concerned Area (approx. area)	Summary of Site Appraisal	Photo Reference in Appendix 2.03a	Necessity and Rationale for Intrusive Site Investigation (SI)	Proposed Borehole ID*
	RAS Pumping Stations (168 m^2 per station)	- 5 RAS pumping stations were located in the treatment plant. - All five stations are concrete paved, control panels and pipe lines are located on the ground floor, pumps are located on the first floor of the station. As reported by the site supervisor no lubricant was being used for pumps.	A31	No land contamination were found within the ground floor, intrusive SI was considered not necessary.	N/A
Part of Existing VDC within the Project boundary (approx. 36,000m^2) (Inspection Date: 14 Nov 2014 & 30 Nov 2015)	Temporary Storage Area of Spent Batteries (100 m^2)	- The whole area was paved with additional layer of concrete above the concrete ground. - No stain and stressed vegetation were observed and no past records of leakage of battery solution.	B6.1	**3** sampling location proposed for the temporary storage area of spent batteries. COCs include metals.	ENV-BH53 ENV-BH54 ENV-BH55
	Storage area of seized goods (100 m^2)	- Only empty containers were stored in the area. - The whole area was concrete paved. - No stain and stressed vegetation were observed and no past records of leakage of chemicals.	B5	**3** sampling locations proposed for the storage areas of seized goods. COCs include metals, VOCs, SVOCs, PCRs and PCBs.	ENV-BH56 ENV-BH57 ENV-BH58

3 SAMPLING AND TESTING PLAN FOR SITE INVESTIGATION

3.1 Site Investigation Location

3.1.1.1 Sampling points are proposed at the hotspot areas as shown in **Table 2.3**. In addition, a 100 x 100m regular grid sampling arrangement, complying with Table 2.1 of EPD Practice Guide, is proposed for the remaining areas of STSTW.

3.1.1.2 From the above, a total of 108 sampling locations are proposed to study the vertical profile of possible contamination within existing STSTW and part of existing VDC within the Project boundary. The sampling locations are illustrated in **Figure 60334056/CAP/2.01** and detailed in **Table 3.1**. The exact sampling locations are subject to fine adjustment according to the actual site conditions and existence of underground structures/utilities. Chemicals of Concern (COCs) proposed for laboratory analysis included metals, VOCs, SVOCs, PCRs and PCBs. The sampling and testing plan with rationale are summarized in **Table 3.1**.

Table 3.1 Sampling and Testing Plan

Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2]		Parameters to be Tested[3]				
					PCR	VOC	SVOC	PCBs	Metals
STSTW									
ENV-BH01	Target potential hotspot area at the Chemical Wastes Store	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH02	Target potential hotspot area at the Dangerous Goods Store	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH03	Target potential hotspot area at the Chemical Waste Area	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH04	Target potential hotspot area at the Scrap Iron Storage Area	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH05	Target potential hotspot area at the Chemical Waste Collecting Tank	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH06 ENV-BH07 ENV-BH08 ENV-BH09	Target potential hotspot area at the Mechanic Workshop	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√

Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2]		Parameters to be Tested[3]				
					PCR	VOC	SVOC	PCBs	Metals
ENV-BH10 ENV-BH11			GW	If present[4]	√	√	√		Mercury only
ENV-BH12 ENV-BH12A ENV-BH12B	Target potential hotspot area at CLP Transformer No.1, Transformer No. 19 and No. 20	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH13 ENV-BH14 ENV-BH15	Target potential hotspot area at the Chemical Store	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH16 ENV-BH17	Target potential hotspot area at the Fuel Oil Tanks	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH18	Target potential hotspot area the Diesel Filling Point	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH19 ENV-BH20 ENV-BH21 ENV-BH22 ENV-BH23 ENV-BH24 ENV-BH25	Target potential hotspot area at the Generator Room of the Power House	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only

Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2]		Parameters to be Tested[3]				
					PCR	VOC	SVOC	PCBs	Metals
ENV-BH26 ENV-BH27 ENV-BH28 ENV-BH29 ENV-BH30	Target potential hotspot area at the Air Blower Room of the Power House	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH31 ENV-BH32	Target potential hotspot area at Transformers No.21 and No.22	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH-T1 ENV-BH-T2 ENV-BH-T3 ENV-BH-T4 ENV-BH-T5 ENV-BH-T6 ENV-BH-T7 ENV-BH-T8	Target potential hotspot area at Transformer No. 11 to 18	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH33 ENV-BH33A ENV-BH34 ENV-BH34A ENV-BH35 ENV-BH36	Target potential hotspot area at the Consolidated Sludge Pumps at the basement of the Sludge Thickening House	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
ENV-BH35A ENV-BH36A ENV-BH36B	Target potential hotspot are at Transformer No. 5, No. 6 and Transformer A	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH37 ENV-BH38 ENV-BH39 ENV-BH40A	Target potential hotspot area at the Air Blower Room	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√

Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2]		Parameters to be Tested[3]				
					PCR	VOC	SVOC	PCBs	Metals
ENV-BH41A ENV-BH42A ENV-BH43A			GW	If present[4]	√	√	√		Mercury only
ENV-BH40 ENV-BH41 ENV-BH42 ENV-BH43	Target potential hotspot area at Transformer No.1 to No.4	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH44 ENV-BH45 ENV-BH46 ENV-BH47	Target potential hotspot area at Transformer No.7 to No.10	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH48	Target potential hotspot area at CLP Transformer No.2	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH49 ENV-BH50	Target potential hotspot area at Transformer No.25 to No.26	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only
ENV-BH51 ENV-BH52	Target potential hotspot area at Transformer No.23 to No.24	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only

Sampling Location ID[1]	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth[2]		Parameters to be Tested[3]				
					PCR	VOC	SVOC	PCBs	Metals
ENV-G1 to ENV-G31	Grid Sampling points for the whole STSTW (280,000m^2)	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√		√
			GW	If present[4]	√	√	√		Mercury only
VDC									
ENV-BH53 ENV-BH54 ENV-BH55	Target potential hotspot area at Temporary Storage Area of Spent Battery	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]					√
			GW	If present[4]					Mercury only
ENV-BH56 ENV-BH57 ENV-BH58	Target potential hotspot area at Storage Area of Seized Goods (Empty Containers)	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	(i) 0.5m bgs (ii) 1.5m bgs (iii) 3.0m bgs (iv) GW level or 6m bgs[4]	√	√	√	√	√
			GW	If present[4]	√	√	√	√	Mercury only

Remarks:
1. Please refer to **Figure 60334056/CAP/2.01 and 60334056/CAP/2.03** for locations.
2. bgs: below ground surface; GW: groundwater
3. The testing parameters refer to the parameters as shown in Table 2.1 – RBRGs for Soil & Soil Saturation Limit and Table 2.2 – RBRGs for Groundwater and Solubility Limit under PCR, VOCs, SVOCs, PCBs and Metals in the Guidance Manual. Since RBRG value of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis-(2-Ethylhexyl)phthalate, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene and Phenol were not available for groundwater, the captioned chemicals parameters would not be tested in groundwater sample.
4. The deepest depth of sampling should be above/near groundwater table or 6m bgs, whichever is shallower. Groundwater sample would only be collected if encountered.

3.2 Soil Sampling Method and Depth of Sampling

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

3.2.1.2 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 equipments, 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. Where there are suspected signs of contamination, extra samples should be taken for laboratory analysis.

3.2.1.3 For area where drilling of borehole is not possible (e.g. presence of underground utilizes, limitation of headroom space, etc.), trail pit to 3m bgl should be conducted as an alternative. At each trial pit sampling location, disturbed soil samples, using stainless steel hand tools, shall be taken at 0.5 m, 1.5 m and 3.0m below the prevailing ground level in order to delineate the vertical profile of contamination.

3.2.1.4 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.

3.3 Strata Logging

3.3.1.1 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.

3.4 Groundwater Sampling and Free Product Measurement

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

3.4.1.2 At each borehole location, a groundwater sampling well should be installed unless agreed otherwise by the land contamination specialist. A typical design of a groundwater monitoring well is shown in **Appendix 3.01**. 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.

3.4.1.3 For trial pit, if groundwater is encountered, a groundwater sample should be taken after all required soil samples at each trial pit have been collected. The trial pits shall be pumped to near dry and allowed to stand for 24 hours before sampling.

3.4.1.4 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.

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

3.4.1.6 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.

3.4.1.7 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.

3.5 Sample Size and Decontamination Procedures

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

3.5.1.2 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.

3.5.1.3 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.

3.5.1.4 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.

3.6 QA/QC Procedures

3.6.1.1 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 as shown in Table 3.1;
- 1 field blank per 20 samples for full suite analysis as shown in Table 3.1;
- 1 duplicate soil sample per 20 soil samples and 1 duplicate groundwater sample per 20 groundwater samples for corresponding parameters analysis as shown in Table 3.1; and
- 1 trip blank sample per 10 trips for petroleum carbon range C_6-C_8.

3.6.1.2 Based on the sampling and testing plan as outlined in Table 3.1 and depending on the site condition, approximately 324 soil samples and 108 groundwater samples will be collected. The total number of equipment blanks and field blanks would therefore be about 21 each and the number of duplicate soil samples and groundwater samples would be 16 and 5 respectively. The number of trip blanks will be dependent on the number of trips for sample delivery.

3.7 Health and Safety

3.7.1.1 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).

3.7.1.2 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.

3.7.1.3 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.

3.7.1.4 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.

4 LABORATORY ANALYSIS

4.1.1.1 **Table 4.1** 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.

Table 4.1 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	2		20	
Metals					
33	Antimony	1	USEPA 6020	NA	NA
34	Arsenic	1		NA	
35	Barium	1		NA	
36	Cadmium	0.2		NA	
37	Chromium III^	1	By calculation	NA	
38	Chromium VI	1	APHA 3500Cr: D	NA	
39	Cobalt	1	USEPA 6020	NA	
40	Copper	1		NA	
41	Lead	1		NA	
42	Manganese	1		NA	
43	Mercury	0.2	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	
Petroleum Carbon Ranges					
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	
PCBs					
51	PCBs	0.1	USEPA 8270	1	USEPA 8270

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.

4.1.1.2 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.

5 INTERPRETATION OF RESULTS

5.1.1.1 With reference to the Guidance Note, interpretation of results should make reference to the Guidance Manual. The laboratory results for the soil and groundwater samples collected for this assessment will be compared with Risk-based Remediation Goals (RBRGs) as stipulated in Table 2.1 and Table 2.2 of the Guidance Manual.

5.1.1.2 The RBRGs are 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 are developed for four different land use scenarios reflecting the typical physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater. A description of each land use scenario is as follows:

- Urban residential – Sites located in an urban area where main activities involve habitation by individuals. The typical physical setting is a high rise residential building situated in a housing estate that has amenity facilities such as landscaped yards and children's playgrounds. The receptors are residents who stay indoors most of the time except for a short period each day, during which they are outdoors and have the chance of being in direct contact with soil at landscaping or play areas within the estate.

- Rural residential – Sites located in a rural area where the main activities involve habitation by individuals. These sites typically have village-type houses or low rise residential blocks surrounded by open space. The receptors are rural residents who stay at home and spend some time each day outdoors on activities such as gardening or light sports. The degree of contact with the soil under the rural setting is more than that under the urban setting both in terms of the intensity and frequency of contact.

- Industrial – Any site where activities involve manufacturing, chemical or petrochemical processing, storage of raw materials, transport operations, energy production or transmission, etc. Receptors include those at sites where part of the operation is carried out directly on land and the workers are more likely to be exposed to soil than those working in multi-storey factory buildings.

- Public parks – Receptors include individuals and families who frequent parks and play areas where there is contact with soil present in lawns, walkways, gardens and play areas. Parks are considered to be predominantly hard covered with limited areas of predominantly landscaped soil. Furthermore, public parks are not considered to have buildings present on them.

5.1.1.3 In addition to the RBRGs, screening criteria (soil saturation limits, Csat, developed for Non-aqueous Phase Liquid (NAPL) in soil and water solubility limits for NAPL in groundwater) for the more mobile organic chemicals must be considered to determine whether a site requires further action.

5.1.1.4 For the existing STSTW, the preliminary idea at present is that the site would be used for housing development or other beneficial uses to improve the community and environment. Community facilities and recreation areas such as waterfront promenade would also be considered. The Urban Residential Land Use Scenario (i.e. the more stringent of Urban Residential / Public Parks) is recommended as the land contamination assessment criteria for this type of land uses. However, in case where the re-development include more sensitive land uses (e.g. village-type houses, low-rise residential blocks surrounded by open space and schools), the Rural Residential Land Use Scenario will be appropriate

for the assessment. For the existing VDC, as the future land uses had not been determined at this stage in time, the most stringent set of RBRGs is recommended as the land contamination assessment criteria. Referring to **Section 7** below, a review of the validity of this CAP will be carried out prior to the site investigation works at existing STSTW and part of existing VDC within the Project boundary. A review of the appropriate Land Use Scenario for the land contamination assessment is also recommended to be conducted at the time.

5.1.1.5 The corresponding RBRGs levels, Soil Saturation Limit and the Solubility Limit are presented in **Appendix 5.01**.

6 EVALUATION OF POTENTIAL LAND CONTAMINATION IMPACT AND POSSIBLE REMEDIATION MEASURES

6.1 Evaluation of Potential Land Contamination Impact

6.1.1.1 Based on the site appraisal, contamination (if any) would likely be restricted to the identified hotspots within the existing STSTW and the temporary spent batteries / seized goods storage areas within VDC. Although the STSTW had been operated for over 30 years, preliminary SI works conducted under the Feasibility Study did not indicate any contamination exceeding the relevant RBRGs. Together with the fact that a large portion of the STSTW was only vegetation or access roads, extensive contamination is not expected within the site. For VDC, the size of the temporary spent batteries storage area and seized goods storage area are small (approximately 100m^2 for each area) and there were no past records and apparent chemical leakage, extensive contamination within the part of existing VDC within the Project boundary are therefore not expected.

6.1.1.2 The land contamination assessment and remediation works for STSTW and part of existing VDC within the Project boundary would need to follow 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 works under the project. Land contamination impacts are therefore considered not insurmountable to future occupants if the recommended actions as outlined in Section 7 were followed and contaminated soil and groundwater (if any) were properly treated using appropriate remediation methods and according to EPD's approved RAP.

6.1.1.3 For the remaining areas of CSTW Site, no land contaminating activities associated with current or historical land uses were identified. Land contamination impacts are therefore not anticipated within these areas. Having said that, as David Camp is inaccessible at the time of reporting, further site walkover is recommended to be conducted within the site when access to the camp site is available in order to confirm the presence of any land contamination. Recommended actions for these sites are also outlined in Section 7.

6.2 Possible Remediation Measures

6.2.1.1 The actual remediation methods could only be determined after completion of the SI works and EPD's agreement on the Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) at the later stage of the Project. The latter will provide details of the remedial actions for the identified contaminated soil and groundwater.

6.2.1.2 Nevertheless, based on the site appraisal, hotspots were identified within the existing STSTW and part of the existing VDC within the Project boundary. The potential COCs include metals, VOCs, SVOCs, PCRs and PCBs. For contaminated soil, there are a number of technologies commercially available to tackle the identified COCs. Technologies that are commonly used in Hong Kong are biopiling and cement solidification/stabilization. These ex-situ methods were proven to be effective in treating the target COCs and the treated soil could then be reused on site (e.g. backfilling materials). Given the size of the existing STSTW (approximately 28 ha), there would be sufficient space available to handle and treat the contaminated soil and the two methods are considered to be appropriate for the Project.

6.2.1.3 For groundwater, remediation is not commonly required as contaminants in groundwater seldom exceed the land contamination criteria (i.e. Risk-Based-Remediation Goals (RBRGs)) and non-aqueous phase liquid (NAPL) do not often present in groundwater. Contaminants in groundwater are often below the respective RBRGs as the potential risks that are posed to human receptors as a result of exposure to chemicals in groundwater is relatively low. This may be due to the fact that according to the EPD's Guidance Manual, groundwater in Hong Kong were not for drinking purposes and the

exposure pathway of contaminants in groundwater to human receptors would be associated with inhalation of volatiles rather than direct exposure. Having said that, there are examples of 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 indeed identified.

7 CONCLUSION AND WAY FORWARD

7.1.1.1 This CAP covered the CSTW Site and is prepared for the EIA Study.

7.1.1.2 A site appraisal, in the form of desktop review and site walkover, had been carried out to identify the potential contaminative land uses and hotspot areas within the CSTW Site. Based on the site appraisal, the existing STSTW and the temporary spent batteries / seized goods storage areas within VDC is considered to be areas with land contamination concerns.

7.1.1.3 A sampling and testing programme, targeting the existing STSTW and part of existing VDC within the Project boundary had been proposed. A total of 108 locations were proposed for soil and groundwater sample collection. The collected samples will be tested for the COCs: SVOCs, VOCs, metals, petroleum carbon ranges and/or PCBs.

7.1.1.4 Based on the latest programme, the existing STSTW and VDC will continue to operate until decommissioning in 2027 and 2017 respectively. Since the sites will continue to operate for quite some time, the change in operation which lead to any new or the relocation of contamination hotspots or occurrence of spillage or accident is not foreseeable, therefore, the proposed SI works and any necessary remediation action are recommended to be carried out after decommissioning of existing STSTW and part of the existing VDC within the Project boundary but prior to the re-development. Prior to the commencement of the SI works, a review on this CAP will be conducted to confirm whether the proposed SI works (e.g. sampling locations, testing parameters etc.) are still valid and to determine the appropriateness of the RBRGs land use scenario for the development. A supplementary CAP, presenting the findings of the review, will be submitted to EPD for endorsement. The supplementary CAP, SI works and the subsequent submission of CAR/RAP would tentatively be carried out around 2027 to 2028 for STSTW and 2017 for VDC. Remediation action, if necessary, will be carried out according to EPD endorsed RAP and a Remediation Report (RR) will be submitted after completion of the remediation action but prior to the commencement of any construction works or re-development of the site for EPD's endorsement.

7.1.1.5 For David Camp, further site walkover is recommended within the site when access to the camp site is available to confirm any apparent land contamination. If apparent land contamination were noted, detailed land contamination assessment, including submission of supplementary CAP, SI works and subsequent submission of CAR/RAP to EPD for endorsement, would be required. If necessary, remediation action and submission of RR to EPD will be carried out prior to the commencement of any construction works or re-development of the sites. The further site walkover and, if required, detailed land contamination assessment, are expected to be carried in 2018.

CAP Figures

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Approved:

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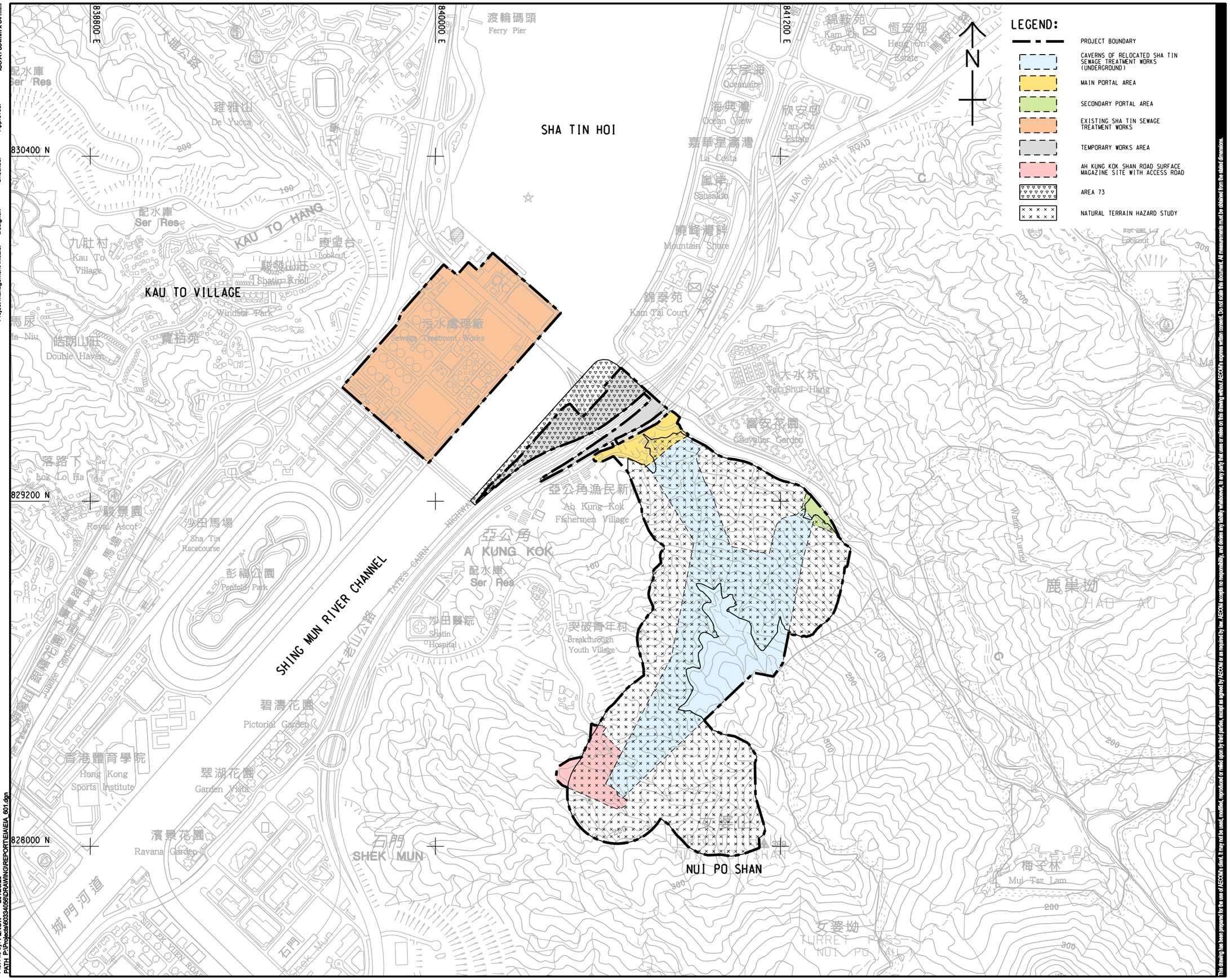
Designer:

Project Management Initiials:



AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
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I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核查

STATUS
階段

SCALE
比例

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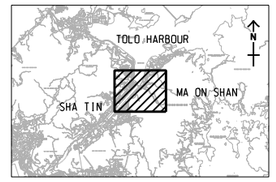
DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

A3 1 : 500000



PROJECT NO.
項目編號

60334056

CONTRACT NO.
合約編號

CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

PROJECT LOCATION AND WORKS AREA

SHEET NUMBER
圖紙編號

60334056/CAP/1.01

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

LEGEND:

- BOUNDARY OF EXISTING SHA TIN SEWAGE TREATMENT WORK
- ENV-G01 — SAMPLING LOCATION (GRID)
- ENV-BH01 — SAMPLING LOCATION (HOT SPOT)
- CONCERNED HOTSPOT AREA
- PROPOSED SAMPLING GRID

INSET 'A'

840200 E

839800 E

830000 N

829950 N

829400 N

TOLO HIGHWAY

吐露港公路

SHUI CHONG STREET

BOUNDARY OF EXISTING SHA TIN SEWAGE TREATMENT WORK

ACCOMMODATION BLOCKS

ENV-G01

ENV-G02

ENV-G03

ENV-G04

ENV-G05

ENV-G06

ENV-G07

ENV-G08

ENV-G09

ENV-G10

ENV-G11

ENV-G12

ENV-G13

ENV-G14

ENV-G15

ENV-G16

ENV-G17

ENV-G18

ENV-G19

ENV-G20

ENV-G21

ENV-G22

ENV-G23

ENV-G24

ENV-G25

ENV-G26

ENV-G27

ENV-G28

ENV-G29

ENV-G30

ENV-G31

FINAL SEDIMENTATION TANKS

CLP TRANSFORMER NO.1

ENV-BH12

RAS PUMPING STATION NO.1

RAS PUMPING STATION NO.2

RAS PUMPING STATION NO.3

RAS PUMPING STATION NO.4

RAS PUMPING STATION NO.5

ADMINISTRATION BUILDING

LABORATORY BUILDING

ENV-BH12A

ENV-BH12B

TRANSFORMER NO.19 & NO.20

MECHANIC WORKSHOP

DANGEROUS GOODS STORE

CHEMICAL WASTE STORE

SCRAP IRON STORAGE AREA

CHEMICAL WASTE COLLECTING TANK

CHEMICAL WASTE AREA

ENV-BH01

ENV-BH02

ENV-BH03

ENV-BH04

ENV-BH05

ENV-BH06

ENV-BH07

ENV-BH08

ENV-BH09

ENV-BH10

ENV-BH11

TRANSFORMER NO.7-NO.10

CLP TRANSFORMER NO.2

SWITCHGEAR HOUSE

ENV-BH44

ENV-BH45

ENV-BH46

ENV-BH47

ENV-BH48

EFFLUENT PUMPING STATION

ENV-BH49

ENV-BH50

TRANSFORMER NO.25 & NO.26

UV DISINFECTION CHAMBER

WSD SALT WATER PUMPING STATION (NOT WITHIN STUDY AREA)

SWITCH ROOM

ENV-BH43

ENV-BH42

ENV-BH41

ENV-BH40

ENV-BH41A

ENV-BH40A

ENV-BH37

ENV-BH43A

ENV-BH42A

ENV-BH39

ENV-BH38

TRANSFORMER NO.1-NO.4

OIL DRUM STORAGE

SLUDGE DEWATERING HOUSE

AIR BLOWER ROOM

AIR BLOWER HOUSE

AIR BLOWER ROOM

SLUDGE STORAGE TANKS

WATER RECLAMATION HOUSE

ENV-BH51

ENV-BH52

SLUDGE TRANSFER PUMPING STATION

TRANSFORMER NO.23 & NO.24

KIU HA ROAD

TAI'E'S CAIRN HIGHWAY

TRANSFORMER NO.11 & NO.12

ENV-BH-T1

ENV-BH-T2

TRANSFORMER NO.13 - NO.18

ENV-BH-T3

ENV-BH-T4

ENV-BH-T5

ENV-BH-T6

ENV-BH-T7

ENV-BH-T8

CHEMICAL STORE

TRANSFORMER NO.21 & NO.22

ENV-BH13

ENV-BH14

ENV-BH15

ENV-BH16

ENV-BH17

ENV-BH18

ENV-BH19

ENV-BH20

ENV-BH21

ENV-BH22

ENV-BH23

ENV-BH24

ENV-BH25

ENV-BH26

ENV-BH27

ENV-BH28

ENV-BH29

ENV-BH30

ENV-BH31

ENV-BH32

AIR BLOWER ROOM

FUEL OIL TANKS

DIGESTION TANKS

BOILER HOUSE

GENERATOR ROOM

POWER HOUSE

TEMPORARY CHEMICAL WASTE COLLECTING POINT

DIESEL FILLING POINT

SHA TIN SEWAGE TREATMENT WORKS

SHA TIN SEWAGE TREATMENT WORKS

AERATION TANKS

SLUDGE HOLDING TANKS

GAS HOLDERS

DIGESTION TANKS

CONSOLIDATED SLUDGE PUMPS (BASEMENT)

ENV-BH33

ENV-BH33A

ENV-BH34

ENV-BH34A

ENV-BH35

ENV-BH35A

ENV-BH36

ENV-BH36A

ENV-BH36B

SLUDGE THICKENING HOUSE

TRANSFORMER A

TRANSFORMER NO.5 & NO.6

WASTE GAS BURNER

FERRIC CHLORIDE STORAGE AND DOSING SYSTEM

GRIT CLASSIFIERS

INLET WORKS

PRIMARY SEDIMENTATION TANKS

AERATED GRIT CHANNEL NO.5

FLUME CHANNEL NOS. 7 & 8

SODIUM HYDROXIDE STORAGE AND DOSING SYSTEM

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PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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狀況

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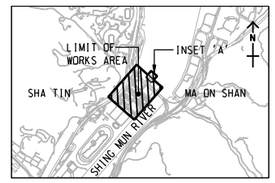


PROJECT NO. 項目編號
60334056

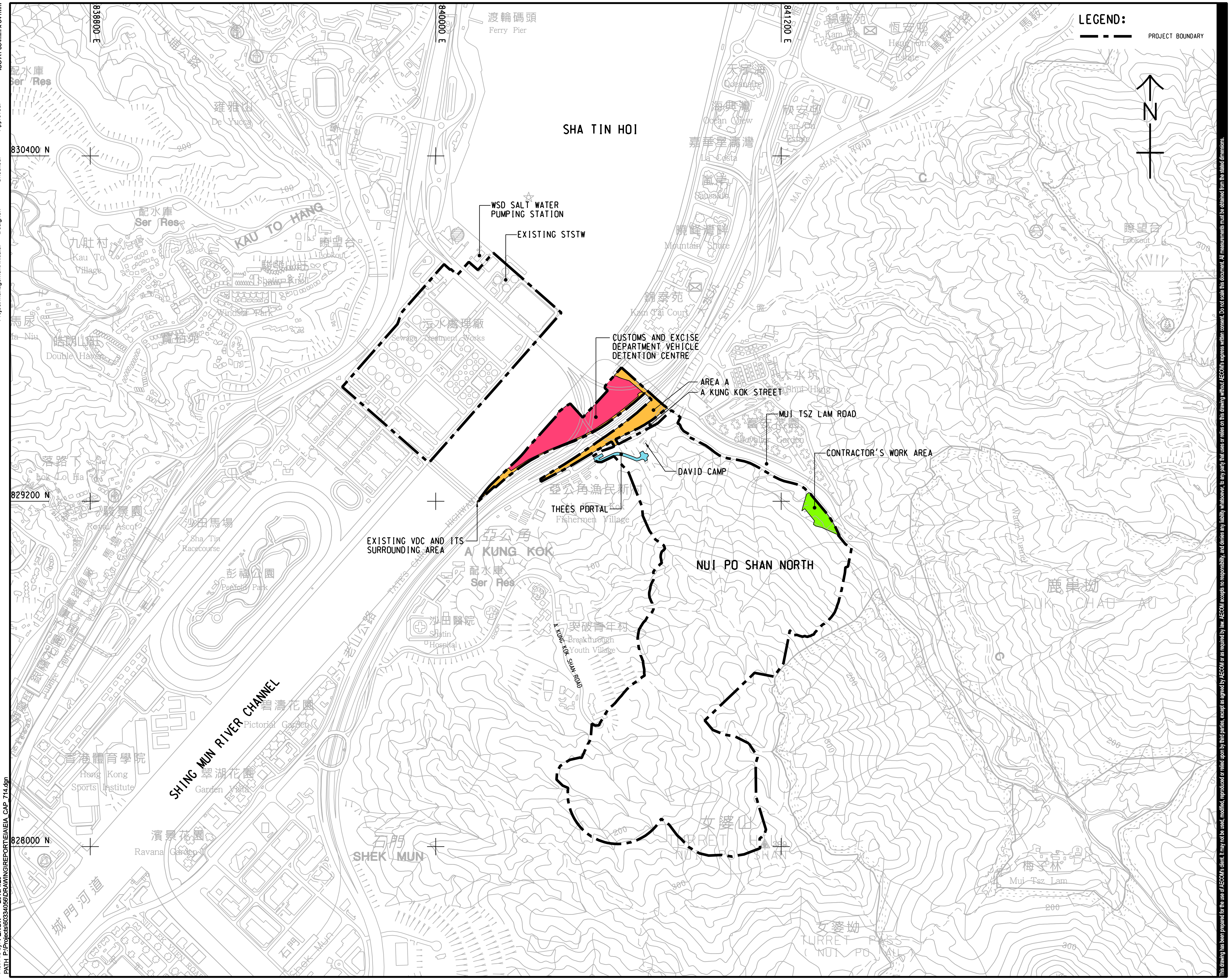
CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

GENERAL SITE LAYOUT OF EXISTING STSTW AND PROPOSED SAMPLING LOCATIONS

SHEET NUMBER
圖紙編號

60334056/CAP/2.01



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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核

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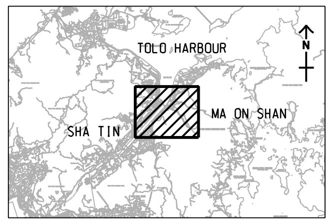

PROJECT NO. 項目編號 60334056

CONTRACT NO. 合約編號 CE 30/2014 (DS)

SHEET TITLE 圖紙名稱

GENERAL SITE LAYOUT OF EXISTING STSTW, EXISTING VEHICLE DETENTION CENTRE AND ITS SURROUNDING AREAS AND NIU PO SHAN NORTH

SHEET NUMBER 圖紙編號

60334056/CAP/2.02

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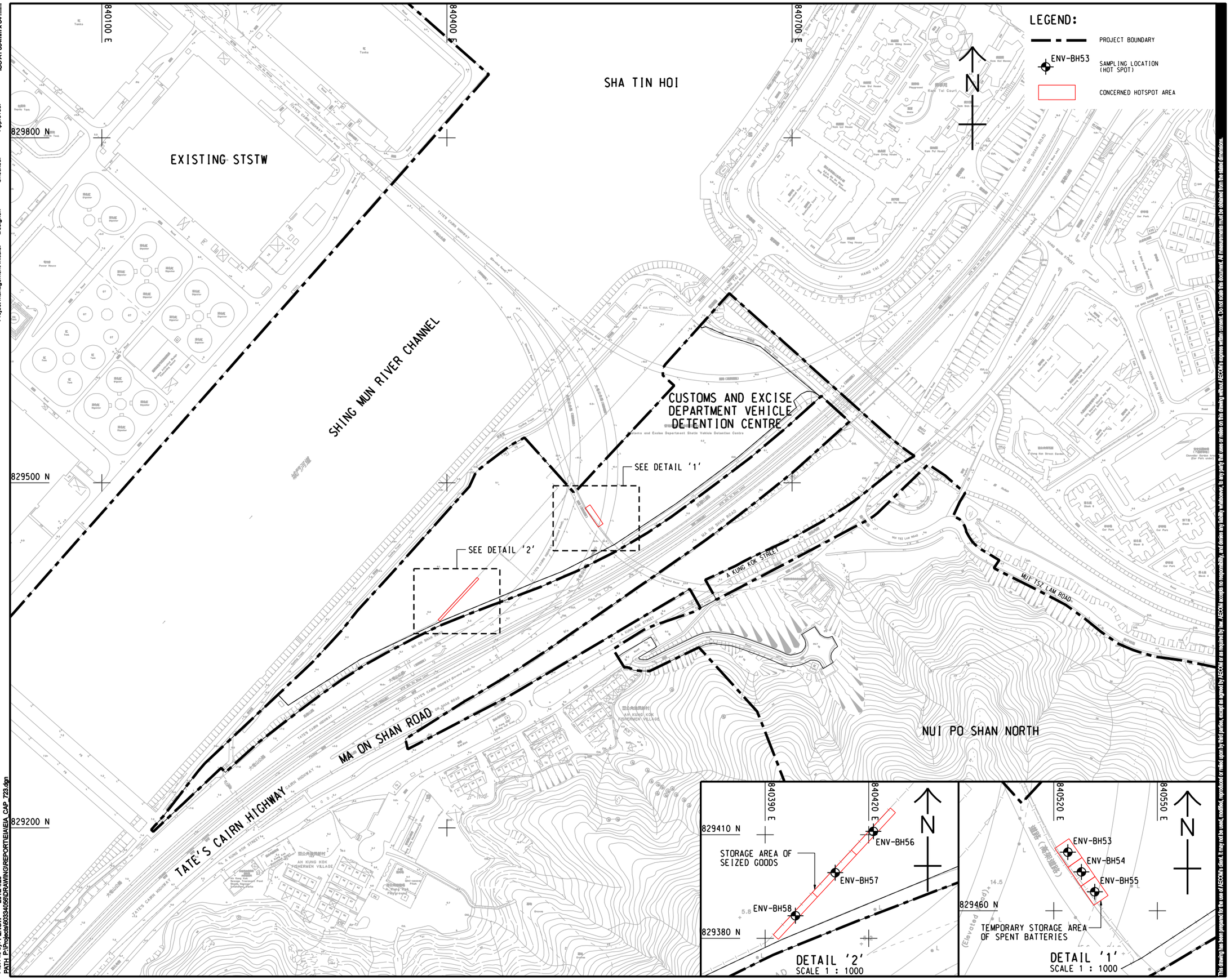

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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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Drainage Services Department

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ISSUE/REVISION
修訂

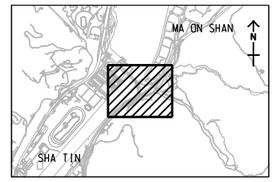
I/R 參訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核核

STATUS
階段

SCALE 比例
A3 1 : 3000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A3 1 : 100000



PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE 圖紙名稱
GENERAL SITE LAYOUT OF EXISTING VEHICLE DETENTION CENTRE AND PROPOSED SAMPLING LOACTIONS

SHEET NUMBER 圖紙編號
60334056/CAP/2.03

CAP Appendix 2.01

As-Built Sampling Locations and Extract of Sampling and Testing Details from the Feasibility Study

[BLANK]

ISO A3 297mm X 420mm

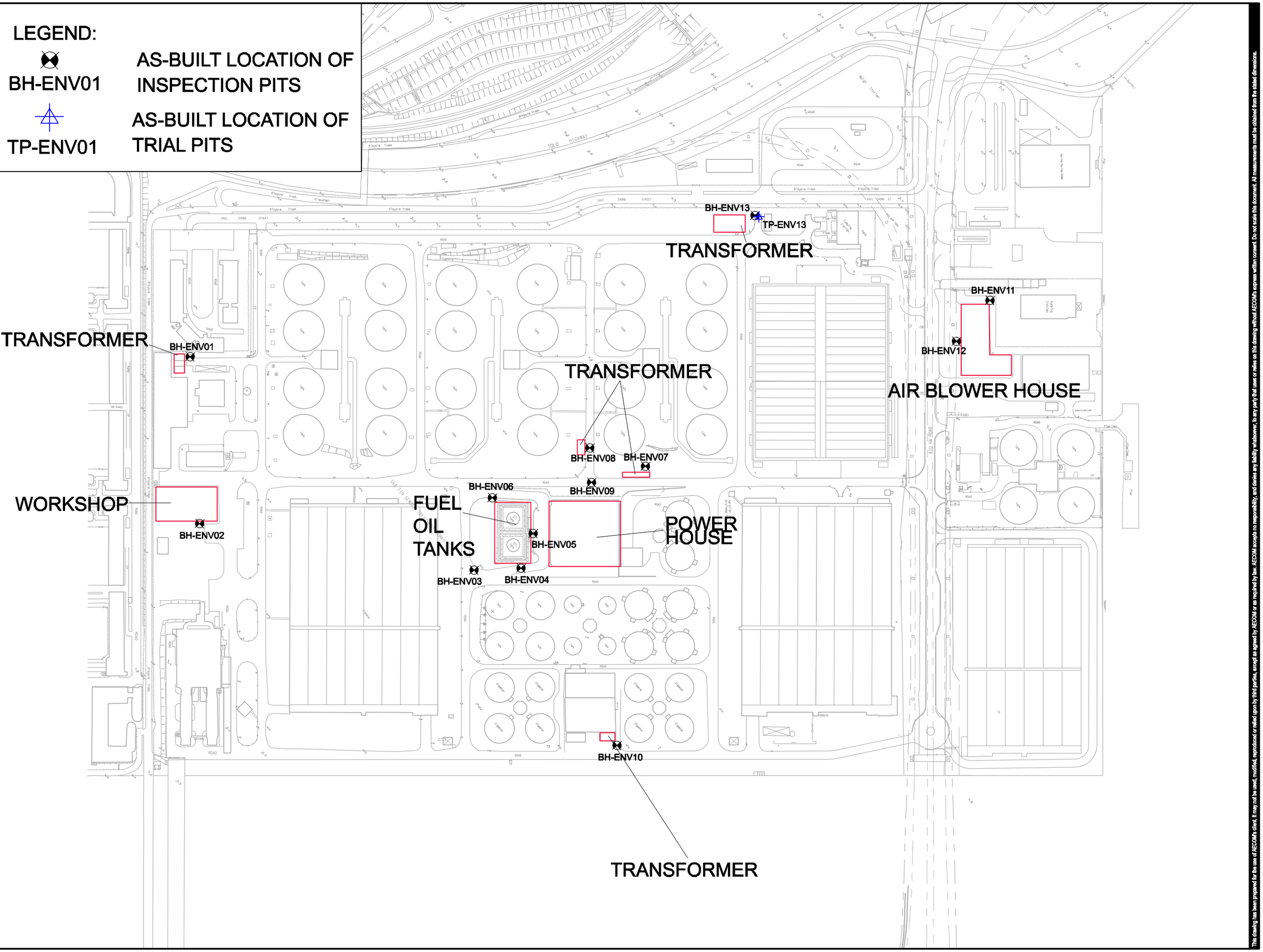
Checked: —

Project Management Initials:

LEGEND:

BH-ENV01 — AS-BUILT LOCATION OF INSPECTION PITS

TP-ENV01 — AS-BUILT LOCATION OF TRIAL PITS



Plot File by: LLHY 18NOV14
PATH P:\60334056\1.01\CAD\Drawing\

AECOM

FIGURE 1

AS-BUILT SAMPLING LOCATIONS

AGREEMENT NO. CE 30/2014 (DS)
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS
CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, D&C

Project No.: 60269233 Date: NOV. 2014

Appendix 10.02 of the Feasibility Study

Schedule of Laboratory Chemical Testing on Soil Samples

Project: Agreement No. CE 43/2011 (DS)
Relocation of Sha Tin Sewerage Treatment Works to Caverns – Feasibility Study
Client: CE/SP, DSD

Schedule of Laboratory Chemical Test on Soil Samples

			BTEX				SVOC																PCR		
Sample location/ Investigation Station No.	Sample type (grab, vibrocore etc.) & sample diameter (if applicable)	Sample Depth (from -m to m below existing ground level	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
BH-ENV01	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV01	Grab (Distributed Sample)	1.0					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV01	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV02	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV02	Grab (Distributed Sample)	1.0					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV02	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV03	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV03	Grab (Distributed Sample)	1.0					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV03	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Form completed by: _William Wong___ ~~Department~~/Consultant*: AECOM_____ Date: _ 11 June 2013 __

Project: Agreement No. CE 43/2011 (DS)
Relocation of Sha Tin Sewerage Treatment Works to Caverns – Feasibility Study
Client: CE/SP, DSD

			BTEX				SVOC																PCR		
Sample location/ Investigation Station No.	Sample type (grab, vibrocore etc.) & sample diameter (if applicable)	Sample Depth (from -m to m below existing ground level	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
BH-ENV04	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV04	Grab (Distributed Sample)	1.0					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV04	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV05	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV05	Grab (Distributed Sample)	1.0					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV05	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV06	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV06	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV06	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV07	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Form completed by: _William Wong___ ~~Department~~/Consultant*: AECOM_____ Date: _ 11 June 2013 __

Project: Agreement No. CE 43/2011 (DS)
Relocation of Sha Tin Sewerage Treatment Works to Caverns – Feasibility Study
Client: CE/SP, DSD

			BTEX				SVOC																PCR		
Sample location/ Investigation Station No.	Sample type (grab, vibrocore etc.) & sample diameter (if applicable)	Sample Depth (from -m to m below existing ground level	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
BH-ENV07	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV07	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV08	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV08	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV08	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV09	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV09	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV09	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV10	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV10	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Form completed by: _William Wong___ ~~Department~~/Consultant*: AECOM_____ Date: _11 June 2013__

CIVIL ENGINEERING DEVELOPMENT DEPARTMENT
CONTRACT NO. GE/2009/16 – CHEMICAL AND BIOLOGICAL TESTING (SERVICE CONTRACT)
SERVICE ORDER NO. GE/2009/16.XX

Project: Agreement No. CE 43/2011 (DS)
Relocation of Sha Tin Sewerage Treatment Works to Caverns – Feasibility Study
Client: CE/SP, DSD

			BTEX				SVOC																PCR		
Sample location/ Investigation Station No.	Sample type (grab, vibrocore etc.) & sample diameter (if applicable)	Sample Depth (from -m to m below existing ground level	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
BH-ENV10	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV11	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV11	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV11	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV12	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV12	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV12	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV13	Grab (Distributed Sample)	0.5					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BH-ENV13	Grab (Distributed Sample)	1					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Form completed by: _William Wong___ ~~Department~~/Consultant*: AECOM_____ Date: _11 June 2013__

Project: Agreement No. CE 43/2011 (DS)
Relocation of Sha Tin Sewerage Treatment Works to Caverns – Feasibility Study
Client: CE/SP, DSD

			BTEX				SVOC																PCR		
Sample location/ Investigation Station No.	Sample type (grab, vibrocore etc.) & sample diameter (if applicable)	Sample Depth (from -m to m below existing ground level	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
BH-ENV13	Grab (Distributed Sample)	3.0 or interface of water table					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Will be selected on site	Duplicate soil samples (i.e. total two (2)	To be selected on site					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Will be selected on site	Equipment Blank samples (i.e. total one (1))	NA					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Will be selected on site	Trip Blank samples (i.e. total one (1))	NA	x	x	x	x																	x		

Form completed by: _William Wong___ ~~Department~~/Consultant*: AECOM_____ Date: _ 11 June 2013 __

Appendix 10.03 of the Feasibility Study

Soil Boring Logs

DRiLTECH

TRIAL PIT RECORD

CONTRACT NO. GE/2011/25

TRIAL PIT NO. TP-ENV13

SHEET 1 of 1

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)

WORKS ORDER NO. GE/2011/25.15A

CO-ORDINATES E 839961.59 N 829937.42

EXCAVATION DATES: 22.07.2013 to 24.07.2013

BACKFILL DATES: 02.08.2013 to 02.08.2013

GROUND LEVEL: +5.28 mPD

LOGGED S.L. Chiu

DATE 30.07.2013

CHECKED R. Chu

DATE 31.07.2013

SAMPLES and TESTS	DEPTH (m)	LEGEND	GRADE	DESCRIPTION
	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
	0.25			Angular, greyish brown (10YR 5/2), sandy fine to coarse GRAVEL of rock fragments. (FILL)
1	0.41			Firm, brown (7.5YR 4/4) spotted grey and black, slightly silty sandy CLAY with some angular fine to coarse gravel and cobble of quartz and rock fragments and with occasional refuse, asphalt and concrete fragments. (FILL)
2	0.85			Angular, brown (7.5YR 4/4) mottled pink, slightly sandy fine to coarse GRAVEL of rock fragments. (FILL)
	1.15			At 0.95m: P1: Grey (10YR 5/1), a concrete pipe with 700mm in diameter.
				End of trial pit at maximum depth of 1.15 m.

SKETCH

FACE A: 1.50 m

FACE B: 1.50 m

FACE C: 1.50 m

FACE D: 1.50 m

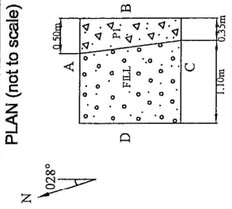
REMARKS

Maximum Depth: 1.15 m
Shoring: NO
Water Seepage: NO

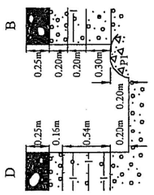
Average Depth: 1.15 m
Stability: STABLE

1. Small disturbed samples were taken at 0.50m and 1.00m.

PLAN (not to scale)



SECTION (not to scale)



SMALL DISTURBED SAMPLE

LARGE DISTURBED SAMPLE

U76 SAMPLE (VERTICAL / HORIZONTAL)

U100 SAMPLE (VERTICAL / HORIZONTAL)

BLOCK SAMPLE

IN-SITU DENSITY TEST

WATER SAMPLE

WATER SEEPAGE

N-SCHMIDT HAMMER TEST

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. GE/2011/25

PIT NO. BH-ENV01

SHEET 1 of 1

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)

WORKS ORDER NO. GE/2011/25.15A

DATE 29.06.2013 to 02.07.2013

CO-ORDINATES E 839763.11 N 829554.48

METHOD MANUAL EXCAVATION

GROUND LEVEL +6.33 mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
29.06.2013			+6.33	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+6.23	0.10			Angular, greyish brown (10YR 5/2), slightly clayey silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
29.06.2013	Dry at 1800	1 0.45					
02.07.2013	Dry at 0800		+5.88	0.45			Dense, yellowish red (5YR 5/8), slightly silty clayey fine to coarse SAND with some angular fine to coarse gravel of rock fragments. (FILL)
							At bottom: Grey (10YR 6/1) mottled brown, CONCRETE.
02.07.2013	Dry at 1800	2 0.80	+5.48	0.85			End of inspection pit at 0.85 m.

1

2

3

SMALL DISTURBED SAMPLE

LARGE DISTURBED SAMPLE

WATER SAMPLE

U76 SAMPLE

U100 SAMPLE

LOGGED S.L. Chiu

DATE 05.07.2013

CHECKED R. Chu

DATE 15.07.2013

REMARKS

1. Small disturbed samples were taken at 0.50m and 0.85m.
2. Environmental samples were taken at 0.50m and 0.83m.
3. The inspection pit was backfilled on 12 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV02**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **27.06.2013** to **29.06.2013**

CO-ORDINATES
E **839860.82**
N **829473.24**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+6.37** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
27.06.2013			+6.37	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+6.27	0.10			Grey (10YR 6/1), CONCRETE. (CONCRETE SUBBASE)
			+6.09	0.28			Dense, brown (7.5YR 5/4), slightly clayey silty fine to coarse SAND with some angular to subangular fine to coarse gravel and occasional cobble of rock fragments. (FILL)
27.06.2013	Dry at 1800	1 0.45					
28.06.2013	Dry at 0800						
28.06.2013	Dry at 1800	2 0.95					
29.06.2013	Dry at 0800						
		▲ 1.15					
		3 1.45					
29.06.2013	1.15 at 1800	4 1.70	+4.62	1.75			End of inspection pit at 1.75 m.

‡ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m and 1.75m.
2. Environmental samples were taken at 0.50m, 1.00m and 1.10m.
3. Groundwater sample was taken at 1.15m.
4. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV03**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **26.06.2013**

CO-ORDINATES
E **840016.15**
N **829611.81**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.23** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+5.23	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+5.00	0.23			Angular to subangular, greyish brown (10YR 5/2), slightly sandy fine to coarse GRAVEL of rock fragments. (FILL)
26.06.2013	Dry at 1800	1 0.28	+4.90	0.33			At bottom: Grey (10YR 6/1) mottled brown, CONCRETE. End of inspection pit at 0.33 m.

‡ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **28.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed sample was taken at 0.33m.
2. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV03A**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **11.07.2013** to **12.07.2013**

CO-ORDINATES
E **840009.62**
N **829614.33**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.19** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11.07.2013	Dry at 1800	1 0.45	+5.19	0.00			Dense, brown (10YR 5/3), slightly clayey silty fine to coarse SAND with some angular fine to coarse gravel of rock fragments and with some roots. (FILL) From 0.45m to 0.60m: Grey, a PVC pipe with 160mm in diameter.
12.07.2013	Dry at 0800						
	0.85	0.85					
12.07.2013	at 1800	2 0.95	+4.19	1.00			End of inspection pit at 1.00 m.

SMALL DISTURBED SAMPLE
LARGE DISTURBED SAMPLE
WATER SAMPLE
U76 SAMPLE
U100 SAMPLE

LOGGED **S.L. Chiu**
DATE **12.07.2013**
CHECKED **R. Chu**
DATE **13.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m and 1.00m.
2. Environmental samples were taken at 0.50m and 0.80m.
3. Groundwater sample was taken at 0.85m.
4. The inspection pit was backfilled on 2 August 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV04**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **28.06.2013**

CO-ORDINATES
E **840036.89**
N **829634.61**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+6.20** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+6.20	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+6.00	0.20			Angular to subangular, grey (10YR 5/1), slightly silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
			+5.80	0.40			
26.06.2013	Dry at 1800	1 0.45					Dense, brown (7.5YR 5/4), slightly silty fine to coarse SAND with occasional to some angular to subangular fine to coarse gravel and cobble of rock fragments and with occasional refuse fragments. (FILL) At bottom: Angular to subangular, greyish brown (10YR 5/2), coarse GRAVEL and occasional cobble of rock fragments. (FILL)
27.06.2013	Dry at 0800						
27.06.2013	Dry at 1800	2 0.95					
28.06.2013	Dry at 0800						
		3 1.45					
28.06.2013	Dry at 1800	4 1.60	+4.55	1.65			End of inspection pit at 1.65 m.

SMALL DISTURBED SAMPLE
LARGE DISTURBED SAMPLE
WATER SAMPLE
U76 SAMPLE
U100 SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m and 1.65m.
2. Environmental samples were taken at 0.50m and 1.00m.
3. The inspection pit was backfilled on 2 August 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV04A**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **23.07.2013** to **29.07.2013**

CO-ORDINATES
E **840038.91**
N **829625.63**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.98** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
23.07.2013			+5.98	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+5.82	0.16			Dense, brown (7.5YR 4/4) spotted light brown and grey, slightly silty clayey fine to coarse SAND with some to much angular fine to coarse gravel and cobble of rock fragments. (FILL)
23.07.2013	Dry at 1800	1 ↕ 0.45	+5.58	0.40			Firm, brown (7.5YR 4/4), silty sandy CLAY with some angular fine to coarse gravel of quartz and rock fragments. (FILL)
29.07.2013	Dry at 0800						
1		2 ↕ 0.95	+5.08	0.90			Dense, brown (7.5YR 4/4) spotted light brown and grey, slightly silty clayey fine to coarse SAND with some to much angular fine to coarse gravel and cobble of rock fragments. (FILL) From 1.40m to 1.60m: Partially with a boulder (<350mm) sized concrete fragment with steel bar reinforcement.
		3 ↕ 1.45					
29.07.2013	1.80 at 1800	▲ 1.80	+4.08	1.90			
2							End of inspection pit at 1.90 m.
3							

↕ SMALL DISTURBED SAMPLE ▨ U76 SAMPLE

↨ LARGE DISTURBED SAMPLE ▩ U100 SAMPLE

▲ WATER SAMPLE

LOGGED **S.L. Chiu**

DATE **30.07.2013**

CHECKED **R. Chu**

DATE **31.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m and 1.50m.
2. Environmental samples were taken at 0.50m, 1.00m and 1.80m.
3. Groundwater sample was taken at 1.80m.
4. The inspection pit was backfilled on 2 August 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV05**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **29.06.2013**

CO-ORDINATES
E **840026.61**
N **829661.33**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+6.91** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+6.91	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+6.77	0.14			Angular to subangular, brown (7.5YR 5/4), slightly clayey silty sandy fine to coarse GRAVEL of rock fragments and with some concrete fragments. (FILL)
26.06.2013	Dry at 1800	1 ↕ 0.45					
27.06.2013	Dry at 0800		+6.11	0.80			Firm, brown (7.5YR 4/4), silty sandy CLAY with some angular to subangular fine to coarse gravel and occasional cobble of rock fragments and with some concrete fragments. (FILL)
27.06.2013	Dry at 1800	2 ↕ 0.95					
28.06.2013	Dry at 0800						
		3 ↕ 1.45	+5.51	1.40			Dense, brown (7.5YR 4/4), slightly clayey silty fine to coarse SAND with some angular to subangular fine to coarse gravel and cobble of rock fragments and with some concrete fragments. (FILL) From 1.40m to 2.40m: Partially with grey (10YR 6/1) mottled brown, CONCRETE.
2		4 ↕ 1.95					
28.06.2013	Dry at 1800						
29.06.2013	Dry at 0800	5 ↕ 2.45					
29.06.2013	2.73 at 1800	6 ↕ 2.70 ▲ 2.73	+4.16	2.75			
3							End of inspection pit at 2.75 m.

↕ SMALL DISTURBED SAMPLE ▨ U76 SAMPLE

↨ LARGE DISTURBED SAMPLE ▩ U100 SAMPLE

▲ WATER SAMPLE

LOGGED **S.L. Chiu**

DATE **29.06.2013**

CHECKED **R. Chu**

DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 2.75m.
2. Environmental samples were taken at 0.50m, 1.00m and 2.50m.
3. Groundwater sample was taken at 2.73m.
4. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV06**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **27.06.2013**

CO-ORDINATES
E **839985.50**
N **829654.19**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.21** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+5.21	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+4.91	0.30			Angular to subangular, grey (10YR 5/1) spotted brown, slightly sandy fine to coarse GRAVEL of rock fragments. (FILL)
26.06.2013	Dry at 1800	1 ↕ 0.45					At bottom: Grey (10YR 6/1) mottled brown, CONCRETE.
27.06.2013	Dry at 0800						
27.06.2013	Dry at 1800	2 ↕ 0.69	+4.47	0.74			End of inspection pit at 0.74 m.

↕ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **28.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m and 0.74m.
2. Environmental samples were taken at 0.50m and 0.73m.
3. The inspection pit was backfilled on 12 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV07**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **02.07.2013**

CO-ORDINATES
E **840048.60**
N **829755.53**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.66** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+5.66	0.00			Firm, reddish brown (5YR 5/4), streaked dark brown, slightly sandy silty CLAY with occasional angular to subangular fine to coarse gravel of rock fragments and with occasional decayed wood fragments. (FILL)
26.06.2013	Dry at 1800	1 ↕ 0.45					At 1.20m: Dark grey, a steel pipe with approx. 450mm in diameter.
27.06.2013	Dry at 0800						
27.06.2013	Dry at 1800	2 ↕ 0.95					
28.06.2013	Dry at 0800						
28.06.2013	Dry at 1800	3 ↕ 1.45					
02.07.2013	Dry at 0800	▲ 1.60					
02.07.2013	1.60 at 1800	4 ↕ 1.75	+3.88	1.80			End of inspection pit at 1.80 m.

↕ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m and 1.80m.
2. Environmental samples were taken at 0.50m, 1.00m and 1.50m.
3. Groundwater sample was taken at 1.60m.
4. The inspection pit was backfilled on 9 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV08**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **26.06.2013** to **26.06.2013**

CO-ORDINATES
E **839996.83**
N **829738.67**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.07** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+5.07	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
							At bottom: Grey (10YR 6/1) mottled brown, CONCRETE.
26.06.2013	Dry at 1800	1 ↕ 0.30	+4.72	0.35			End of inspection pit at 0.35 m.

↕ SMALL DISTURBED SAMPLE ▨ U76 SAMPLE
↕ LARGE DISTURBED SAMPLE ■ U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS
1. Small disturbed sample was taken at 0.35m.
2. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV08A**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **11.07.2013** to **12.07.2013**

CO-ORDINATES
E **839995.69**
N **829740.88**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.09** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11.07.2013			+5.09	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+4.99	0.10			Angular, greyish brown (10YR 5/2), slightly silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
11.07.2013	Dry at 1800	1 ↕ 0.45	+4.74	0.35			Dense, brown (7.5YR 4/4) spotted light reddish brown, slightly clayey silty fine to coarse SAND with some angular fine to coarse gravel of rock fragments. (FILL)
12.07.2013	Dry at 0800						
		▲ 0.90					
12.07.2013	0.90 at 1800	2 ↕ 0.95	+4.04	1.05			End of inspection pit at 1.05 m.

↕ SMALL DISTURBED SAMPLE ▨ U76 SAMPLE
↕ LARGE DISTURBED SAMPLE ■ U100 SAMPLE
▲ WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **12.07.2013**
CHECKED **R. Chu**
DATE **13.07.2013**

REMARKS
1. Small disturbed samples were taken at 0.50m and 1.00m.
2. Environmental samples were taken at 0.50m and 0.85m.
3. Groundwater sample was taken at 0.90m.
4. The inspection pit was backfilled on 2 August 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV09**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

CO-ORDINATES E **840025.49** N **829724.22**

METHOD **MANUAL EXCAVATION**

DATE **26.06.2013** to **28.06.2013**

GROUND LEVEL **+5.07** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
26.06.2013			+5.07	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+4.99	0.08			Angular to subangular, brown (7.5YR 4/4), slightly clayey silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
			+4.72	0.35			Firm, light reddish brown (5YR 6/3), clayey sandy SILT with occasional to some angular fine to coarse gravel and occasional cobble of rock fragments. (FILL)
26.06.2013	Dry at 1800	1 0.45					
27.06.2013	Dry at 0800						
127.06.2013	1.00 at 1800	2 0.95					
28.06.2013	1.00 at 0800	▲ 1.00					
28.06.2013	1.00 at 1800	3 1.45					
		4 1.55	+3.47	1.60			End of inspection pit at 1.60 m.

SMALL DISTURBED SAMPLE
LARGE DISTURBED SAMPLE
WATER SAMPLE
U76 SAMPLE
U100 SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m and 1.60m.
2. Environmental samples were taken at 0.50m and 0.90m.
3. Groundwater sample was taken at 1.00m.
4. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV10**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

CO-ORDINATES E **840187.38** N **829602.99**

METHOD **MANUAL EXCAVATION**

DATE **27.06.2013** to **11.07.2013**

GROUND LEVEL **+6.34** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
27.06.2013			+6.34	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+6.12	0.22			Angular to subangular, greyish brown (10YR 5/2), slightly silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
			+5.92	0.42			Stiff, brown (10YR 5/3), slightly sandy silty CLAY with occasional angular to subangular fine to coarse gravel of rock fragments. (FILL)
27.06.2013	Dry at 1800	1 0.45					
28.06.2013	Dry at 0800						
128.06.2013	Dry at 1800	2 0.95					
29.06.2013	Dry at 0800						
		3 1.45	+4.74	1.60			Dense, brown (10YR 5/3), slightly clayey silty fine to coarse SAND with much angular to subangular fine to coarse gravel of rock fragments. (FILL)
		4 1.95					At 1.80m: Partially with a boulder of moderately decomposed granite fragments.
		▲ 2.20					
29.06.2013	2.20 at 1800	5 2.45					
11.07.2013	2.20 at 0800						
311.07.2013	2.20 at 1800	6 2.95	+3.34	3.00			End of inspection pit at 3.00 m.

SMALL DISTURBED SAMPLE
LARGE DISTURBED SAMPLE
WATER SAMPLE
U76 SAMPLE
U100 SAMPLE

LOGGED **S.L. Chiu**
DATE **29.06.2013**
CHECKED **R. Chu**
DATE **06.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m.
2. Environmental samples were taken at 0.50m, 1.00m and 3.00m.
3. Groundwater sample was taken at 2.20m.
4. The inspection pit was backfilled on 2 August 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV11**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **29.06.2013** to **03.07.2013**

CO-ORDINATES
E **840117.20**
N **830025.06**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.43** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
29.06.2013			+5.43	0.00			Grey (10YR 5/1), CONCRETE with steel reinforcement. (TRAFFIC ROAD)
			+5.19	0.24			Angular, grey (10YR 5/1) mottled brown, sandy fine to coarse GRAVEL of rock fragments. (FILL)
29.06.2013	Dry at 1800	1 ↕ 0.45	+4.95	0.48			
02.07.2013	Dry at 0800						Dense, yellowish red (5YR 5/6) and dark brown (7.5YR 3/4), slightly clayey silty fine to coarse SAND with some to much angular fine to medium gravel of rock fragments. (FILL)
1		2 ↕ 0.95					
		3 ↕ 1.45					
202.07.2013	Dry at 1800	4 ↕ 1.95					
03.07.2013	Dry at 0800						
		5 ↕ 2.45					
303.07.2013	Dry at 1800	6 ↕ 2.95	+2.43	3.00			End of inspection pit at 3.00 m.

↕ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **05.07.2013**
CHECKED **R. Chu**
DATE **15.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m.
2. Environmental samples were taken at 0.50m, 1.00m and 3.00m.
3. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV12**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Cavers - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

DATE **29.06.2013** to **03.07.2013**

CO-ORDINATES
E **840108.15**
N **829999.93**

METHOD **MANUAL EXCAVATION**

GROUND LEVEL **+5.36** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
29.06.2013			+5.36	0.00			Grey (10YR 5/1), CONCRETE with steel reinforcement. (TRAFFIC ROAD)
			+5.11	0.25			Angular, grey (10YR 5/1) mottled brown, sandy fine to coarse GRAVEL of rock fragments. (FILL)
29.06.2013	Dry at 1800	1 ↕ 0.45	+4.85	0.51			
02.07.2013	Dry at 0800						Dense, yellowish red (5YR 5/8) and brown (10YR 5/3), slightly silty clayey fine to coarse SAND with some angular fine to coarse gravel of rock fragments. (FILL)
1		2 ↕ 0.95					
		3 ↕ 1.45	+3.86	1.50			Firm, yellowish red (5YR 5/8) spotted yellowish brown, silty sandy CLAY with some angular fine gravel of quartz and rock fragments. (FILL)
202.07.2013	Dry at 1800	4 ↕ 1.95					
03.07.2013	Dry at 0800						
03.07.2013	2.30 at 1800	▲ 2.30	+3.04	2.32			End of inspection pit at 2.32 m.
3							

↕ SMALL DISTURBED SAMPLE
U76 SAMPLE
LARGE DISTURBED SAMPLE
U100 SAMPLE
WATER SAMPLE

LOGGED **S.L. Chiu**
DATE **05.07.2013**
CHECKED **R. Chu**
DATE **15.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m and 2.00m.
2. Environmental samples were taken at 0.50m, 1.00m and 2.20m.
3. Groundwater sample was taken at 2.30m.
4. The inspection pit was backfilled on 11 July 2013.

DRiLTECH

INSPECTION PIT RECORD

CONTRACT NO. **GE/2011/25**

PIT NO. **BH-ENV13**

SHEET 1 of 1

PROJECT **Ground Investigation - New Territories East (Term Contract), Agreement No. CE 43/2011(DS), Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility (GI inside STSTW)**

WORKS ORDER NO. **GE/2011/25.15A**

CO-ORDINATES
E **839961.69**
N **829936.22**

METHOD **MANUAL EXCAVATION**

DATE **29.06.2013** to **02.07.2013**

GROUND LEVEL **+5.29** mPD

Excavation Progress	Water Level (m) Shift Start / End	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
29.06.2013			+5.29	0.00			Black (10YR 2/1), ASPHALT. (TRAFFIC ROAD)
			+5.07	0.22			Angular, greyish brown (10YR 5/2), slightly silty sandy fine to coarse GRAVEL of rock fragments. (FILL)
29.06.2013	Dry at 1800	1 ↕ 0.45	+4.84	0.45			Dense, yellowish red (5YR 5/8), slightly clayey silty fine to coarse SAND with some angular fine gravel of rock fragments. (FILL) At bottom: With some medium to coarse gravel of rock fragments.
02.07.2013	Dry at 0800						
1		2 ↕ 0.95					
02.07.2013	Dry at 1800	3 ↕ 1.15	+4.09	1.20			End of inspection pit at 1.20 m.
2							
3							

↕ SMALL DISTURBED SAMPLE
▮ LARGE DISTURBED SAMPLE
▲ WATER SAMPLE
▨ U76 SAMPLE
▩ U100 SAMPLE

LOGGED **S.L. Chiu**
DATE **05.07.2013**
CHECKED **R. Chu**
DATE **15.07.2013**

REMARKS

1. Small disturbed samples were taken at 0.50m, 1.00m and 1.20m.
2. Environmental samples were taken at 0.50m and 1.00m.
3. The inspection pit was backfilled on 2 August 2013.

Appendix 10.04 of the Feasibility Study

Summary of The Laboratory Testing Results of Soil and Groundwater

Summary Tables of The Laboratory Testing Result - Soil

Parameters			SVOC																Petroleum Carbon Ranges		
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
Unit			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	200	500
RBRGs of Urban Residentail			**3510**	**2340**	**10000***	**12**	**1.2**	**9.88**	**1800**	**120**	**871**	**1.2**	**2400**	**2380**	**12**	**182**	**10000***	**1800**	**1410**	**2240**	**10000***
Saturation Limit			**60.2**	**19.8**	**2.56**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**54.7**	**--**	**125**	**28**	**--**	**1000**	**3000**	**5000**
Sample Location	Sampling Depth (m bgs)	Date of Sampling																			
BH-ENV01	0.50	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BHENV01	0.83	11-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV02	0.50	28-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	1040
BH-ENV02	1.00	28-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV02	1.10	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV3A	0.50	11-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV3A	0.80	12-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV4A	0.50	29-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV4A	1.00	29-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV4A	1.80	29-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV05	0.50	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV05	1.00	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV05	2.50	3-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV06	0.50	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV06	0.73	11-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV07	0.50	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV07	1.00	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV07	1.50	28-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV8A	0.50	11-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV8A	0.85	12-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV09	0.50	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV09	0.90	28-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV10	0.50	27-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV10	1.00	28-Jun-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV10	3.00	11-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV11	0.50	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV11	1.00	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV11	3.00	3-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV12	0.50	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV12	1.00	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV12	2.20	3-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV13	0.50	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500
BH-ENV13	1.00	2-Jul-13	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<5	<200	<500

Note: bgs = Below ground surface

LOR= Level of Reporting

Summary Tables of The Laboratory Testing Results - Groundwater

			SVOC										Petroleum Carbon Ranges		
Parameters			Acenaphthene	Acenaphthylene	Anthracene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
Unit			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			2	2	2	1	1	2	2	2	2	2	20	500	500
RBRGs of Urban Residentail			10000000*	1410000	10000000*	539	58100	10000000*	10000000*	61700	10000000*	10000000*	82200	714000	12800
Saturation Limit			4240	3930	43.4	1.5	1.6	206	1980	31000	1000	135	5230	2800	2800
Sample Location	Sampling Depth (m bgs)	Date of Sampling													
BH-ENV02	1.15	2-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	1200
BH-ENV3A	0.85	12-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV4A	1.85	29-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV05	2.73	3-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV07	1.60	2-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV8A	0.90	12-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV09	1.00	2-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV10	2.20	16-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500
BH-ENV12	2.30	3-Jul-13	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<20	<500	<500

Note: bgs= below ground surface

LOR= Level of Reporting

Appendix 10.05 of the Feasibility Study

Laboratory Chemical Testing Report by ALS Technichem (HK) Pty Ltd

ALS Environmental

CEDD Contract No. GE/2012/24

Chemical and Biological Testing (Service Contract)

Service Order No. GE/2012/24.11

Agreement No. CE 43/2011(DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns – Feasibility Study
Provision of Chemical and Biological Testing Service

Laboratory Chemical Testing Report (Final Report)

Prepared for

Civil Engineering and Development Department

Prepared By

ALS Technichem (HK) Pty Ltd

August 23, 2013

CEDD Contract No. GE/2012/24

Chemical and Biological Testing (Service Contract)

Service Order No. GE/2012/24.11

Agreement No. CE 43/2011(DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns – Feasibility Study
Provision of Chemical and Biological Testing Service

Laboratory Chemical Testing Report (Final Report)

CLIENT:

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Mr Fung Lim Chee, Richard
Person Appointed to Act for the Contractor

Date: August 23, 2013

Contract No. GE/2012/24 Chemical and Biological Testing
Service Order No. GE/2012/24.11 Agreement No. CE 43/2011(DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns – Feasibility Study
Provision of Chemical and Biological Testing Service

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Section 1

Summary Reports

Summary of Soil Analytical Results

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

	Analytes	Total Petroleum Hydrocarbons (TPH)		
		C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
	Units	mg/kg	mg/kg	mg/kg
	LOR	5	200	500
ALS Lab ID	Sample ID	Sampling Date		
HK1317305002	BH-ENV05/ 0.5M	27/06/2013	<5	<200	<500
HK1317305003	BH-ENV06/ 0.5M	27/06/2013	<5	<200	<500
HK1317305004	BH-ENV07/ 0.5M	27/06/2013	<5	<200	<500
HK1317305005	BH-ENV09/ 0.5M	27/06/2013	<5	<200	<500
HK1317305006	BH-ENV10/ 0.5M	27/06/2013	<5	<200	<500
HK1317305008	BH-ENV05/ 1.0M	27/06/2013	<5	<200	<500
HK1317305009	BH-ENV07/ 1.0M	27/06/2013	<5	<200	<500
HK1317464001	BH-ENV10/ 1.0M	28/06/2013	<5	<200	<500
HK1317464002	BH-ENV02/ 0.5M	28/06/2013	<5	<200	1040
HK1317464003	BH-ENV02/ 1.0M	28/06/2013	<5	<200	<500
HK1317464004	BH-ENV09/ 0.9M	28/06/2013	<5	<200	<500
HK1317464005	BH-ENV07/ 1.5M	28/06/2013	<5	<200	<500
HK1317464006	BH-ENV07/ 1.5M(A)	28/06/2013	<5	<200	<500
HK1317464007	BH-ENV07/ 1.5M(B)	28/06/2013	<5	<200	<500
HK1317593001	BH-ENV12/ 0.5M	2/07/2013	<5	<200	<500
HK1317593002	BH-ENV11/ 0.5M	2/07/2013	<5	<200	<500
HK1317593003	BH-ENV13/ 0.5M	2/07/2013	<5	<200	<500
HK1317593004	BH-ENV01/ 0.5M	2/07/2013	<5	<200	<500
HK1317593005	BH-ENV12/ 1.0M	2/07/2013	<5	<200	<500
HK1317593006	BH-ENV11/ 1.0M	2/07/2013	<5	<200	<500
HK1317593007	BH-ENV13/ 1.0M	2/07/2013	<5	<200	<500
HK1317598001	BH-ENV11/ 3.0M	3/07/2013	<5	<200	<500
HK1317598002	BH-ENV12/ 2.2M	3/07/2013	<5	<200	<500
HK1317598003	BH-ENV5/ 2.5M	3/07/2013	<5	<200	<500
HK1317598004	BH-ENV2/ 1.1M	3/07/2013	<5	<200	<500
HK1318887002	BH-ENV3A 0.80M	12/07/2013	<5	<200	<500
HK1318887004	BH-ENV8A 0.85M	12/07/2013	<5	<200	<500
HK1318896001	BH-ENV10 3.0M	11/07/2013	<5	<200	<500
HK1318896002	BH-ENV06 0.73M	11/07/2013	<5	<200	<500
HK1318896003	BH-ENV01 0.83M	11/07/2013	<5	<200	<500
HK1318896004	BH-ENV3A 0.5M	11/07/2013	<5	<200	<500
HK1318896005	BH-ENV8A 0.5M	11/07/2013	<5	<200	<500
HK1320318001	BH-ENV4A 0.5M	29/07/2013	<5	<200	<500
HK1320318002	BH-ENV4A 1.0M	29/07/2013	<5	<200	<500
HK1320318003	BH-ENV4A 1.8M	29/07/2013	<5	<200	<500

Summary of Soil Analytical Results

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

	Analytes	Polycyclic Aromatic Hydrocarbons (PAHs)																
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	LOR	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ALS Lab ID	Sample ID	Sampling Date															
HK1317305002	BH-ENV05/ 0.5M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305003	BH-ENV06/ 0.5M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305004	BH-ENV07/ 0.5M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305005	BH-ENV09/ 0.5M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305006	BH-ENV10/ 0.5M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305008	BH-ENV05/ 1.0M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317305009	BH-ENV07/ 1.0M	27/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464001	BH-ENV10/ 1.0M	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464002	BH-ENV02/ 0.5M	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464003	BH-ENV02/ 1.0M	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464004	BH-ENV09/ 0.9M	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464005	BH-ENV07/ 1.5M	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464006	BH-ENV07/ 1.5M(A)	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317464007	BH-ENV07/ 1.5M(B)	28/06/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593001	BH-ENV12/ 0.5M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593002	BH-ENV11/ 0.5M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593003	BH-ENV13/ 0.5M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593004	BH-ENV01/ 0.5M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593005	BH-ENV12/ 1.0M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593006	BH-ENV11/ 1.0M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317593007	BH-ENV13/ 1.0M	2/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317598001	BH-ENV11/ 3.0M	3/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317598002	BH-ENV12/ 2.2M	3/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317598003	BH-ENV5/ 2.5M	3/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1317598004	BH-ENV2/ 1.1M	3/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318887002	BH-ENV3A 0.80M	12/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318887004	BH-ENV8A 0.85M	12/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318896001	BH-ENV10 3.0M	11/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318896002	BH-ENV06 0.73M	11/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318896003	BH-ENV01 0.83M	11/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318896004	BH-ENV3A 0.5M	11/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1318896005	BH-ENV8A 0.5M	11/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1320318001	BH-ENV4A 0.5M	29/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1320318002	BH-ENV4A 1.0M	29/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
HK1320318003	BH-ENV4A 1.8M	29/07/2013	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500

Page 1 of 1

Summary of Water Analytical Results

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

		Analytes	Total Petroleum Hydrocarbons (TPH)		
		Units	C6 - C8 Fraction	C9 - C16 Fraction	C17 - C35 Fraction
		LOR	µg/L	µg/L	µg/L
			20	500	500
ALS Lab ID	Sample ID	Sampling Date			
HK1317305011	TRIP BLANK	27/06/2013	<20	--	--
HK1317464008	EQUIPMENT BLANK	28/06/2013	<20	<500	<500
HK1317593008	BH-ENV07 (G.W) 1.6M	2/07/2013	<20	<500	<500
HK1317593009	BH-ENV09 (G.W) 1.0M	2/07/2013	<20	<500	<500
HK1317593010	BH-ENV02 (G.W) 1.15M	2/07/2013	<20	<500	1200
HK1317598005	BH-ENV12 (G.W) 2.3M	3/07/2013	<20	<500	<500
HK1317598006	BH-ENV5 (G.W) 2.73M	3/07/2013	<20	<500	<500
HK1318887001	BH-ENV3A (GW) 0.85M	12/07/2013	<20	<500	<500
HK1318887003	BH-ENV8A (GW) 0.9M	12/07/2013	<20	<500	<500
HK1319351001	BH-ENV10 (GW) 2.2M	17/07/2013	<20	<500	<500
HK1320318004	BH-ENV4A 1.85M (G.W)	29/07/2013	<20	<500	<500

Summary of Water Analytical Results

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

		Analytes	Polycyclic Aromatic Hydrocarbons (PAHs)															
			Naphthalene	Acenaphthylene	Acensphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		LOR	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
ALS Lab ID	Sample ID	Sampling Date																
HK1317305011	TRIP BLANK	27/06/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HK1317464008	EQUIPMENT BLANK	28/06/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0
HK1317593008	BH-ENV07 (G.W) 1.6M	2/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1317593009	BH-ENV09 (G.W) 1.0M	2/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1317593010	BH-ENV02 (G.W) 1.15M	2/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1317598005	BH-ENV12 (G.W) 2.3M	3/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1317598006	BH-ENV5 (G.W) 2.73M	3/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1318887001	BH-ENV3A (GW) 0.85M	12/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1318887003	BH-ENV8A (GW) 0.9M	12/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1319351001	BH-ENV10 (GW) 2.2M	17/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--
HK1320318004	BH-ENV4A 1.85M (G.W)	29/07/2013	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--	<1.0	<1.0	--	--	--	--	--

Summary of Water Analytical Results

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

		Analytes	Monocyclic Aromatic Hydrocarbons (MAH)					
			Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Xylenes (Total)
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		LOR	5	5	5	10	5	20
ALS Lab ID	Sample ID	Sampling Date						
HK1317305011	TRIP BLANK	27/06/2013	<5.0	<5.0	<5.0	<10	<5.0	<20
HK1317464008	EQUIPMENT BLANK	28/06/2013	--	--	--	--	--	--
HK1317593008	BH-ENV07 (G.W) 1.6M	2/07/2013	--	--	--	--	--	--
HK1317593009	BH-ENV09 (G.W) 1.0M	2/07/2013	--	--	--	--	--	--
HK1317593010	BH-ENV02 (G.W) 1.15M	2/07/2013	--	--	--	--	--	--
HK1317598005	BH-ENV12 (G.W) 2.3M	3/07/2013	--	--	--	--	--	--
HK1317598006	BH-ENV5 (G.W) 2.73M	3/07/2013	--	--	--	--	--	--
HK1318887001	BH-ENV3A (GW) 0.85M	12/07/2013	--	--	--	--	--	--
HK1318887003	BH-ENV8A (GW) 0.9M	12/07/2013	--	--	--	--	--	--
HK1319351001	BH-ENV10 (GW) 2.2M	17/07/2013	--	--	--	--	--	--
HK1320318004	BH-ENV4A 1.85M (G.W)	29/07/2013	--	--	--	--	--	--

Section 2

Certificate of Analysis

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 8
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1317305
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 27-JUN-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025602			No. of samples received	: 11
Site	: SHA TIN SEWAGE TREATMENT PLANT			No. of samples analysed	: 8

Hong Kong Accreditation Service (HKAS) has accedited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 04-JUL-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1317305**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.

Soil sample(s) were received in a chilled condition.

Water sample(s) analysed and reported on an as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV05/ 0.5M	BH-ENV06/ 0.5M	BH-ENV07/ 0.5M	BH-ENV09/ 0.5M	BH-ENV10/ 0.5M
				Client sampling date / time: [27-JUN-2013]	[27-JUN-2013]	[27-JUN-2013]	[27-JUN-2013]	[27-JUN-2013]
				HK1317305-002	HK1317305-003	HK1317305-004	HK1317305-005	HK1317305-006
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	5.4	3.1	15.5	18.7	9.9
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	<500
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	104	102	101	93.0	108
4-Terphenyl-d14	1718-51-0	0.1	%	103	101	100	100	90.8
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	90.0	91.4	91.4	89.8	89.9
Toluene-D8	2037-26-5	0.1	%	101	103	99.8	104	98.5
4-Bromofluorobenzene	460-00-4	0.1	%	100	97.3	99.7	99.8	96.2

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV05/ 1.0M	BH-ENV07/ 1.0M			
				Client sampling date / time: [27-JUN-2013]	[27-JUN-2013]			
				HK1317305-008	HK1317305-009			
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	13.4	16.1			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500			
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500			
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500			
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500			
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500			
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500			
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500			
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500			
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500			
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500			
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500			
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500			
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500			
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500			
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500			
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5			
C9 - C16 Fraction	----	200	mg/kg	<200	<200			
C17 - C35 Fraction	----	500	mg/kg	<500	<500			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	108	102			
4-Terphenyl-d14	1718-51-0	0.1	%	104	98.8			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	90.6	90.1			
Toluene-D8	2037-26-5	0.1	%	99.7	99.4			
4-Bromofluorobenzene	460-00-4	0.1	%	96.9	97.0			

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [27-JUN-2013] HK1317305-011				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	**97.8**				
Toluene-D8	2037-26-5	0.1	%	**103**				
4-Bromofluorobenzene	460-00-4	0.1	%	**96.2**				
EP-074_SR-S: VOC Surrogates								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	**97.8**				
Toluene-D8	2037-26-5	0.1	%	**103**				
4-Bromofluorobenzene	460-00-4	0.1	%	**96.2**				

Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2946160)								
HK1317305-001	BH-ENV04/ 0.5M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	7.2	6.7	6.9
HK1317350-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	12.3	12.3	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2945371)								
HK1317305-001	BH-ENV04/ 0.5M	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)								
HK1317305-001	BH-ENV04/ 0.5M	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945372)								
HK1317305-001	BH-ENV04/ 0.5M	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0

Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)								
HK1317305-011	TRIP BLANK	**C6 - C8 Fraction**	----	0.02	mg/L	<0.02	<0.02	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2945160)								
HK1317270-001	Anonymous	**Benzene**	71-43-2	0.5	µg/L	<0.5	<0.5	0.0
		Toluene	108-88-3	0.5	µg/L	31.4	33.2	5.7
		Ethylbenzene	100-41-4	0.5	µg/L	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	µg/L	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	<1	0.0
		Xylenes (Total)	----	2	µg/L	<2	<2	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **SOIL**

Method: Compound	CAS Number	Method Blank (MB) Report: LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	DCS	Recovery Limits (%): Low	High	RPD (%): Value	Control Limit

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2945371)											
Naphthalene	91-20-3	25	µg/kg	----	25 µg/kg	90.0	----	63	117	----	----
				<50	----	----	----	----	----	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.8	----	54	119	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	82.6	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	84.8	----	60	126	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.3	----	60	127	----	----
Anthracene	120-12-7	25	µg/kg	----	25 µg/kg	97.4	----	56	124	----	----
				<50	----	----	----	----	----	----	----
Fluoranthene	206-44-0	25	µg/kg	----	25 µg/kg	97.3	----	61	132	----	----
				<50	----	----	----	----	----	----	----
Pyrene	129-00-0	25	µg/kg	----	25 µg/kg	101	----	61	133	----	----
				<50	----	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	94.7	----	57	124	----	----
Chrysene	218-01-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	99.5	----	60	128	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	94.8	----	48	135	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.6	----	58	133	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	96.7	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	----	25 µg/kg	80.7	----	48	134	----	----
				<50	----	----	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	86.0	----	50	137	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	91.8	----	55	140	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	87.2	----	69	139	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945372)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	62.2	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	53.7	----	43	99	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	90.0	----	76	1134	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 2945160)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	106	----	58	126	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	101	----	63	124	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	93.0	----	62	123	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	102	----	66	126	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.7	----	62	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	102	----	65	126	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)										
HK1317305-002	BH-ENV05/ 0.5M	C6 - C8 Fraction	----	4.5 mg/kg	88.4	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945372)										
HK1317305-002	BH-ENV05/ 0.5M	C9 - C16 Fraction	----	32 mg/kg	74.5	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	73.4	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 8
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1317464
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
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Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 28-JUN-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H 025603			No. of samples received	: 8
Site	: SHA TIN SEWAGE TREATMENT PLANT			No. of samples analysed	: 8

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 08-JUL-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1317464**

Sample(s) were received in a chilled condition.

Water sample(s) analysed and reported on an as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV10/ 1.0M	BH-ENV02/ 0.5M	BH-ENV02/ 1.0M	BH-ENV09/ 0.9M	BH-ENV07/ 1.5M
				Client sampling date / time: [28-JUN-2013]	[28-JUN-2013]	[28-JUN-2013]	[28-JUN-2013]	[28-JUN-2013]
				HK1317464-001	HK1317464-002	HK1317464-003	HK1317464-004	HK1317464-005
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	16.0	11.7	12.8	14.0	19.2
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	1040	<500	<500	<500
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	99.5	97.9	84.9	99.5	95.7
4-Terphenyl-d14	1718-51-0	0.1	%	91.6	86.6	89.0	94.2	87.4
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	97.3	101	99.3	99.5	97.6
Toluene-D8	2037-26-5	0.1	%	97.6	98.5	98.5	98.7	97.5
4-Bromofluorobenzene	460-00-4	0.1	%	94.5	92.1	94.9	93.7	95.0

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV07/ 1.5M(A)	Client sampling date / time: [28-JUN-2013]	Client sample ID: BH-ENV07/ 1.5M(B)	Client sampling date / time: [28-JUN-2013]			
				HK1317464-006		HK1317464-007				
EA/ED: Physical and Aggregate Properties										
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	16.7		18.7				
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	91-20-3	0.500	mg/kg	<0.500		<0.500				
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500		<0.500				
Acenaphthene	83-32-9	0.500	mg/kg	<0.500		<0.500				
Fluorene	86-73-7	0.500	mg/kg	<0.500		<0.500				
Phenanthrene	85-01-8	0.500	mg/kg	<0.500		<0.500				
Anthracene	120-12-7	0.500	mg/kg	<0.500		<0.500				
Fluoranthene	206-44-0	0.500	mg/kg	<0.500		<0.500				
Pyrene	129-00-0	0.500	mg/kg	<0.500		<0.500				
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500		<0.500				
Chrysene	218-01-9	0.500	mg/kg	<0.500		<0.500				
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500		<0.500				
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500		<0.500				
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500		<0.500				
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500		<0.500				
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500		<0.500				
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500		<0.500				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)										
C6 - C8 Fraction	----	5	mg/kg	<5		<5				
C9 - C16 Fraction	----	200	mg/kg	<200		<200				
C17 - C35 Fraction	----	500	mg/kg	<500		<500				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates										Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	95.0		102				
4-Terphenyl-d14	1718-51-0	0.1	%	86.3		93.5				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate										Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	98.1		95.8				
Toluene-D8	2037-26-5	0.1	%	97.7		98.2				
4-Bromofluorobenzene	460-00-4	0.1	%	95.4		95.6				

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: EQUIPMENT BLANK	Client sampling date / time: [28-JUN-2013]					
				HK1317464-008						
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	91-20-3	2.0	µg/L	<2.0						
Acenaphthylene	208-96-8	2.0	µg/L	<2.0						
Acenaphthene	83-32-9	2.0	µg/L	<2.0						
Fluorene	86-73-7	2.0	µg/L	<2.0						
Phenanthrene	85-01-8	2.0	µg/L	<2.0						
Anthracene	120-12-7	2.0	µg/L	<2.0						
Fluoranthene	206-44-0	2.0	µg/L	<2.0						
Pyrene	129-00-0	2.0	µg/L	<2.0						
Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0						
Chrysene	218-01-9	1.0	µg/L	<1.0						
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0						
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0						
Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0						
Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0						
Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0						
Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0						
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)										
C6 - C8 Fraction	----	20	µg/L	<20						
C9 - C16 Fraction	----	500	µg/L	<500						
C17 - C35 Fraction	----	500	µg/L	<500						
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates										Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	51.2						
4-Terphenyl-d14	1718-51-0	0.1	%	82.8						
EP-080_SRS: TPH(Volatile)/BTEX Surrogate										Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	110						
Toluene-D8	2037-26-5	0.1	%	99.2						
4-Bromofluorobenzene	460-00-4	0.1	%	95.3						

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2950514)								
HK1317385-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	7.9	7.7	3.0
HK1317606-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	31.6	31.7	0.4
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554)								
HK1317606-001	Anonymous	Fluoranthene	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	<50	<50	0.0
		Anthracene	120-12-7	50	µg/kg	<50	<50	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)								
HK1317305-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)								
HK1317593-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)								
HK1317305-011	Anonymous	C6 - C8 Fraction	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554)											
Naphthalene	91-20-3	25	µg/kg	----	25 µg/kg	86.6	----	63	117	----	----
				<50	----	----	----	----	----	----	----
Acenaphthylene	208-96-8	25	µg/kg	----	25 µg/kg	79.2	----	54	119	----	----
				<50	----	----	----	----	----	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	92.5	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	25	µg/kg	----	25 µg/kg	96.6	----	60	126	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554) - Continued											
Fluorene	86-73-7	50	µg/kg	<50	----	----	----	----	----	----	----
Phenanthrene	85-01-8	25	µg/kg	----	25 µg/kg	98.9	----	60	127	----	----
				<50	----	----	----	----	----	----	----
Anthracene	120-12-7	25	µg/kg	----	25 µg/kg	97.9	----	56	124	----	----
				<50	----	----	----	----	----	----	----
Fluoranthene	206-44-0	25	µg/kg	----	25 µg/kg	93.6	----	61	132	----	----
				<50	----	----	----	----	----	----	----
Pyrene	129-00-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	91.6	----	61	133	----	----
Benz(a)anthracene	56-55-3	25	µg/kg	----	25 µg/kg	99.0	----	57	124	----	----
				<50	----	----	----	----	----	----	----
Chrysene	218-01-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.0	----	60	128	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.8	----	48	135	----	----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	----	25 µg/kg	96.7	----	58	133	----	----
				<50	----	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	86.3	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.0	----	48	134	----	----
Dibenz(a.h)anthracene	53-70-3	25	µg/kg	----	25 µg/kg	101	----	50	137	----	----
				<50	----	----	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	25	µg/kg	----	25 µg/kg	102	----	55	140	----	----
				<50	----	----	----	----	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	87.2	----	69	139	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	92.1	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	95.3	----	43	99	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	77.0	----	34	106	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	70.3	----	38	92	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	71.9	----	34	100	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	75.5	----	31	99	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	76.7	----	34	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	63.7	----	42	102	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	55	105	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	----	55	107	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617) - Continued											
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	94.4	----	45	107	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	94.9	----	65	121	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	95.4	----	52	102	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	104	----	66	121	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	90.8	----	55	115	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	99.0	----	40	127	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	100	----	41	109	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	94.8	----	47	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	90.0	----	76	1134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945439)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	52.6	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	49.6	----	4	130	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)										
HK1317305-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	88.4	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)										
HK1317593-002	Anonymous	C9 - C16 Fraction	----	32 mg/kg	85.0	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	78.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates - Continued			
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 9
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1317593
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Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 02-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025604			No. of samples received	: 10
Site	: SHA TIN SEWAGE TREATMENT PLANT			No. of samples analysed	: 10

Hong Kong Accreditation Service (HKAS) has accedited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	*Position*	*Authorised results for*
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General Comments
This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 08-JUL-2013
Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
Specific comments for Work Order: **HK1317593**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.
Sample(s) were received in a chilled condition.
Water sample(s) analysed and reported on an as received basis.
Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV12/ 0.5M	BH-ENV11/ 0.5M	BH-ENV13/ 0.5M	BH-ENV01/ 0.5M	BH-ENV12/ 1.0M
				Client sampling date / time: [02-JUL-2013]	[02-JUL-2013]	[02-JUL-2013]	[02-JUL-2013]	[02-JUL-2013]
				HK1317593-001	HK1317593-002	HK1317593-003	HK1317593-004	HK1317593-005
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	8.7	13.8	11.9	6.8	16.6
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	<500
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	77.4	83.6	91.0	77.1	82.2
4-Terphenyl-d14	1718-51-0	0.1	%	74.6	88.6	94.7	80.4	87.9
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	97.3	98.2	96.5	96.0	101
Toluene-D8	2037-26-5	0.1	%	98.0	99.2	98.4	96.9	98.5
4-Bromofluorobenzene	460-00-4	0.1	%	96.0	96.1	95.8	94.2	96.4

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV11/ 1.0M	BH-ENV13/ 1.0M
				Client sampling date / time: [02-JUL-2013]	[02-JUL-2013]
				HK1317593-006	HK1317593-007
EA/ED: Physical and Aggregate Properties					
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	15.2	15.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)					
C6 - C8 Fraction	----	5	mg/kg	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates					Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	80.4	81.2
4-Terphenyl-d14	1718-51-0	0.1	%	83.2	85.9
EP-080_SRS: TPH(Volatile)/BTEX Surrogate					Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	94.1	97.4
Toluene-D8	2037-26-5	0.1	%	98.7	98.6
4-Bromofluorobenzene	460-00-4	0.1	%	96.5	96.3

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV07 (G.W) 1.6M	BH-ENV09 (G.W) 1.0M	BH-ENV02 (G.W) 1.15M		
				Client sampling date / time: [02-JUL-2013]	[02-JUL-2013]	[02-JUL-2013]		
				HK1317593-008	HK1317593-009	HK1317593-010		
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0	<2.0	<2.0		
Acenaphthylene	208-96-8	2.0	µg/L	<2.0	<2.0	<2.0		
Acenaphthene	83-32-9	2.0	µg/L	<2.0	<2.0	<2.0		
Fluorene	86-73-7	2.0	µg/L	<2.0	<2.0	<2.0		
Phenanthrene	85-01-8	2.0	µg/L	<2.0	<2.0	<2.0		
Anthracene	120-12-7	2.0	µg/L	<2.0	<2.0	<2.0		
Fluoranthene	206-44-0	2.0	µg/L	<2.0	<2.0	<2.0		
Pyrene	129-00-0	2.0	µg/L	<2.0	<2.0	<2.0		
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0		
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20	<20	<20		
C9 - C16 Fraction	----	500	µg/L	<500	<500	<500		
C17 - C35 Fraction	----	500	µg/L	<500	<500	**1200**		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	**83.9**	**58.3**	**61.4**		
4-Terphenyl-d14	1718-51-0	0.1	%	**103**	**106**	**95.0**		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	**104**	**108**	**104**		
Toluene-D8	2037-26-5	0.1	%	**102**	**100**	**101**		
4-Bromofluorobenzene	460-00-4	0.1	%	**96.7**	**95.3**	**96.8**		

Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2953305)								
HK1317598-004	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	19.7	19.8	0.0
HK1317598-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	18.6	17.5	5.7
EA/ED: Physical and Aggregate Properties (QC Lot: 2953306)								
HK1317593-005	BH-ENV12/ 1.0M	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.6	17.2	3.2
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554)								
HK1317606-001	Anonymous	**Fluoranthene**	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	<50	<50	0.0
		Anthracene	120-12-7	50	µg/kg	<50	<50	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)								
HK1317305-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)								
HK1317593-001	BH-ENV12/ 0.5M	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)								
HK1317593-001	BH-ENV12/ 0.5M	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0

Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)								
HK1317305-011	Anonymous	**C6 - C8 Fraction**	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **SOIL**

Method: Compound	CAS Number	Method Blank (MB) Report: LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	DCS	Recovery Limits (%): Low	High	RPD (%): Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554)											
Naphthalene	91-20-3	25	µg/kg	---- <50	25 µg/kg ----	86.6 ----	---- ----	63 ----	117 ----	---- ----	---- ----
Acenaphthylene	208-96-8	25	µg/kg	----	25 µg/kg	79.2	----	54	119	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2950554) - Continued											
Acenaphthylene	208-96-8	50	µg/kg	<50	----	----	----	----	----	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	92.5	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	25	µg/kg	----	25 µg/kg	96.6	----	60	126	----	----
				<50	----	----	----	----	----	----	----
Phenanthrene	85-01-8	25	µg/kg	----	25 µg/kg	98.9	----	60	127	----	----
				<50	----	----	----	----	----	----	----
Anthracene	120-12-7	25	µg/kg	----	25 µg/kg	97.9	----	56	124	----	----
				<50	----	----	----	----	----	----	----
Fluoranthene	206-44-0	25	µg/kg	----	25 µg/kg	93.6	----	61	132	----	----
				<50	----	----	----	----	----	----	----
Pyrene	129-00-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	91.6	----	61	133	----	----
Benz(a)anthracene	56-55-3	25	µg/kg	----	25 µg/kg	99.0	----	57	124	----	----
				<50	----	----	----	----	----	----	----
Chrysene	218-01-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.0	----	60	128	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.8	----	48	135	----	----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	----	25 µg/kg	96.7	----	58	133	----	----
				<50	----	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	86.3	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	90.0	----	48	134	----	----
Dibenz(a.h)anthracene	53-70-3	25	µg/kg	----	25 µg/kg	101	----	50	137	----	----
				<50	----	----	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	25	µg/kg	----	25 µg/kg	102	----	55	140	----	----
				<50	----	----	----	----	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	87.2	----	69	139	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	92.1	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	95.3	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	89.0	----	69	139	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	77.0	----	34	106	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	70.3	----	38	92	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617) - Continued											
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	71.9	----	34	100	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	75.5	----	31	99	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	76.7	----	34	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	63.7	----	42	102	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	55	105	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	----	55	107	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	94.9	----	65	121	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	95.4	----	52	102	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	90.0	----	76	1134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945439)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	52.6	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	49.6	----	4	130	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945367)										
HK1317305-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	88.4	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)										
HK1317593-002	BH-ENV11/ 0.5M	C9 - C16 Fraction	----	32 mg/kg	85.0	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	78.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)										
HK1317593-002	BH-ENV11/ 0.5M	C6 - C8 Fraction	----	4.5 mg/kg	97.9	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 7
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1317598
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Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 03-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025605			No. of samples received	: 6
Site	: SHA TIN SEWAGE TREATMENT PLANT			No. of samples analysed	: 6

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

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General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 08-JUL-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1317598**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.

Sample(s) were received in a chilled condition.

Water sample(s) analysed and reported on an as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV11/ 3.0M	BH-ENV12/ 2.2M	BH-ENV5/ 2.5M	BH-ENV2/ 1.1M	
				Client sampling date / time: [03-JUL-2013]	[03-JUL-2013]	[03-JUL-2013]	[03-JUL-2013]	
				HK1317598-001	HK1317598-002	HK1317598-003	HK1317598-004	
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	18.6	23.7	18.9	19.7	
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	92.7	101	94.4	96.4	
4-Terphenyl-d14	1718-51-0	0.1	%	85.7	90.8	87.4	91.0	
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	99.3	98.7	96.8	98.2	
Toluene-D8	2037-26-5	0.1	%	97.7	97.9	98.1	98.8	
4-Bromofluorobenzene	460-00-4	0.1	%	95.6	95.3	95.1	95.0	

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV12 (G.W) 2.3M	BH-ENV5 (G.W) 2.73M			
				Client sampling date / time: [03-JUL-2013]	[03-JUL-2013]			
				HK1317598-005	HK1317598-006			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0	<2.0			
Acenaphthylene	208-96-8	2.0	µg/L	<2.0	<2.0			
Acenaphthene	83-32-9	2.0	µg/L	<2.0	<2.0			
Fluorene	86-73-7	2.0	µg/L	<2.0	<2.0			
Phenanthrene	85-01-8	2.0	µg/L	<2.0	<2.0			
Anthracene	120-12-7	2.0	µg/L	<2.0	<2.0			
Fluoranthene	206-44-0	2.0	µg/L	<2.0	<2.0			
Pyrene	129-00-0	2.0	µg/L	<2.0	<2.0			
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0			
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20	<20			
C9 - C16 Fraction	----	500	µg/L	<500	<500			
C17 - C35 Fraction	----	500	µg/L	<500	<500			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	**81.8**	**70.1**			
4-Terphenyl-d14	1718-51-0	0.1	%	**95.3**	**113**			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	**108**	**99.7**			
Toluene-D8	2037-26-5	0.1	%	**102**	**100**			
4-Bromofluorobenzene	460-00-4	0.1	%	**97.1**	**97.8**			

Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2953306)								
HK1317593-005	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.6	17.2	3.2
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2945371)								
HK1317305-001	Anonymous	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)								
HK1317593-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)								
HK1317593-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0

Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)								
HK1317305-011	Anonymous	**C6 - C8 Fraction**	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **SOIL**

Method: Compound	CAS Number	Method Blank (MB) Report: LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	DCS	Recovery Limits (%): Low	High	RPD (%): Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2945371)											
Naphthalene	91-20-3	25	µg/kg	----	25 µg/kg	90.0	----	63	117	----	----
				<50	----	----	----	----	----	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.8	----	54	119	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	82.6	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	84.8	----	60	126	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2945371) - Continued											
Phenanthrene	85-01-8	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.3	----	60	127	----	----
Anthracene	120-12-7	25	µg/kg	----	25 µg/kg	97.4	----	56	124	----	----
				<50	----	----	----	----	----	----	----
Fluoranthene	206-44-0	25	µg/kg	----	25 µg/kg	97.3	----	61	132	----	----
				<50	----	----	----	----	----	----	----
Pyrene	129-00-0	25	µg/kg	----	25 µg/kg	101	----	61	133	----	----
				<50	----	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	94.7	----	57	124	----	----
Chrysene	218-01-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	99.5	----	60	128	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	94.8	----	48	135	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.6	----	58	133	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	96.7	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	----	25 µg/kg	80.7	----	48	134	----	----
				<50	----	----	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	86.0	----	50	137	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	91.8	----	55	140	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	92.1	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	95.3	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	89.0	----	69	139	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	77.0	----	34	106	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	70.3	----	38	92	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	71.9	----	34	100	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	75.5	----	31	99	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	76.7	----	34	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	63.7	----	42	102	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	55	105	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	----	55	107	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	94.9	----	65	121	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2950617) - Continued											
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	95.4	----	52	102	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945385)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	90.0	----	76	1134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2945439)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	52.6	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	49.6	----	4	130	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950614)										
HK1317593-002	Anonymous	C9 - C16 Fraction	----	32 mg/kg	85.0	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	78.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2950620)										
HK1317593-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	97.9	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 7
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1318887
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Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 12-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025607			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accedited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

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General Comments
This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 17-JUL-2013
Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
Specific comments for Work Order: **HK1318887**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.
Sample(s) were received in a chilled condition.
Water sample(s) analysed and reported on an as received basis.
Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV3A 0.80M	BH-ENV8A 0.85M			
				Client sampling date / time: [12-JUL-2013]	[12-JUL-2013]			
				HK1318887-002	HK1318887-004			
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	21.2	18.8			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500			
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500			
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500			
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500			
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500			
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500			
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500			
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500			
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500			
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500			
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500			
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500			
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500			
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500			
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500			
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5			
C9 - C16 Fraction	----	200	mg/kg	<200	<200			
C17 - C35 Fraction	----	500	mg/kg	<500	<500			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	91.4	72.5			
4-Terphenyl-d14	1718-51-0	0.1	%	98.4	97.6			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	94.5	99.0			
Toluene-D8	2037-26-5	0.1	%	99.3	99.6			
4-Bromofluorobenzene	460-00-4	0.1	%	98.1	99.2			

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV3A (GW) 0.85M	BH-ENV8A (GW) 0.9M			
				Client sampling date / time: [12-JUL-2013]	[12-JUL-2013]			
				HK1318887-001	HK1318887-003			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0	<2.0			
Acenaphthylene	208-96-8	2.0	µg/L	<2.0	<2.0			
Acenaphthene	83-32-9	2.0	µg/L	<2.0	<2.0			
Fluorene	86-73-7	2.0	µg/L	<2.0	<2.0			
Phenanthrene	85-01-8	2.0	µg/L	<2.0	<2.0			
Anthracene	120-12-7	2.0	µg/L	<2.0	<2.0			
Fluoranthene	206-44-0	2.0	µg/L	<2.0	<2.0			
Pyrene	129-00-0	2.0	µg/L	<2.0	<2.0			
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0			
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20	<20			
C9 - C16 Fraction	----	500	µg/L	<500	<500			
C17 - C35 Fraction	----	500	µg/L	<500	<500			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	70.2	52.6			
4-Terphenyl-d14	1718-51-0	0.1	%	92.8	104			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	99.8	107			
Toluene-D8	2037-26-5	0.1	%	103	100			
4-Bromofluorobenzene	460-00-4	0.1	%	101	98.8			

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2966734)								
HK1318730-021	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.6	16.2	2.5
HK1318730-026	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.3	16.3	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2966697)								
HK1318970-001	Anonymous	Fluoranthene	206-44-0	150	µg/kg	333	317	4.9
		Pyrene	129-00-0	150	µg/kg	402	364	10.0
		Benz(a)anthracene	56-55-3	150	µg/kg	243	230	5.5
		Chrysene	218-01-9	150	µg/kg	234	228	2.7
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	485	495	2.1
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	228	204	10.7
		Benzo(a)pyrene	50-32-8	150	µg/kg	371	336	9.9
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	355	349	1.8
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	348	350	0.7
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	114	117	2.3
		Anthracene	120-12-7	50	µg/kg	55	56	2.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)								
HK1318887-002	BH-ENV3A 0.80M	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)								
HK1318887-002	BH-ENV3A 0.80M	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2968462)								
HK1318887-001	BH-ENV3A (GW) 0.85M	C6 - C8 Fraction	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2966697)											
Naphthalene	91-20-3	25	µg/kg	----	25 µg/kg	102	----	63	117	----	----
				<50	----	----	----	----	----	----	----
Acenaphthylene	208-96-8	25	µg/kg	----	25 µg/kg	91.0	----	54	119	----	----
				<50	----	----	----	----	----	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	95.1	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	50	µg/kg	<50	----	----	----	----	----	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2966697) - Continued											
Fluorene	86-73-7	25	µg/kg	----	25 µg/kg	92.4	----	60	126	----	----
Phenanthrene	85-01-8	25	µg/kg	----	25 µg/kg	97.7	----	60	127	----	----
				<50	----	----	----	----	----	----	----
Anthracene	120-12-7	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	91.4	----	56	124	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	99.1	----	61	132	----	----
Pyrene	129-00-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	101	----	61	133	----	----
Benz(a)anthracene	56-55-3	25	µg/kg	----	25 µg/kg	100	----	57	124	----	----
				<50	----	----	----	----	----	----	----
Chrysene	218-01-9	25	µg/kg	----	25 µg/kg	97.8	----	60	128	----	----
				<50	----	----	----	----	----	----	----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	----	25 µg/kg	101	----	48	135	----	----
				<50	----	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	108	----	58	133	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	94.8	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	----	25 µg/kg	99.3	----	48	134	----	----
				<50	----	----	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	97.6	----	50	137	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	89.8	----	55	140	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	96.5	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	89.0	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	89.9	----	69	139	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2966724)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	70.9	----	34	106	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	82.8	----	38	92	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	81.4	----	34	100	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	70.7	----	31	99	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	75.7	----	34	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	79.4	----	42	102	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	94.3	----	55	105	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	96.7	----	55	107	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2966724) - Continued											
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	98.3	----	65	121	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	97.4	----	52	102	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966725)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	49.4	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	50.9	----	4	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2968462)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	85.9	----	76	1134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	MSD	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)										
HK1318887-004	BH-ENV8A 0.85M	C9 - C16 Fraction	----	32 mg/kg	73.7	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	74.2	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)										
HK1318887-004	BH-ENV8A 0.85M	C6 - C8 Fraction	----	4.5 mg/kg	91.1	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 6
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1318896
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 12-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 22-AUG-2013
C-O-C number	: H025606			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 19-AUG-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1318896**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.

Sample(s) were received in a chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV10 3.0M; Client sampling date / time: [11-JUL-2013]; HK1318896-001	BH-ENV06 0.73M; [11-JUL-2013]; HK1318896-002	BH-ENV01 0.83M; [11-JUL-2013]; HK1318896-003	BH-ENV3A 0.5M; [11-JUL-2013]; HK1318896-004	BH-ENV8A 0.5M; [11-JUL-2013]; HK1318896-005
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	18.5	17.9	16.3	15.5	16.1
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500	<500
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	107	87.0	84.6	88.9	84.0
4-Terphenyl-d14	1718-51-0	0.1	%	110	96.6	96.2	98.1	89.4
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	93.5	95.6	92.5	96.4	98.8
Toluene-D8	2037-26-5	0.1	%	97.6	98.8	98.6	98.3	99.4
4-Bromofluorobenzene	460-00-4	0.1	%	101	96.8	97.7	96.6	98.6

Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2966734)								
HK1318730-021	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.6	16.2	2.5
HK1318730-026	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.3	16.3	0.0
EA/ED: Physical and Aggregate Properties (QC Lot: 3018791)								
HK1318896-001	BH-ENV10 3.0M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	18.5	18.2	1.8
HK1322092-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	9.6	9.5	1.1
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2966697)								
HK1318970-001	Anonymous	Fluoranthene	206-44-0	150	µg/kg	333	317	4.9
		Pyrene	129-00-0	150	µg/kg	402	364	10.0
		Benz(a)anthracene	56-55-3	150	µg/kg	243	230	5.5
		Chrysene	218-01-9	150	µg/kg	234	228	2.7
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	485	495	2.1
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	228	204	10.7
		Benzo(a)pyrene	50-32-8	150	µg/kg	371	336	9.9
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	355	349	1.8
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	348	350	0.7
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	114	117	2.3
		Anthracene	120-12-7	50	µg/kg	55	56	2.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3013444)								
HK1318896-001	BH-ENV10 3.0M	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)								
HK1318887-002	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)								
HK1318887-002	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004350)								
HK1321360-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004354)								
HK1321360-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2966697)											
Naphthalene	91-20-3	25	µg/kg	---- <50	25 µg/kg ----	102 ----	---- ----	63 ----	117 ----	---- ----	---- ----
Acenaphthylene	208-96-8	25	µg/kg	---- <50	25 µg/kg ----	91.0 ----	---- ----	54 ----	119 ----	---- ----	---- ----
Acenaphthene	83-32-9	25	µg/kg	---- <50	25 µg/kg ----	95.1 ----	---- ----	59 ----	122 ----	---- ----	---- ----
Fluorene	86-73-7	50	µg/kg	<50 ----	---- 25 µg/kg	---- 92.4	---- ----	---- 60	---- 126	---- ----	---- ----
Phenanthrene	85-01-8	25	µg/kg	---- <50	25 µg/kg ----	97.7 ----	---- ----	60 ----	127 ----	---- ----	---- ----
Anthracene	120-12-7	50	µg/kg	<50 ----	---- 25 µg/kg	---- 91.4	---- ----	---- 56	---- 124	---- ----	---- ----
Fluoranthene	206-44-0	50	µg/kg	<50 ----	---- 25 µg/kg	---- 99.1	---- ----	---- 61	---- 132	---- ----	---- ----
Pyrene	129-00-0	50	µg/kg	<50 ----	---- 25 µg/kg	---- 101	---- ----	---- 61	---- 133	---- ----	---- ----
Benz(a)anthracene	56-55-3	25	µg/kg	---- <50	25 µg/kg ----	100 ----	---- ----	57 ----	124 ----	---- ----	---- ----
Chrysene	218-01-9	25	µg/kg	---- <50	25 µg/kg ----	97.8 ----	---- ----	60 ----	128 ----	---- ----	---- ----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	---- <50	25 µg/kg ----	101 ----	---- ----	48 ----	135 ----	---- ----	---- ----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50 ----	---- 25 µg/kg	---- 108	---- ----	---- 58	---- 133	---- ----	---- ----
Benzo(a)pyrene	50-32-8	25	µg/kg	---- <50	25 µg/kg ----	94.8 ----	---- ----	50 ----	124 ----	---- ----	---- ----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	---- <50	25 µg/kg ----	99.3 ----	---- ----	48 ----	134 ----	---- ----	---- ----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50 ----	---- 25 µg/kg	---- 97.6	---- ----	---- 50	---- 137	---- ----	---- ----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50 ----	---- 25 µg/kg	---- 89.8	---- ----	---- 55	---- 140	---- ----	---- ----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3013444)											
Naphthalene	91-20-3	50	µg/kg	<50 ----	---- 25 µg/kg	---- 102	---- ----	---- 63	---- 117	---- ----	---- ----
Acenaphthylene	208-96-8	25	µg/kg	---- <50	25 µg/kg ----	101 ----	---- ----	54 ----	119 ----	---- ----	---- ----
Acenaphthene	83-32-9	50	µg/kg	<50 ----	---- 25 µg/kg	---- 100	---- ----	---- 59	---- 122	---- ----	---- ----
Fluorene	86-73-7	25	µg/kg	---- <50	25 µg/kg ----	103 ----	---- ----	60 ----	126 ----	---- ----	---- ----
Phenanthrene	85-01-8	50	µg/kg	<50 ----	---- 25 µg/kg	---- 102	---- ----	---- 60	---- 127	---- ----	---- ----
Anthracene	120-12-7	25	µg/kg	---- <50	25 µg/kg ----	99.4 ----	---- ----	56 ----	124 ----	---- ----	---- ----
Fluoranthene	206-44-0	50	µg/kg	<50 ----	---- 25 µg/kg	---- 101	---- ----	---- 61	---- 132	---- ----	---- ----
Pyrene	129-00-0	25	µg/kg	---- <50	25 µg/kg ----	101 ----	---- ----	61 ----	133 ----	---- ----	---- ----
Benz(a)anthracene	56-55-3	25	µg/kg	---- <50	25 µg/kg ----	97.3 ----	---- ----	57 ----	124 ----	---- ----	---- ----
Chrysene	218-01-9	50	µg/kg	<50 ----	---- 25 µg/kg	---- 99.5	---- ----	---- 60	---- 128	---- ----	---- ----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	---- <50	25 µg/kg ----	99.3 ----	---- ----	48 ----	135 ----	---- ----	---- ----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	---- <50	25 µg/kg ----	100 ----	---- ----	58 ----	133 ----	---- ----	---- ----
Benzo(a)pyrene	50-32-8	25	µg/kg	---- <50	25 µg/kg ----	101 ----	---- ----	50 ----	124 ----	---- ----	---- ----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50 ----	---- 25 µg/kg	---- 92.2	---- ----	---- 48	---- 134	---- ----	---- ----
Dibenz(a.h)anthracene	53-70-3	25	µg/kg	---- <50	25 µg/kg ----	92.9 ----	---- ----	50 ----	137 ----	---- ----	---- ----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50 ----	---- 25 µg/kg	---- 96.2	---- ----	---- 55	---- 140	---- ----	---- ----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	96.5	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	89.0	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	89.9	----	69	139	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004350)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	93.2	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	67.7	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004354)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	85.5	----	69	139	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966700)										
HK1318887-004	Anonymous	C9 - C16 Fraction	----	32 mg/kg	73.7	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	74.2	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966727)										
HK1318887-004	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	91.1	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004350)										
HK1321360-002	Anonymous	C9 - C16 Fraction	----	32 mg/kg	69.7	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	71.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 3004354)										
HK1321360-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	80.8	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 7
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1320318
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 29-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025609			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accedited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Ng Chun Hoi, Michael	Chemist - Inorganics	Inorganics

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General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 02-AUG-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1320318**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.

Sample(s) were received in a chilled condition.

Water sample(s) analysed and reported on an as received basis.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV4A 0.5M Client sampling date / time: [29-JUL-2013] HK1320318-001	BH-ENV4A 1.0M [29-JUL-2013] HK1320318-002	BH-ENV4A 1.8M [29-JUL-2013] HK1320318-003		
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	16.1	15.9	10.0		
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500		
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5		
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200		
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	93.6	99.9	100		
4-Terphenyl-d14	1718-51-0	0.1	%	89.3	91.2	89.6		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							Surrogate control limits listed at end of this report.	
Dibromofluoromethane	1868-53-7	0.1	%	97.1	97.2	98.6		
Toluene-D8	2037-26-5	0.1	%	102	101	102		
4-Bromofluorobenzene	460-00-4	0.1	%	91.3	92.5	91.4		

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV4A 1.85M (G.W)				
				Client sampling date / time: [29-JUL-2013]				
				HK1320318-004				
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				
C17 - C35 Fraction	----	500	µg/L	<500				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	**77.4**				
4-Terphenyl-d14	1718-51-0	0.1	%	**87.0**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	**102**				
Toluene-D8	2037-26-5	0.1	%	**102**				
4-Bromofluorobenzene	460-00-4	0.1	%	**94.0**				

Laboratory Duplicate (DUP) Report

Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2989534)								
HK1320290-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	10.7	10.2	4.8
HK1320290-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	10.4	10.8	3.8
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2987270)								
HK1320132-001	Anonymous	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979725)								
HK1319666-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979732)								
HK1319666-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0

Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979735)								
HK1319666-003	Anonymous	**C6 - C8 Fraction**	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: **SOIL**

Method: Compound	CAS Number	Method Blank (MB) Report: LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%): LCS	DCS	Recovery Limits (%): Low	High	RPD (%): Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2987270)											
Naphthalene	91-20-3	25	µg/kg	----	25 µg/kg	99.4	----	63	117	----	----
				<50	----	----	----	----	----	----	----
Acenaphthylene	208-96-8	25	µg/kg	----	25 µg/kg	100	----	54	119	----	----
				<50	----	----	----	----	----	----	----
Acenaphthene	83-32-9	25	µg/kg	----	25 µg/kg	93.0	----	59	122	----	----
				<50	----	----	----	----	----	----	----
Fluorene	86-73-7	50	µg/kg	<50	----	----	----	----	----	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 2987270) - Continued											
Fluorene	86-73-7	25	µg/kg	----	25 µg/kg	102	----	60	126	----	----
Phenanthrene	85-01-8	25	µg/kg	----	25 µg/kg	95.8	----	60	127	----	----
				<50	----	----	----	----	----	----	----
Anthracene	120-12-7	25	µg/kg	----	25 µg/kg	90.1	----	56	124	----	----
				<50	----	----	----	----	----	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	99.2	----	61	132	----	----
Pyrene	129-00-0	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	101	----	61	133	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	93.7	----	57	124	----	----
Chrysene	218-01-9	25	µg/kg	----	25 µg/kg	99.8	----	60	128	----	----
				<50	----	----	----	----	----	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	96.2	----	48	135	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	96.1	----	58	133	----	----
Benzo(a)pyrene	50-32-8	25	µg/kg	----	25 µg/kg	96.7	----	50	124	----	----
				<50	----	----	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	25	µg/kg	----	25 µg/kg	85.9	----	48	134	----	----
				<50	----	----	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	----	----	----	----	----	----	----
				----	25 µg/kg	94.2	----	50	137	----	----
Benzo(g.h.i)perylene	191-24-2	25	µg/kg	----	25 µg/kg	94.8	----	55	140	----	----
				<50	----	----	----	----	----	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979725)											
C9 - C16 Fraction	----	200	mg/kg	<200	32 mg/kg	63.1	----	53	104	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	90 mg/kg	53.9	----	43	99	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979732)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	89.1	----	69	139	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2989863)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	96.1	----	54	110	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	97.3	----	54	103	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	89.6	----	56	102	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	97.3	----	50	105	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	96.8	----	53	106	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	93.2	----	54	107	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	99.1	----	63	118	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	101	----	67	120	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2989863) - Continued											
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	95.7	----	61	123	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	95.6	----	55	112	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979735)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	79.1	----	76	1134	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2989864)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	46.3	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	40.3	----	4	130	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979725)										
HK1319666-002	Anonymous	C9 - C16 Fraction	----	32 mg/kg	65.9	----	50	130	----	----
		C17 - C35 Fraction	----	90 mg/kg	60.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2979732)										
HK1319666-002	Anonymous	C6 - C8 Fraction	----	4.5 mg/kg	94.0	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 3
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1319351
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Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: RELOCATION OF SHA TIN SEWERAGE TREATMENT WORKS TO CAVERNS	Quote number	: ----	Date Samples Received	: 17-JUL-2013
Order number	: GE/2012/24.11			Issue Date	: 15-AUG-2013
C-O-C number	: H025608			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 18-JUL-2013

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1319351**

Project Name: Agreement No. CE 43/2011 (DS) Relocation of Sha Tin Sewerage Treatment Works to Caverns - Feasibility Study.

Sample(s) were received in a chilled condition.

Water sample(s) analysed and reported on an as received basis.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	Position	Authorised results for
Anh Ngoc Huynh	Senior Chemist - Organics	Organics

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BH-ENV10 (GW) 2.2M				
				Client sampling date / time: [17-JUL-2013]				
				HK1319351-001				
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				
C17 - C35 Fraction	----	500	µg/L	<500				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	321-60-8	0.1	%	50.5				
4-Terphenyl-d14	1718-51-0	0.1	%	96.2				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								Surrogate control limits listed at end of this report.
Dibromofluoromethane	1868-53-7	0.1	%	102				
Toluene-D8	2037-26-5	0.1	%	101				
4-Bromofluorobenzene	460-00-4	0.1	%	97.8				

Laboratory Duplicate (DUP) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2968462)								
HK1318887-001	Anonymous	C6 - C8 Fraction	----	0.02	mg/L	<0.02	<0.02	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 2972735)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	81.6	----	34	106	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	85.9	----	38	92	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	34	100	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	81.6	----	31	99	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	84.6	----	34	98	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	83.5	----	42	102	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	102	----	55	105	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	102	----	55	107	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	83.3	----	65	121	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	80.0	----	52	102	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2966725)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	49.4	----	12	112	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.60 mg/L	50.9	----	4	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 2968462)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	85.9	----	76	1134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Section 3

Summary of Sample Receipt Condition, Analysis Date and Method Reference

Summary of Sample Receipt Condition, Analysis Date and Method Reference

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

ALS Lab ID	Client Sample ID	Sampling Date	Sampling Time	Receipt Details			Storage Condition*	Testing Date		
				Date	Time	Condition		TPHs	VOCs	PAHs
HK1317305002	BH-ENV05/ 0.5M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305003	BH-ENV06/ 0.5M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305004	BH-ENV07/ 0.5M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305005	BH-ENV09/ 0.5M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305006	BH-ENV10/ 0.5M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305008	BH-ENV05/ 1.0M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305009	BH-ENV07/ 1.0M	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	--	4/07/2013
HK1317305011	TRIP BLANK	27/06/2013	0:00	27/06/2013	18:00	Ambient	4°C	2/07/2013	2/07/2013	2/07/2013
HK1317464001	BH-ENV10/ 1.0M	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464002	BH-ENV02/ 0.5M	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464003	BH-ENV02/ 1.0M	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464004	BH-ENV09/ 0.9M	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464005	BH-ENV07/ 1.5M	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464006	BH-ENV07/ 1.5M(A)	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464007	BH-ENV07/ 1.5M(B)	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317464008	EQUIPMENT BLANK	28/06/2013	0:00	28/06/2013	16:15	Ambient	4°C	5/07/2013	--	5/07/2013
HK1317593001	BH-ENV12/ 0.5M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593002	BH-ENV11/ 0.5M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593003	BH-ENV13/ 0.5M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593004	BH-ENV01/ 0.5M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593005	BH-ENV12/ 1.0M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593006	BH-ENV11/ 1.0M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593007	BH-ENV13/ 1.0M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317593008	BH-ENV07 (G.W) 1.6M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	5/07/2013
HK1317593009	BH-ENV09 (G.W) 1.0M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	5/07/2013
HK1317593010	BH-ENV02 (G.W) 1.15M	2/07/2013	0:00	2/07/2013	16:45	Ambient	4°C	5/07/2013	--	5/07/2013

***Container for sample storage:** 250mL Glass Jar with Teflon Lined Lid (for Chemical Testing) & High Density Polyethylene Bags (for Biological Testing)

Summary of Sample Receipt Condition, Analysis Date and Method Reference

Date of Issue: 23/08/2013
Client: Civil Engineering and Development Department
Service Order No.: GE/2012/24.11
Project: Agreement No. CE43/2011 (DS) Relocation of Sha Tin Sewage Treatment Works to Caverns - Feasibility Study
Provision of Chemical and Biological Testing Service

ALS Lab ID	Client Sample ID	Sampling Date	Sampling Time	Receipt Details			Storage Condition*	Testing Date		
				Date	Time	Condition		TPHs	VOCs	PAHs
HK1317598001	BH-ENV11/ 3.0M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317598002	BH-ENV12/ 2.2M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317598003	BH-ENV5/ 2.5M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317598004	BH-ENV2/ 1.1M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	8/07/2013
HK1317598005	BH-ENV12 (G.W) 2.3M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	5/07/2013
HK1317598006	BH-ENV5 (G.W) 2.73M	3/07/2013	0:00	3/07/2013	16:30	Ambient	4°C	5/07/2013	--	5/07/2013
HK1318887001	BH-ENV3A (GW) 0.85M	12/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	16/07/2013
HK1318887002	BH-ENV3A 0.80M	12/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1318887003	BH-ENV8A (GW) 0.9M	12/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	16/07/2013
HK1318887004	BH-ENV8A 0.85M	12/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1318896001	BH-ENV10 3.0M	11/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	15/08/2013	--	16/08/2013
HK1318896002	BH-ENV06 0.73M	11/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1318896003	BH-ENV01 0.83M	11/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1318896004	BH-ENV3A 0.5M	11/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1318896005	BH-ENV8A 0.5M	11/07/2013	0:00	12/07/2013	16:00	Ambient	4°C	16/07/2013	--	17/07/2013
HK1319351001	BH-ENV10 (GW) 2.2M	17/07/2013	0:00	17/07/2013	12:15	Ambient	4°C	18/07/2013	--	18/07/2013
HK1320318001	BH-ENV4A 0.5M	29/07/2013	0:00	29/07/2013	15:15	Ambient	4°C	30/07/2013	--	2/08/2013
HK1320318002	BH-ENV4A 1.0M	29/07/2013	0:00	29/07/2013	15:15	Ambient	4°C	30/07/2013	--	2/08/2013
HK1320318003	BH-ENV4A 1.8M	29/07/2013	0:00	29/07/2013	15:15	Ambient	4°C	30/07/2013	--	2/08/2013
HK1320318004	BH-ENV4A 1.85M (G.W)	29/07/2013	0:00	29/07/2013	15:15	Ambient	4°C	30/07/2013	--	1/08/2013

***Container for sample storage:** 250mL Glass Jar with Teflon Lined Lid (for Chemical Testing) & High Density Polyethylene Bags (for Biological Testing)

Section 4

Chain of Custody (COC) Form

CHAIN OF CUSTODY DOCUMENTATION

H 025602

Revised for 27/6

ALS Laboratory Group

CLIENT: CEDD GE2013/24.11	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): Mr. Sun Ng	PHONE
PROJECT ID: S 24.11 Relocation of STSTWTC	EMAIL REPORT TO: keali@drilltech.com.hk
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		SVOC	PCR	C6-C8 Fraction	BTEX
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles				
1	BH-ENV04/0.5m	S	27/6		250ml	1	✓	✓		
2	BH-ENV05/0.5m	〃	〃		〃	1	✓	✓		
3	BH-ENV06/0.5m	〃	〃		〃	1	✓	✓		
4	BH-ENV07/0.5m	〃	〃		〃	1	✓	✓		
5	BH-ENV09/0.5m	〃	〃		〃	1	✓	✓		
6	BH-ENV10/0.5m	〃	〃		〃	1	✓	✓		
7	BH-ENV04/1.0m	〃	〃		〃	1	✓	✓		
8	BH-ENV05/1.0m	〃	〃		〃	1	✓	✓		
9	BH-ENV07/1.0m	〃	〃		〃	1	✓	✓		
10	Field Blank	L	〃		1L	1	✓	✓		
11	Trip Blank	L	〃		~~1L~~ 40ml	1			✓	✓

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Chiu Chung Keung	Date: 27/6/2013	Name: Leo Leung ALS	Date: 27/6/13	Con' Note No:
Of:	Time:	Of:	Time: 1800	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 025603

ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr Sun Ng.
PROJECT ID: S 24.11 Relocation of STSTWTC
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	SVOC	PCB
1	BH-ENV10/1.0m	S	28/6		250ml	1	✓	✓
2	BH-ENV02/0.5m	〃	〃		〃	1	✓	✓
3	BH-ENV02/1.0m	〃	〃		〃	1	✓	✓
4	BH-ENV09/0.9m	〃	〃		〃	1	✓	✓
5	BH-ENV07/1.5m	〃	〃		〃	1	✓	✓
6	BH-ENV07/1.5m (A)	〃	〃		〃	1	✓	✓
7	BH-ENV07/1.5m (B)	〃	〃		〃	1	✓	✓
8	Equipment Blank	〃	〃		1L	1	✓	✓

RELINQUISHED BY:
Name: Chan Chung Keung
Of:
Date: 28/06/2013
Time:
Name:
Of:
Date:
Time:

RECEIVED BY
Name: Wan Wai
Of: ALS
Date: 28/6/13
Time: 1615
Name:
Of:
Date:
Time:

METHOD OF SHIPMENT
Con' Note No:
Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 025604

ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr Sun Ng.
PROJECT ID: S 24.11 Relocation of STSTWTC
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	SVOC	PCB
1	BH-ENV12/0.5m	S	2/7		250ml	1	✓	✓
2	BH-ENV11/0.5m	〃	〃		〃	1	✓	✓
3	BH-ENV13/0.5m	〃	〃		〃	1	✓	✓
4	BH-ENV01/0.5m	〃	〃		〃	1	✓	✓
5	BH-ENV12/1.0m	〃	〃		〃	1	✓	✓
6	BH-ENV11/1.0m)	〃	〃		〃	1	✓	✓
7	BH-ENV13(1.0m)	〃	〃		〃	1	✓	✓
8	(1.6m) BH-ENV07(GW)	Water	〃		1L	1	✓	✓
9	(1.0m) BH-ENV09(GW)	〃	〃		〃	1	✓	✓
10	(1.5m) BH-ENV02(GW)	〃	〃		〃	1	✓	✓

RELINQUISHED BY:
Name: Chow Sik Ming
Of:
Date: 2-7-2013
Time:
Name:
Of:
Date:
Time:

RECEIVED BY
Name:
Of: ALS
Date: 2-7-2013
Time: 16:45
Name:
Of:
Date:
Time:

METHOD OF SHIPMENT
Con' Note No:
Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 025605

ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr. Sun Ng
PROJECT ID: S24.11 Relocation of STSTWTC
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION Type / Code	Total bottles	SVOC	PCR
1	BH-ENV11/3.0m	S	3/7		250ml	1	✓	✓
2	BH-ENV12/2.2m	〃	〃		〃	1	✓	✓
3	BH-ENV5/2.5m	〃	〃		〃	1	✓	✓
4	BH-ENV2/1.1m	〃	〃		〃	1	✓	✓
5	BH-ENV12/2.3m(GW)	Water	〃		1L	1	✓	✓
6	BH-ENV5/2.73m(GW)	〃	〃		〃	1	✓	✓

RELINQUISHED BY:

Name: Chow Sik Ming	Date: 3-7-2013	Name: Wong ALS	Date: 3/7/2013
Of:	Time:	Of:	Time: 1630
Name:	Date:	Name:	Date:
Of:	Time:	Of:	Time:

RECEIVED BY

METHOD OF SHIPMENT
Con' Note No:
Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 025607

ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr. Sun Ng
PROJECT ID: S24.11 Relocation of STSTWTC
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION Type / Code	Total bottles	SVOC	PCR
1	BH-ENV3A/0.85m(GW)	Water	12/7		1L	1	✓	✓
2	BH-ENV3A/0.80m	S	〃		250ml	1	✓	✓
3	BH-ENV8A/0.9m(GW)	Water	〃		1L	1	✓	✓
4	BH-ENV8A/0.85m	S	〃		250ml	1	✓	✓

RELINQUISHED BY:

Name: Chan Chung Keung	Date: 12/07/2013	Name:	Date: 12/7/13
Of: Driltech Ground Engg. (HK) Ltd	Time:	Of: ALS	Time: 16:00
Name:	Date:	Name:	Date:
Of:	Time:	Of:	Time:

RECEIVED BY

METHOD OF SHIPMENT
Con' Note No:
Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

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ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr. Sun Ng
PROJECT ID: S24.11 Relocation of ST STWTC
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		SVOC	PCB										
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
1	BH-ENV10/13.0m	S	11/7		250 ml	1	✓	✓										0h hold.
2	BH-ENV06/0.73m	"	"		"	1	✓	✓										
3	BH-ENV01/0.83m	"	"		"	1	✓	✓										
4	BH-ENV3A/0.5m	"	"		"	1	✓	✓										
5	BH-ENV8A/0.5m	"	"		"	1	✓	✓										
	~~BH-ENV~~																	

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Chan Chung Keung Chris	Date: 11/07/2013	Name: Ketsu	Date: 12-7-2013	Con' Note No:
Of: Drill Tech Ground Engg. Ltd	Time:	Of: ALS Hk	Time: 16:00	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

CLIENT: CEDD GE 2013/24.11
ADDRESS / OFFICE:
PROJECT MANAGER (PM): Mr Sun Ng
PROJECT ID: S24.11 Relocation of ST STWTL
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:
RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER:
MOBILE:
PHONE
EMAIL REPORT TO: kenli@driltech.com.hk
EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		SVOC	PCB										
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
1	BH-ENV10/22m(GW)	Water	17/7		1L	2	✓	✓										

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Chow Sik Ming	Date: 17-7-2013	Name: Ketsu	Date: 17-7-2013	Con' Note No:
Of:	Time:	Of: ALS Hk	Time: 12:15	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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H 025609

ALS Laboratory Group

CLIENT: EDD GE 2013/24.11	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): Mr Sun NG	PHONE
PROJECT ID: S24.11 Relocation of STSTWTL	EMAIL REPORT TO: ~~Kenli@dritech.com.hk~~ kenli@dritech.com.hk
SITE: Sha Tin Sewage Treatment Plant P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		SVOC	PCR										
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles												
	BH-ENV4A/0.5m	S	29/7		250ml	1	✓	✓										
	BH-ENV4A/1.0m	"	"		"	1	✓	✓										
	BH-ENV4A/1.8m	"	"		"	1	✓	✓										
	BH-ENV4A/1.8m(G.W)	Water	"		1L	2	✓	✓										

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: Chow Sik Ming	Date: 29-7-2013		Name:	Date: 29-7-13		Con' Note No:
Of:	Time:		Of: ALS	Time: 15:15		
Name:	Date:		Name:	Date:		Transport Co:
Of:	Time:		Of:	Time:		

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CAP Appendix 2.02

Selected Aerial Photos Reviewed

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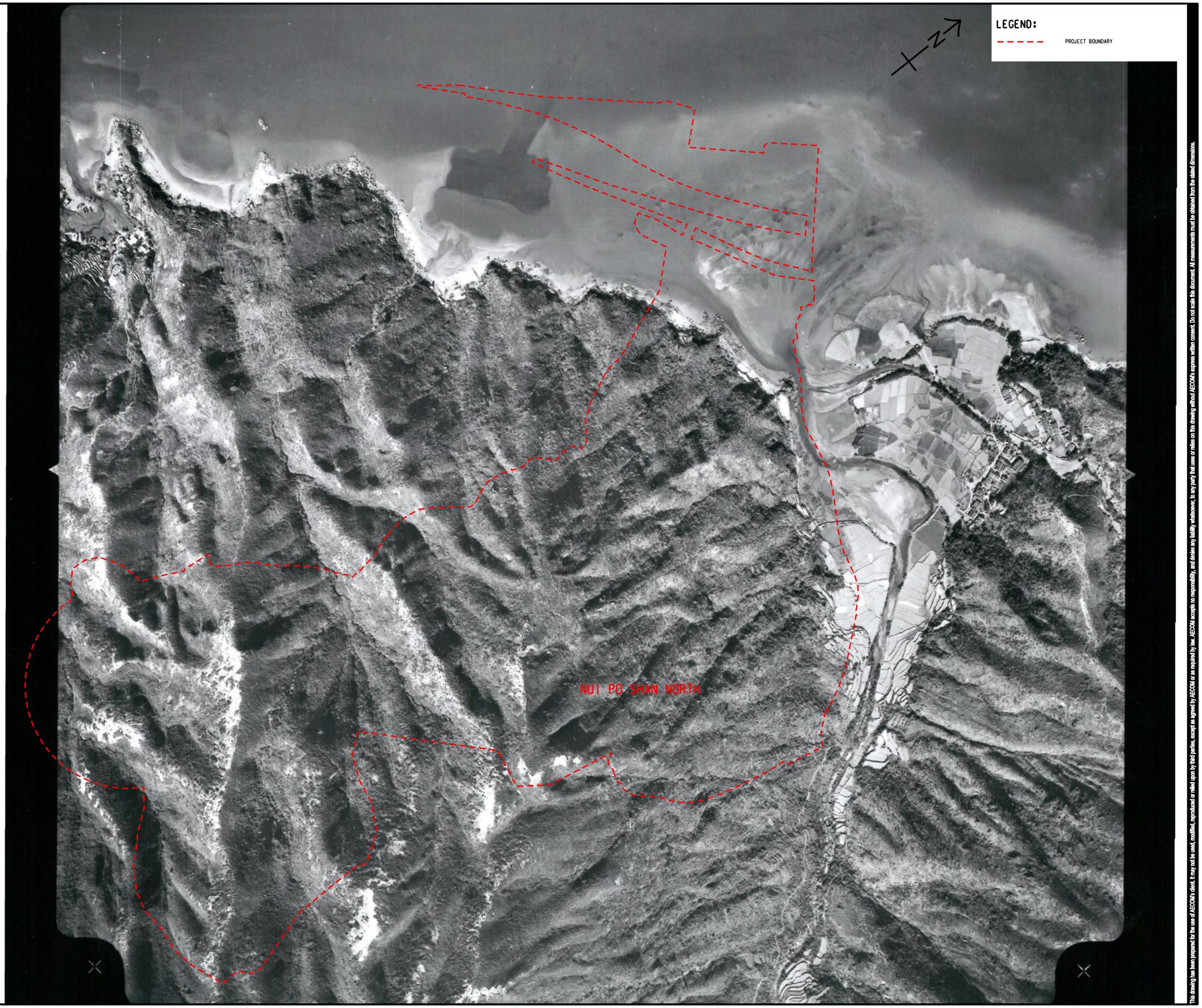

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/19
PATH: P:\Projects\60334056\DRAWING\REPORTS\EIA\EIA_CAP_701.dgn

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PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

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Drainage Services Department

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A	JAN. 16	EIA	
-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE
比例

A1 1 : 2500

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60334056

CONTRACT NO.
合約編號

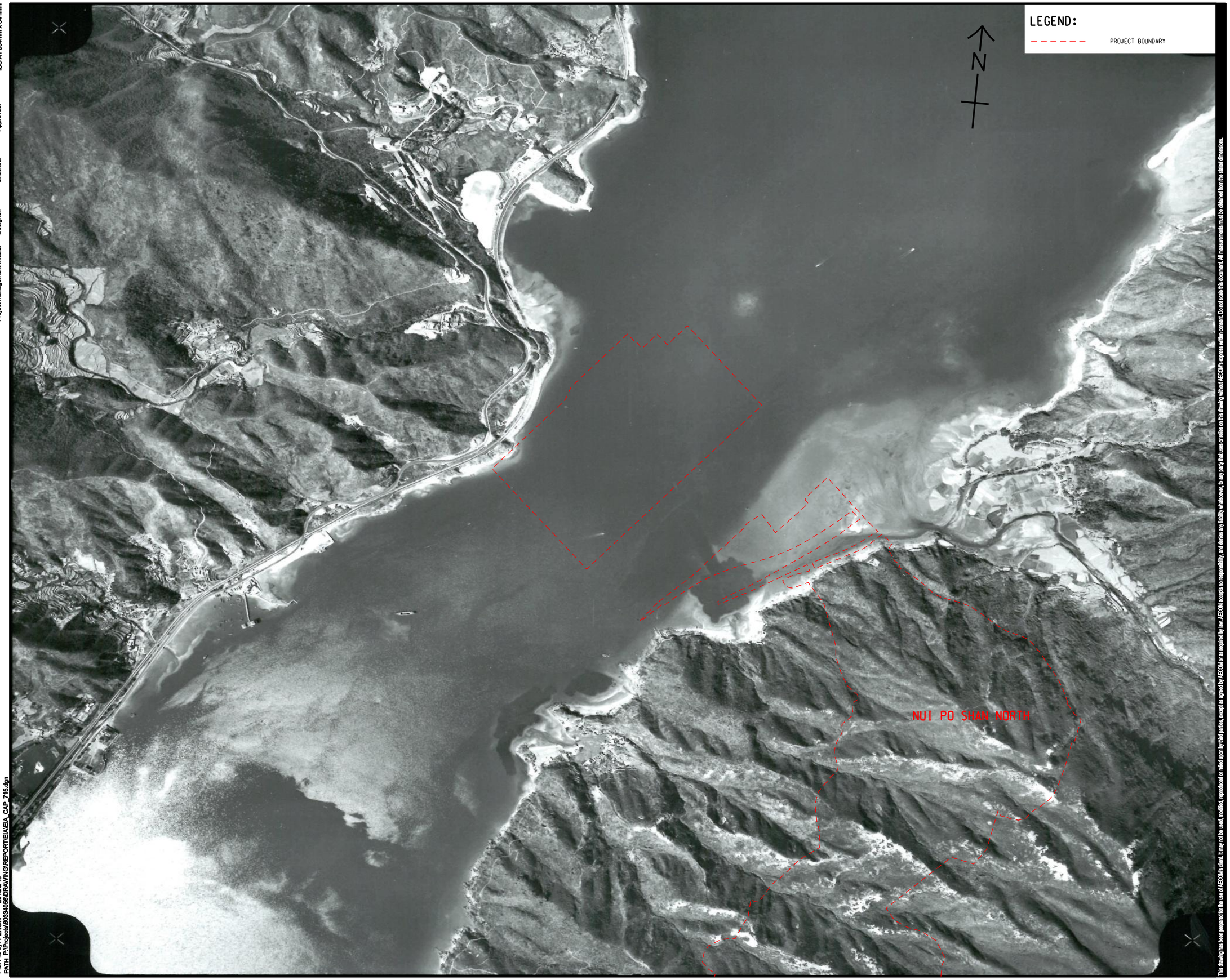
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1963)

SHEET NUMBER
圖紙編號

60334056/CAP/1963A



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Plot File by: PENGW 2016/3/19
PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_715.dgn

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PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
狀態

SCALE 比例: N.T.S.

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號: 60334056

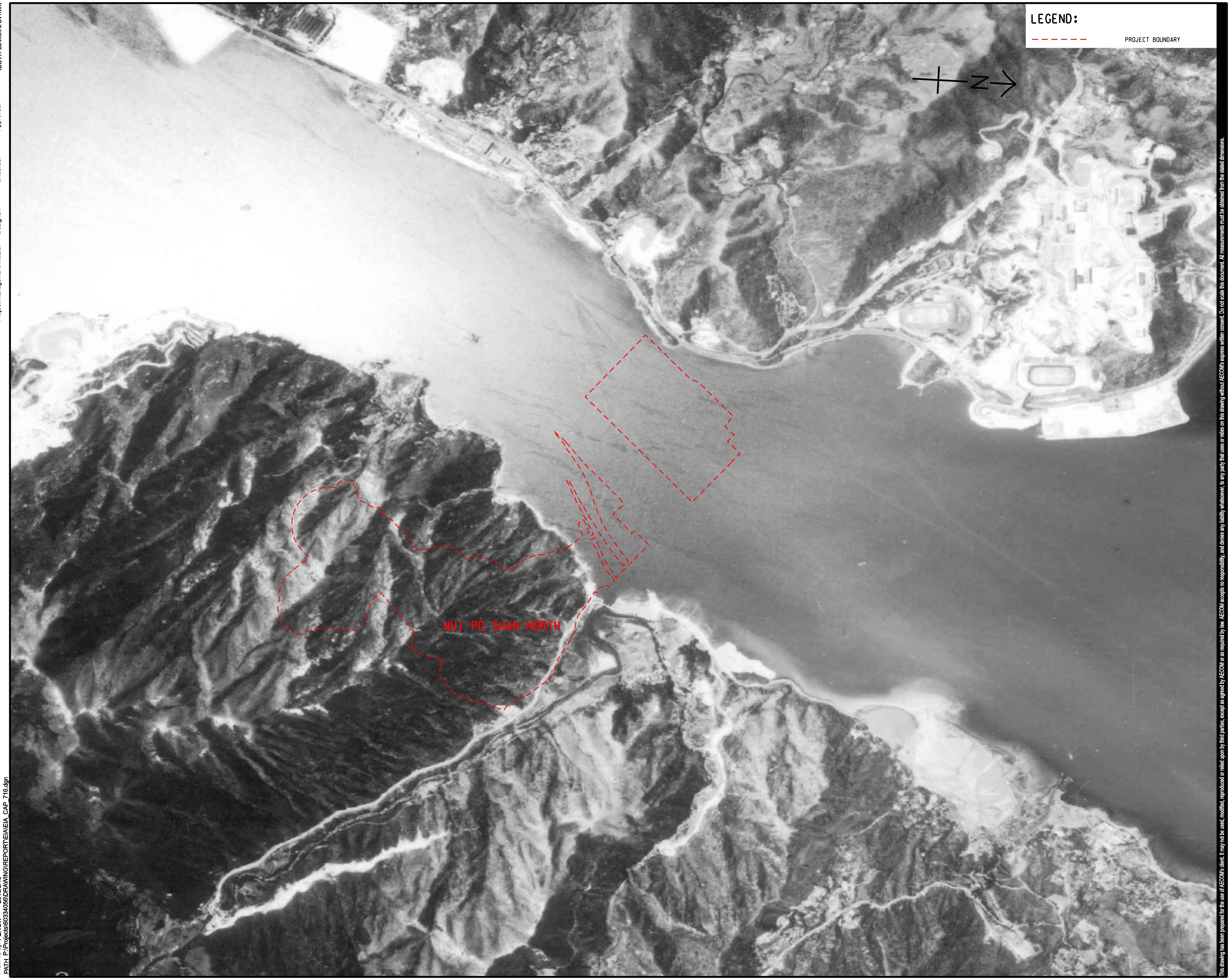
CONTRACT NO. 合約編號: CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1963) (2)

SHEET NUMBER
圖紙編號

60334056/CAP/1963(2)A



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PROJECT

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT

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Drainage Services Department

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STATUS

SCALE: N.T.S.

DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60334056

CONTRACT NO.: CE 30/2014 (DS)

SHEET TITLE

AERIAL PHOTOGRAPH (1974)

SHEET NUMBER

60334056/CAP/1974A

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/19

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/19
PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_717.dgn

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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
狀況

SCALE 比例
N.T.S.

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1979)

SHEET NUMBER
圖紙編號

60334056/CAP/1979A

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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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A	JAN. 16	EIA	
-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE
比例

A1 1 : 2500

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60334056

CONTRACT NO.
合約編號

CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1981)

SHEET NUMBER
圖紙編號

60334056/CAP/1981A

Plot File by: PENGW 2016/3/19
PATH P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_702.dgn

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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A	JAN. 16	EIA	
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STATUS
階段

SCALE 比例
A1 1 : 5000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1982)

SHEET NUMBER
圖紙編號

60334056/CAP/1982A

Plot File by: PENGW 2016/3/19
PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_703.dgn

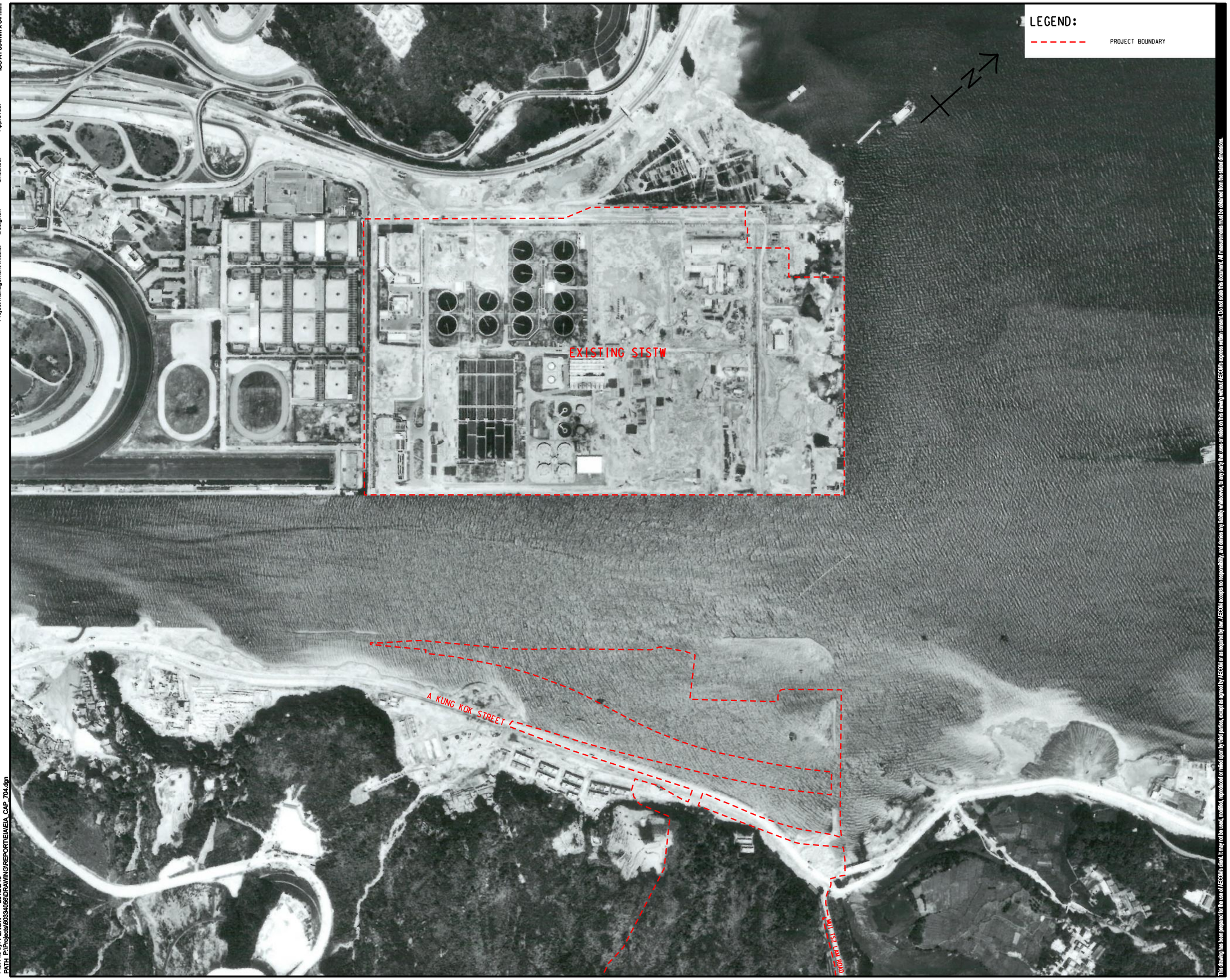
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
階段

SCALE 比例
A1 1 : 2500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1983)

SHEET NUMBER
圖紙編號

60334056/CAP/1983A

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Plot File by: PENGW 2016/3/19
PATH P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_705.dgn

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PROJECT
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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
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-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE 比例
A1 1 : 2500

DIMENSION UNIT 尺寸單位
METRES

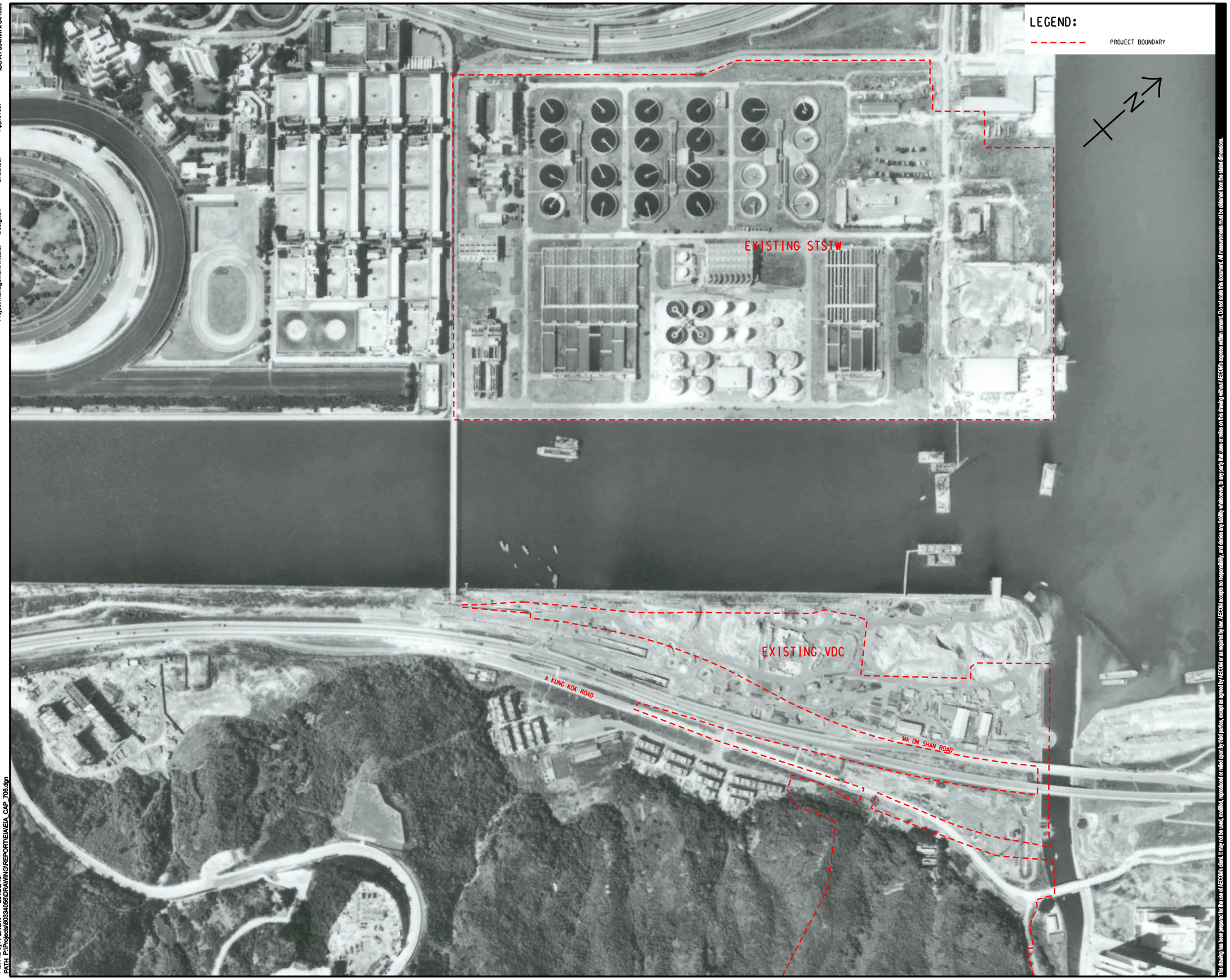
KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE 圖紙名稱
AERIAL PHOTOGRAPH (1985)

SHEET NUMBER 圖紙編號
60334056/CAP/1985A



ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/19
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PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
階段

SCALE 比例
A1 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

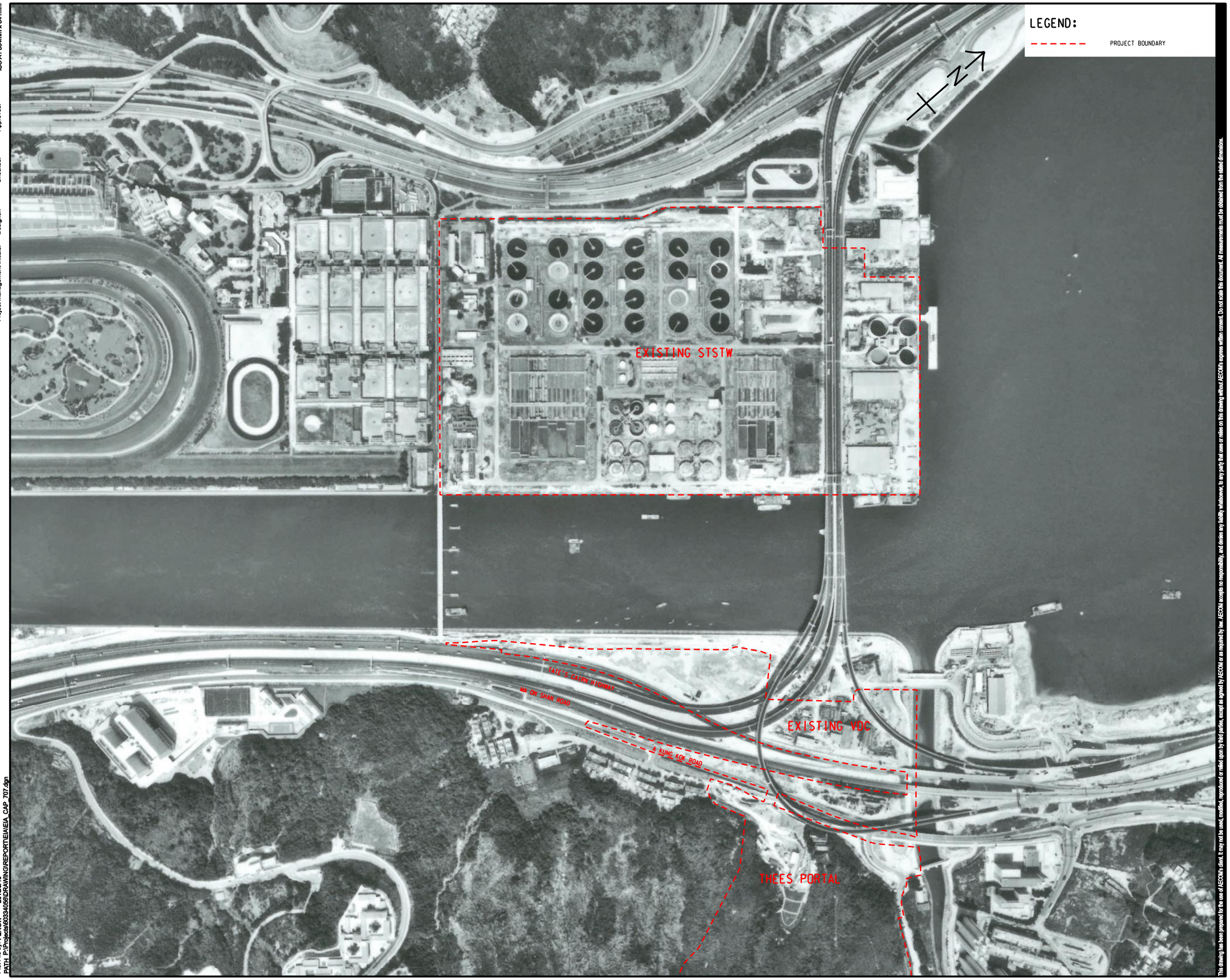
CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1989)

SHEET NUMBER
圖紙編號

60334056/CAP/1989A



ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/19
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PROJECT
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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對
A	JAN. 16	EIA	
-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE 比例
A1 1 : 2500

DIMENSION UNIT 尺寸基位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1991)

SHEET NUMBER
圖紙編號

60334056/CAP/1991A

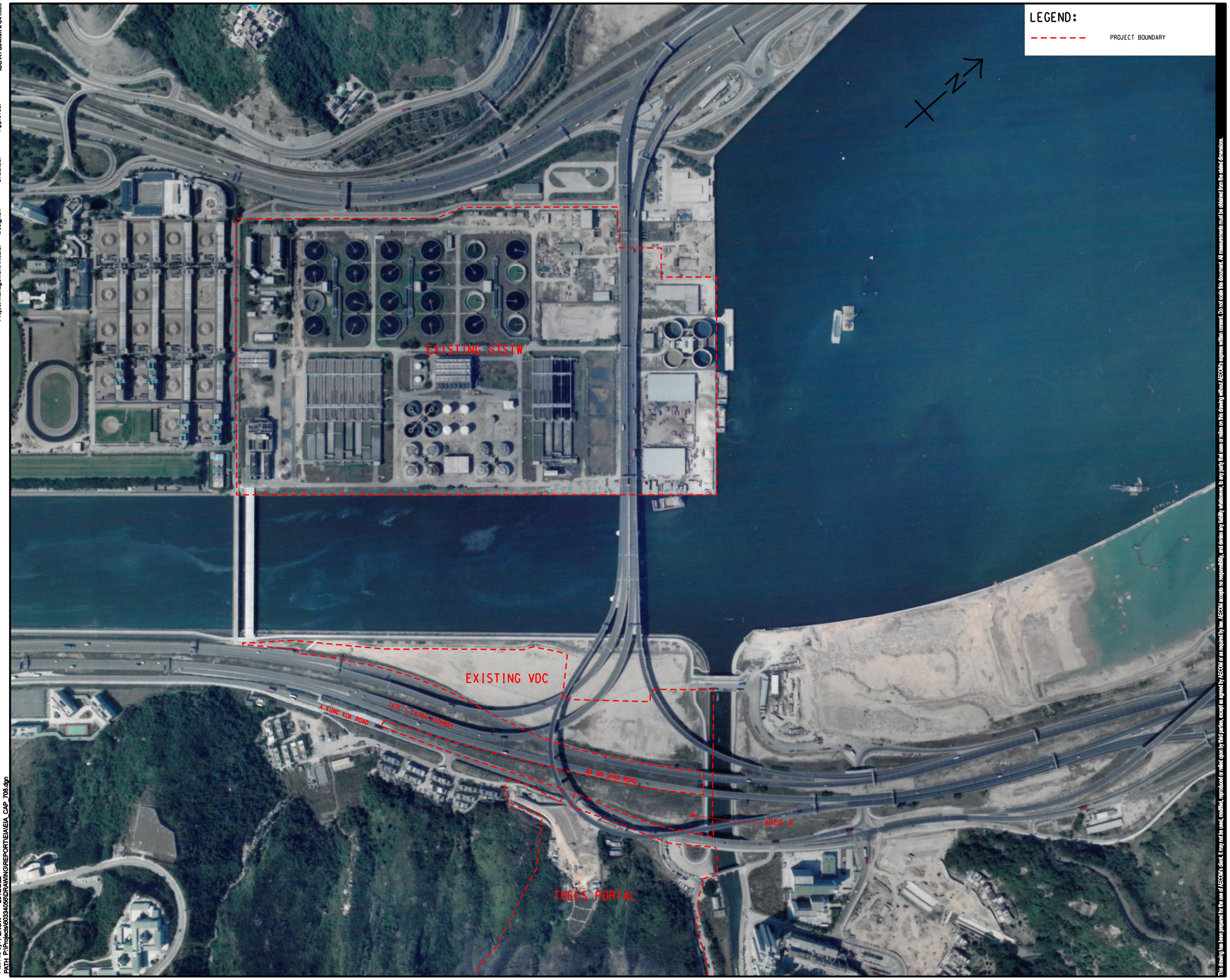
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

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-	SEP. 15	EIA (DRAFT)	

STATUS
階段

SCALE
比例

A1 1 : 2500

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60334056

CONTRACT NO.
合約編號

CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1993)

SHEET NUMBER
圖紙編號

60334056/CAP/1993B

Plot File by: PENGW 2016/3/22
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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/22
PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_718.dgn

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PROJECT
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階段

SCALE 比例
N.T.S.

DIMENSION UNIT 尺寸基位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (1994)

SHEET NUMBER
圖紙編號

60334056/CAP/1994B

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

LEGEND:

PROJECT BOUNDARY

EXISTING STSTW

TATE'S CAIRN HIGHWAY

MA ON SHAN ROAD

A KUNG KOK ROAD

EXISTING VDC

AREA A

THEES PORTAL

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PROJECT
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STATUS
階段

SCALE 比例
A1 1 : 2500

DIMENSION UNIT 尺寸基位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱
AERIAL PHOTOGRAPH (1995)

SHEET NUMBER
圖紙編號
60334056/CAP/1995B

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/22
PATH: P:\Projects\60334056\DRAWING\REPORTE\AIE\A CAP 710.dgn

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SCALE 比例
A1 1 : 2500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
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CONTRACT NO. 合約編號
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SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (2004)

SHEET NUMBER
圖紙編號

60334056/CAP/2004B

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

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PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP_711.dgn

AECOM

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STATUS
階段

SCALE 比例
A1 1 : 2000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

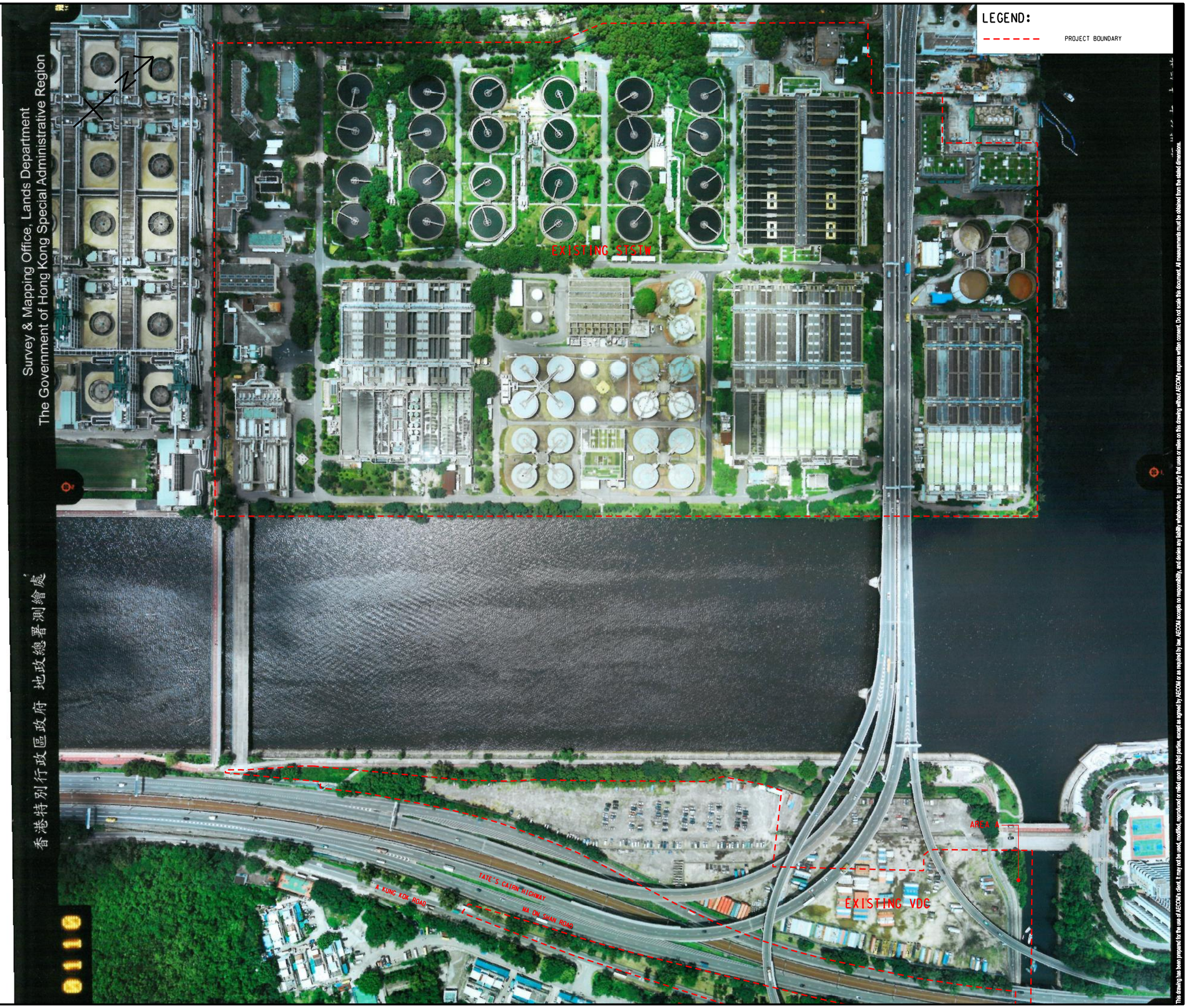
SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (2009)

SHEET NUMBER
圖紙編號

60334056/CAP/2009B

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm



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STATUS
階段

SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (2014)

SHEET NUMBER
圖紙編號

60334056/CAP/2014B

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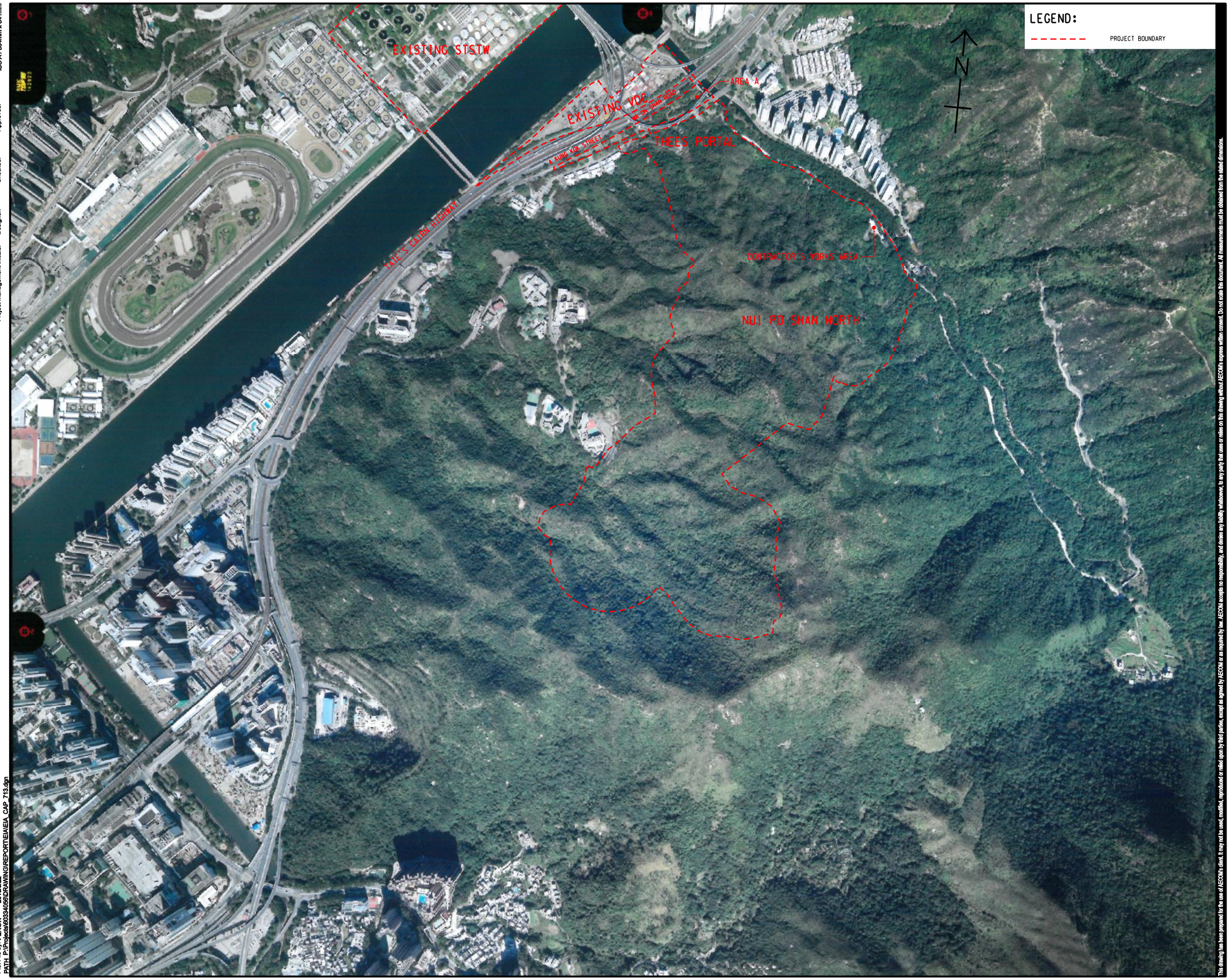

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: PENGW 2016/3/22
PATH: P:\Projects\60334056\DRAWING\REPORT\EIA\EIA_CAP 713.dgn

AECOM

PROJECT
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RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
階段

SCALE 比例
A1 1 : 5000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH (2015)

SHEET NUMBER
圖紙編號

60334056/CAP/2015B

CAP Appendix 2.03a

Site Walkover Checklist, Photographic Records and Standard Form 3.1 for Existing STSTW

[BLANK]

No.: A1	Date taken: 07/11/14

Location:

Chemical Waste Store

(Area: ~26m^2)

Description:

Room A: Spent Sulfuric Acid, Nitric Acid in liquid form

Room B: Spent Alkali

The chemical wastes in the store are protected from weather. The floor of the store is concreted paved and ventilation in the store is good.

No.: A2	Date taken: 07/11/14

Location:

Dangerous Goods Store

(Area: ~14m^2)

Description:

Room A: The bagged sodium hypochlorite (in powder form) is stored in the DG store and is protected from weather. The floor of the DG store is concreted paved and was observed in good condition.

AECOM Appendix 2.03a – Photographic Records of STSTW

No.: A3	Date taken: 07/11/14

Location:

Dangerous Goods Store

(Area: ~14m^2)

Description:

Room B: Paint and paint thinner are stored in the room.

The paint and thinner are protected from weather. The floor of the DG store is concreted paved and was observed in good condition.

No.: A4	Date taken: 07/11/14

Location:

Chemical Waste Area

(Area: ~42m^2)

Description:

Empty lubrication oil containers, grease containers, bleach drums and waste batteries

The chemical waste area has a metal roof and the floor of the area is concreted paved with bundings and was observed in good condition.

No.: A5	Date taken: 07/11/14

Location:

Scrap Iron Storage Area

(Area: ~21m^2)

Description:

Metal scrap generated within STSTW were temporary stored in this concrete paved storage area with fences surrounding the locked area.

No.: A6	Date taken: 07/11/14

Location:

Chemical Waste Collecting Tank

(Area: ~34m^2)

Description:

The chemical waste collecting tank is situated on top of a concrete paved area with concrete bunding to prevent spilling and leakage.

AECOM Appendix 2.03a – Photographic Records of STSTW

No.: A7	Date taken: 07/11/14

Location:

Mechanic Workshop

(Area: ~1090m^2)

Description:

The workshop is concrete paved. Repair and maintenance of valve bodies, spindles pumps and other light machine take place in it. No oil stain was observed.

No.: A8	Date taken: 28/01/15

Location:

Administration and Laboratory Buildings

(Area: 1470m^2)

Description:

Laboratory is on the first floor of the building.

Ground floor is used only as exhibition center and storeroom. No chemicals were found stored on the ground floor.

No.: A9	Date taken: 03/11/14

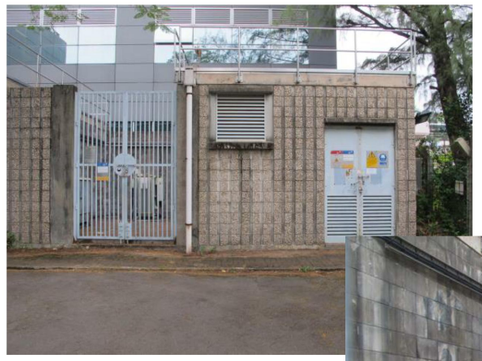
Location:

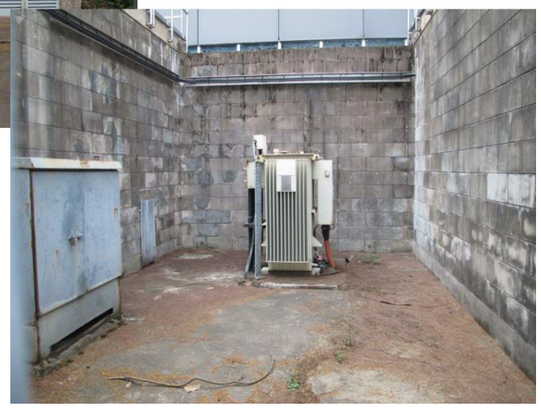
CLP Transformer No.1 for Staff Accommodation Block

(Area: ~29m^2)

Description:

CLP Transformer No. 1 is operated by CLP and located within the substation. Ground are concrete paved and without stains.





No.: A10	Date taken: 03/11/14

Location:

Transformer No.19 & 20

Description:

Transformer No. 19 and No. 20 are housed within the transformer rooms. The transformer rooms are elevated on an approximately 0.5m concrete platform.

AECOM Appendix 2.03a – Photographic Records of STSTW

No.: A11	Date taken: 07/11/14

Location:

Chemical Store

(Area: ~166m^2)

Description:

The store is used for storage of chemicals (mainly lubrication oil).

The chemical store has a metal roof and the floor of the store is concreted paved with good ventilation. No sign of spillage or stain was observed.

No.: A12	Date taken: 07/11/14

Location:

Fuel Oil Tanks

Description:

Two ~1000L aboveground diesel oil tanks used by STSTW power house's generator.

No.: A13	Date taken: 17/07/15

Location:

Diesel Filling Point

Description:

A diesel filling point was observed near the diesel storage tank.

No.: A14	Date taken: 07/11/14

Location:

Transformer No.21 & 22

Description:

Two transformers (labeled as 'Transformer No. 21' and '22') were located at the western side of the Power House.

AECOM Appendix 2.03a – Photographic Records of STSTW

No.: A15	Date taken: 7/11/14 & 28/01/15

Location:

Power House

(Area: ~2470m^2)

Description:

Six set of power generators and five set of air blowers supply energy for the treatment plant. Fuel and lubrication oil were being used in daily operation.

A temporary chemical waste collecting point for lubrication oil bottles and oil drums was observed at entrance of the building.

No.: A16	Date taken: 28/01/15

Location:

Boiler House

(Area: ~231m^2)

Description:

Four set of hot water boiler located within the building, no fuel or lubricant is needed for the boiler to operate.

No oil stain was observed inside the building.

No.: A17	Date taken: 17/07/15

Location:

Transformer No.11 and 12

Description:

There are 2 transformers (labeled as Transformer No. 11 to 12) near the Power House for the operation of the Boiler House. The transformers are housed within the transformer rooms. The transformer rooms are elevated on an approximately 1.0m concrete platform. No stains were observed on the floor.

No.: A18	Date taken: 17/07/15

Location:

Transformer No.13 to 18

Description:

There are 6 transformers (labeled as Transformer No. 13 to 18) near the Power House for the operation of the Power House. The transformers are housed within the transformer rooms. The transformer rooms are elevated on an approximately 1.0m concrete platform. No stains were observed on the floor.

Appendix 2.03a – Photographic Records of STSTW

No.: A19	Date taken: 28/01/15

Location:

Waste Gas Burners

(Area: ~36m^2)

Description:

Two set of waste gas burners are located within the treatment plant, to remove methane gas produced from digestion/sludge holding tanks.

No.: A20	Date taken: 28/01/15

Location:

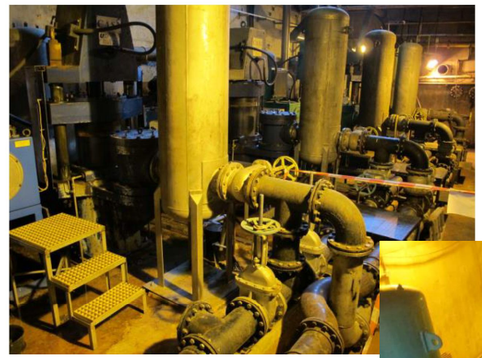
Sludge Thickening House

(Area: ~ 890m^2)

Description:

Sludge thickening receiving tanks and cold water receiving tanks were observed in the building.

Concrete paved ground is in good condition and no sign of spillage or stain was observed.



No.: A21	Date taken: 17/07/15

Location:

Transformer No.5, 6 and A

Description:

Transformers No.5 and 6 are located in front of the sludge thickening house, functioning for the SAS thickening house. Transformer A is located behind the sludge thickening house. They are situated on an elevated concrete paved floor with secured gate.

Transformer A

Transformer No.5 and 6

No.: A23	Date taken: 17/07/15

Location:

Transformer No.1 to 4

Description:

There are 4 transformers (labeled as Transformer No. 1 to No. 4). The room is paved with concrete and no stains were observed.

No.: A22	Date taken: 28/01/15

Location:

Air Blower House

(Area: 1307m^2)

Description:

Six air blowers located at the Air Blower House, situated on concrete paved floor with a metal shield surrounded.

Numbers of oil drum are temporary stored on either plastic shelve or metal trolley.

No oil stain or spillage was observed.

No.: A24	Date taken: 28/01/15

Location:

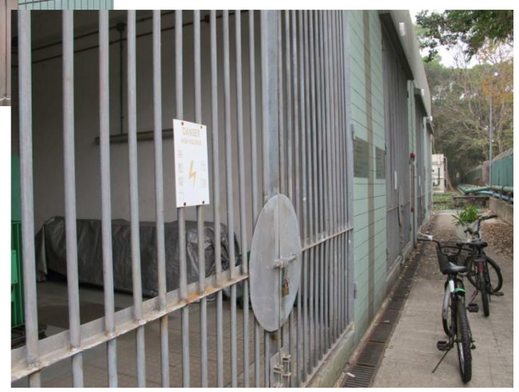
Switchgear House and Transformer No. 7 to 10

(Area: ~288m^2)

Description:

Use as switch room with control panels. 4 transformers are situated at the back of the building

No stain inside the building or stress of vegetation in the surrounding area is observed.



No.: A25	Date taken: 28/01/15

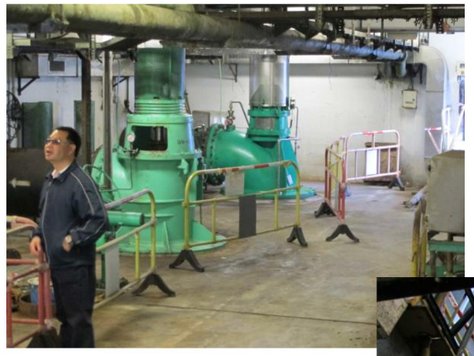
Location:

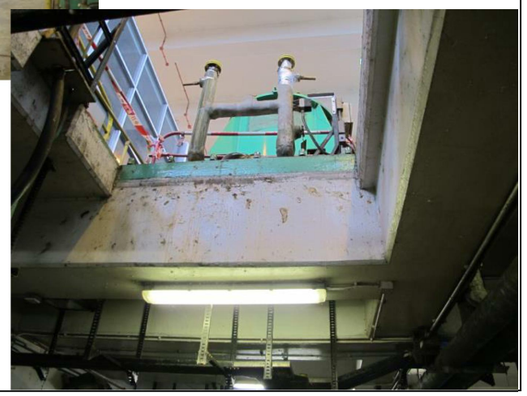
Effluent Pumping Station

(Area: 619m^2)

Description:

Four set of effluent pumps are located within the building. Turbine of the pump that required use of lubricant is located on the first floor.





No.: A26	Date taken: 17/07/15

Location:

Transformer No.25 and 26

Description:

There are 2 transformers (labeled as Transformer No. 25 to No. 26) near the Effluent Pumping Station. The transformers are on an elevated concrete platform of approximately 0.5m thick. No stains were observed on the floor.

AECOM Appendix 2.03a – Photographic Records of STSTW

No.: A27	Date taken: 28/01/15

Location:

Sludge Dewatering House

(Area: 1340m^2)

Description:

Eight centrifuges are located on the first floor of the building and their control panels are based on the ground floor.

No.: A28	Date taken: 28/01/15

Location:

Water Reclamation House

(Area: 312m^2)

Description:

Major part of the building is used as information center for visitor.

The remaining portions are used for water reclamation (e.g. ultrafiltration and reverse osmosis system).

.

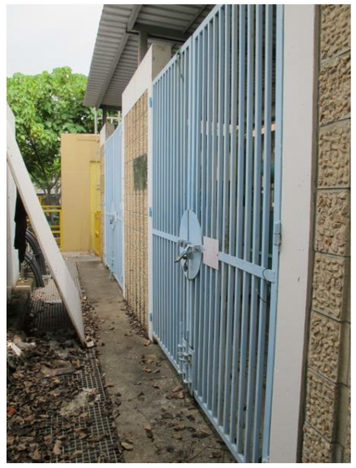
No.: A29	Date taken: 07/11/14 & 17/07/15

Location:

Transformer No.23 and 24

Description:

There are 2 transformers (labeled as Transformer No. 23 and 24) for the Water Reclamation House. The transformers are on an elevated concrete platform of approximately 0.5m thick. No stains were observed on the floor.



Appendix 2.03a – Photographic Records of STSTW

No.: A31	Date taken: 28/01/15

Location:

RAS Pumping Stations

(Area: ~168m^2 per Station)

Description:

A total of 5 RAS pumping stations situated in different area of the treatment plant and all building are fully concrete paved

Pumps are located on the first floor and control panel and pipe lines are located on ground floor.

No.: A30	Date taken: 28/01/15

Location:

Sludge Transfer Pumping Station

(Area: 475m^2)

Description:

Sludge pumps are located on the first floor of the building and for the ground floor, only transfer pipes were observed, no lubricant is needed for pipe line.

Standard Form 3.1
Summary of On-Site Land Use

Property Name: Shatin Sewage Treatment Works (STSTW)

Current Use

Type of facility/ business	On-site property land use	Date began[1]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property	Off-site property affected? ____ Yes ____No
Sewage Treatment Works	Industrial	1982	Sewage Treatment	Drainage Services Department	280,000m^2	No

Past Use

Are past uses different from current uses? ____ Yes __✓__ No If Yes, complete this section.

Complete this table with each different operation, use , or status of the on-site property. Include all operations back to pre-commercial or pre-industrial time if this information is necessary to characterize the site. Specify the status of the property at each stage, including times it may have been vacant. Start with the most recent use and list in chronological order backwards through time.

Type of facility/ business	On-site property land use	Date began[2]	Date ended[3]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property	Off-site property affected? ____ Yes ____No

Future Use

Will future uses be different from current uses? __✓__ Yes ____ No If Yes, complete this section.

Type of facility/ business	On-site property land use[4]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property
Housing	Urban residential	Residential development	N/A	280,000m^2

[1] Specify the approximate year in which the current use of the on-site property began.
[2] Specify the approximate year in which the past use of the on-site property began.
[3] Specify the approximate year in which the past use of the on-site property ended.
[4] Specify all applicable land use including urban residential, rural residential, industrial or public parks.

Annex C1
Site Walkover Checklist

GENERAL SITE DETAILS

SITE OWNER/CLIENT Hong Kong Drainage Services Department

PROPERTY ADDRESS Shatin Sewage Treatment Works, 1 Shui Chong Street, Ma Liu Shui, Shatin, N.T

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Matthew Lee (AECOM)

POSITION Environmental Consultant

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Mr. Ng Kwok-keung (Drainage Services Department)

POSITION Senior Mechanical Inspector

TELEPHONE 2684 1063

SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled. **Obtain a flow schematic if possible.**

Number of employees: Full-time: 89 (as on 7/11/14)
Part-time: n/a (as on 7/11/14)
Temporary/Seasonal: n/a (as on 7/11/14)

Maximum no. of people on site at any time: Uncountable

Typical hours of operation: 24 hrs

Number of shifts: 3

Days per week: 7 Days

Weeks per year: All days throughout the year

Scheduled plant shut-down: n/a

Detail the main sources of energy at the site:

Gas Yes/~~No~~

Electricity Yes/~~No~~

Coal ~~Yes~~/No

Oil Yes/~~No~~

Other ~~Yes~~/No

SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: 28 hectares

What area of the site is covered by buildings (%): ~ 40%

Please list all current and previous owners/occupiers if possible.

Drainage Services Department

Is a site plan available? If yes, please attach. Yes/~~No~~

Are there any other parties on site as tenants or sub-tenants? ~~Yes~~/No

If yes, identify those parties: Not Applicable

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Urban residential, hotel and university

South: Racecourse

East: Shing Mun River

West: Industrial (MTR and Highway)

Annex C1
Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Reclaimed land and surrounded by large body of water (Sha Tin Hoi and Shing Mun River) to the East and Northeast

State the size and location of the nearest residential communities.

Residential area along Kau To Shan Road, ~approx. 200m to 350m to the west of the Study Area

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

~~Questionnaire with Existing/Previous Site Owner or Occupier~~

		Yes/No	Notes
1.	What are the main activities/operations at the above address?	--	Sewage treatment works
2.	How long have you been occupying the site?	--	Since 1982
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	Yes	
4.	Prior to your occupancy, who occupied the site?	--	Not applicable
5.	What were the main activities/operations during their occupancy?	--	Not applicable
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	Stage III Extension commenced in 2001
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Lubricating oil and fuels for pumps and power generation, NaOH, NaOCl, Fe(III)Cl for sewage treatment
	• Where do you store these chemicals?	--	Dangerous goods room, chemical storage room, aboveground tank and cylinder
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	Yes	Representative unavailable to provide the list
13.	Has the facility produced a separate hazardous substance inventory?	Yes	Representative unavailable to provide the list
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	

		Yes/No	Notes
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	--	By truck and lorry and stored in above-ground tanks and cylinders
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
	• How many underground storage tanks do you have on site?	--	Not applicable
	• What are the tanks constructed of?	--	Not applicable
	• What are the contents of these tanks?	--	Not applicable
	• Are the pipelines above or below ground?	--	Not applicable
	• If the pipelines are below ground, has any leak and integrity testing been performed?	--	Not applicable
	• Have there been any spills associated with these tanks?	--	Not applicable
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	Yes	Monitoring system for tanks and cylinders
19.	How are the wastes disposed of?	--	Temporarily stored in chemical waste store, chemical waste collecting tank and chemical waste area. Licensed chemical waste collector will collect the waste for proper disposal.
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	Yes	Public complaint on odour
21.	Have any spills occurred on site? (If yes, please provide details.)	No	
	• When did the spill occur?	--	Not applicable
	• What were the substances spilled?	--	Not applicable
	• What was the quantity of material spilled?	--	Not applicable
	• Did you notify the relevant departments of the spill?	--	Not applicable
	• What were the actions taken to clean up the spill?	--	Not applicable
	• What were the areas affected?	--	Not applicable
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Annex C1
Site Walkover Checklist

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	Yes	Floors of chemical waste store, chemical store and dangerous goods store are concrete paved, chemicals are place on shelves. Chemical tank and cylinder has bund wall
2.	What are the conditions of the bund walls and floors?	--	Both are in good condition
3.	Are any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	Yes	Spent lube oil, waste battery, grease, scrap
5.	Is there a storage site for the wastes?	Yes	Chemical waste and refuse collection point
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	Yes	Transformers
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	Yes	Tanks are used for sewage treatment
12.	Any noticeable odours during site walkover?	Yes	Odour from sewage
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Yes	Fuels, lubricating oil, sodium hydroxide.

CAP Appendix 2.03b

Site Walkover Checklist, Photographic Records and Standard Form 3.1 for Vehicle Detention Centre and its Surrounding Area

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No.: B7	Date taken: 17/07/15

Location:
Cycling track and footpath outside the vehicle detention centre (VDC) of the Northeastern part of Area A

Description:

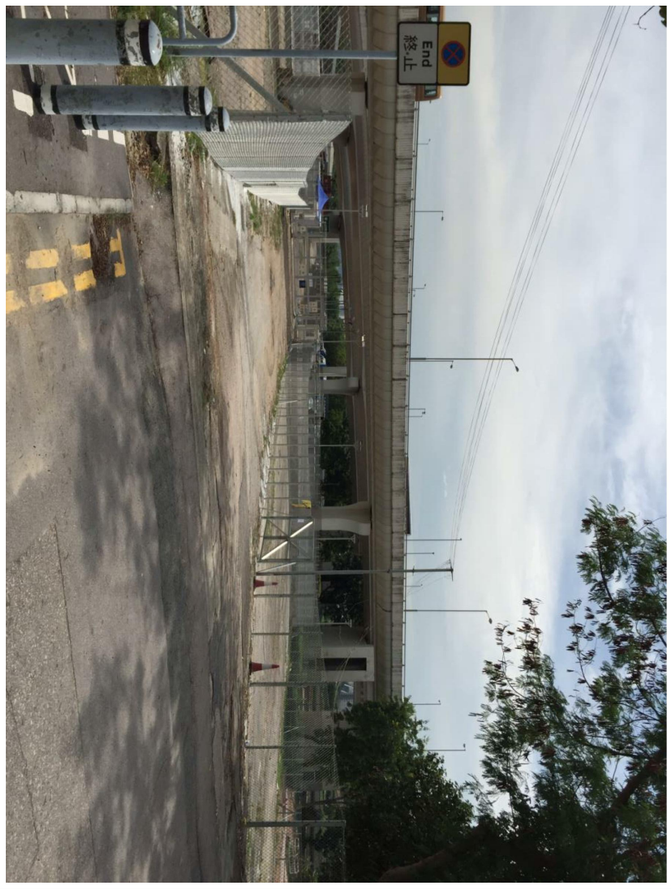
The area is consisted of concrete paved bicycle track, foot path and fenced vacant area.

No.: B8	Date taken: 17/07/15

Location:
End of Hang Tai Road at the main entrance of VDC in Area A

Description:

Photo showing the concreted paved road and fenced VDC area.



Standard Form 3.1
Summary of On-Site Land Use

Property Name: Sha Tin Vehicle Detention Centre

Current Use

Type of facility/ business	On-site property land use	Date began[1]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property	Off-site property affected? ____ Yes ____No
Vehicle Detention Centre	Industrial	2004	Vehicle Detention	Hong Kong Customs and Excise Department	48,000m^2	No

Past Use

Are past uses different from current uses? __✓__ Yes ____ No If Yes, complete this section.

Complete this table with each different operation, use , or status of the on-site property. Include all operations back to pre-commercial or pre-industrial time if this information is necessary to characterize the site. Specify the status of the property at each stage, including times it may have been vacant. Start with the most recent use and list in chronological order backwards through time.

Type of facility/ business	On-site property land use	Date began[2]	Date ended[3]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property	Off-site property affected? ____ Yes ____No
Construction site	Industrial	2002	2003	Construction	Unknown	48,000m^2	No
Car Park	Industrial	1995	2002	Car Park	Unknown	48,000m^2	No
Construction site	Industrial	1993	1995	Construction	Unknown	48,000m^2	No
Vacant	N/A	1985	1993	N/A	N/A	48,000m^2	No

Future Use

Will future uses be different from current uses? ____ Yes __✓__ No If Yes, complete this section.

Type of facility/ business	On-site property land use[4]	Description of business process/ primary products	Owner or Occupier	Approximate size of on-site property
Ancillary facilities of relocated STSTW	Industrial	Ancillary facilities of relocated STSTW	Drainage Services Department	48,000m^2

[1] Specify the approximate year in which the current use of the on-site property began.
[2] Specify the approximate year in which the past use of the on-site property began.
[3] Specify the approximate year in which the past use of the on-site property ended.
[4] Specify all applicable land use including urban residential, rural residential, industrial or public parks.

Annex C1
Site Walkover Checklist

GENERAL SITE DETAILS

SITE OWNER/CLIENT Hong Kong Customs and Excise Department

PROPERTY ADDRESS Sha Tin Vehicle Detention Centre, 39 Hang Tai Road, Tai Shui Hang, Shatin

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Victor Leung (AECOM)

POSITION Assistant Environmental Consultant

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Mr. Lam (Customs and Excise Department)

POSITION Storehouse staff

TELEPHONE 2647 1895

SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled. **Obtain a flow schematic if possible.**

Number of employees: Full-time: 26 (as on 14/11/14)

Part-time: 0 (as on 14/11/14)

Temporary/Seasonal: 0 (as on 14/11/14)

Maximum no. of people on site at any time: n/a (based on operational needs)

Typical hours of operation: 24 hrs

Number of shifts: 3

Days per week: 7 Days

Weeks per year: 52 Weeks

Scheduled plant shut-down: n/a

Detail the main sources of energy at the site:

Gas ~~Yes~~/No

Electricity Yes/~~No~~

Coal ~~Yes~~/No

Oil ~~Yes~~/No

Other ~~Yes~~/No

SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: 45,828 m^2 (as of 14/11/2014) 37,994 (after 08/07/2015)

What area of the site is covered by buildings (%): ~1 %

Please list all current and previous owners/occupiers if possible.

Current occupier: Hong Kong Customs and Excise Department;
Previous owner: Lands Department

Is a site plan available? If yes, please attach. ~~Yes~~/No

Are there any other parties on site as tenants or sub-tenants? ~~Yes~~/No

If yes, identify those parties: Not Applicable

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Sha Tin Hoi and urban residential (Kam Tai Court)

South: Low density residential (Ah Kung Kok Fishermen Village) and Vegetation

East: Vegetation

West: Shing Mun River

Annex C1
Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Reclaimed/flat land and surrounded by a large body of water (Shing Mun River / Sha Tin Hoi) to the West and Northwest

State the size and location of the nearest residential communities.

Kam Tai Court (~120m Northeast, ~44500m^2), Chevalier Garden (~250m East, ~60000m^2) and Ah Kong Kok Fisherman Village (~150m South, ~11000m^2)

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

Questionnaire with Existing/Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities/operations at the above address?	--	Vehicle detention centre
2.	How long have you been occupying the site?	--	Since July, 2003 - Phase I (24,900 m^2) operated in July 2005 - Phase II (20,928 m^2) operated in April 2008
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	
4.	Prior to your occupancy, who occupied the site?	--	Lands Department
5.	What were the main activities/operations during their occupancy?	--	Not applicable
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Pest control Exercise as quarterly basis
•	Where do you store these chemicals?	--	
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	--	Not applicable
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	--	Not applicable
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
•	How many underground storage tanks do you have on site?	--	Not applicable
•	What are the tanks constructed of?	--	Not applicable
•	What are the contents of these tanks?	--	Not applicable
•	Are the pipelines above or below ground?	--	Not applicable
•	If the pipelines are below ground, has any leak and integrity testing been performed?	--	Not applicable
•	Have there been any spills associated with these tanks?	--	Not applicable
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	--	Not applicable
19.	How are the wastes disposed of?	--	Not applicable
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	Yes	Letter from Mr. CHIU, Shatin DC member on VDC's hygiene issue on 24/07/2013
21.	Have any spills occurred on site? (If yes, please provide details.)	No	
•	When did the spill occur?	--	Not applicable
•	What were the substances spilled?	--	Not applicable
•	What was the quantity of material spilled?	--	Not applicable
•	Did you notify the relevant departments of the spill?	--	Not applicable
•	What were the actions taken to clean up the spill?	--	Not applicable
•	What were the areas affected?	--	Not applicable
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	--	Not applicable
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Annex C1

Site Walkover Checklist

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	--	Not applicable
2.	What are the conditions of the bund walls and floors?	--	Not applicable
3.	Are any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5.	Is there a storage site for the wastes?	No	
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	No	
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	No	

CAP Appendix 2.03c

Site Walkover Checklist, Photographic Records for Nui Po Shan North

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No.: C1	Date taken: 17/07/15

Location:

Evangelical Lutheran Church of Hong Kong, David Camp,
59A A Kung Kok Street.

Description:

Religious camp site consisting of 2 single storey structures, footpaths and vegetation.

No.: C2	Date taken: 17/07/15

Location:

Mui Tsz Lam Road, near the intersection of Mui Tsz Lam Road and A Kung Kok Street

Description:

General view of the area with vegetated land and paved road.

Appendix 2.03c – Photographic Records of Nui Po Shan North

No.: C3	Date taken: 24/07/15

Location:

THEES Portal

Description:

Entrance / access road and overall view of the site. Above ground features, including the valve chamber, concrete inlet chamber and switch room, are located at the top of the site. The area is mainly paved with concrete and surrounded by vegetation without stains.

No.: C4	Date taken: 17/07/15

Location:
Roundabout at the end of A Kung Kok Shan Road.

Description:
Near 'The Neighbourhood Advice-action Council Harmony Manor'. The proposed project boundary covers the vegetated land to the right and Nui Po Shan at the back.

No.: C5	Date taken: 17/07/15

Location:
A Kung Kok Shan Road, near the roundabout at the end of A Kung Kok Shan Road

Description:
Proposed area for the Ah Kung Kok Shan Road Surface Magazine Site. The area mainly covered by vegetation.

Appendix 2.03c – Photographic Records of Nui Po Shan North

No.: C6	Date taken: 17/07/15

Location:
Mui Tsz Lam Road, west of the Contractor's Works Area

Description:
The area of the project boundary (to the left of Mui Tsz Lam Road) is undeveloped and mainly covered by vegetation.

Appendix 2.03c – Photographic Records of Nui Po Shan North

No.: C7	Date taken: 24/07/15

Location:

Contractor's Works Area

Description:
Engineer's site office, car parking area and construction materials storage area (e.g. fences etc). The area was mainly paved with intact concrete with no stains observed.

No.: C8	Date taken: 24/07/15

Location:
Contractor's Works Area

Description:
Contractor's site office, car parking area and construction materials storage area (e.g. metal reinforcement bars/sheets etc). The area was mainly paved with intact concrete with no stains observed.

Annex C1
Site Walkover Checklist

GENERAL SITE DETAILS

SITE OWNER/CLIENT Welcome Construction Co., Ltd.

PROPERTY ADDRESS 30 Mui Tsz Lam Road
Tai Shui Hang, Sha Tin, N.T.

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Kelvin Chiang (AECOM)

POSITION Environmental Consultant

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Mr. Tsui Kam Chuen (Welcome Construction Co., Ltd.)

POSITION Site Agent

TELEPHONE 6345 2454

SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled. **Obtain a flow schematic if possible.**

Number of employees: Full-time: 20

Part-time: N/A

Temporary/Seasonal: N/A

Maximum no. of people on site at any time: 20

Typical hours of operation: 10 hrs

Number of shifts: 1

Days per week: 6 Days

Weeks per year: 52 Weeks

Scheduled plant shut-down: N/A

Detail the main sources of energy at the site:

Gas ~~Yes~~/No

Electricity Yes/~~No~~

Coal ~~Yes~~/No

Oil ~~Yes~~/No

Other ~~Yes~~/No

SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: ~2500m^2

What area of the site is covered by buildings (%): ~10%

Please list all current and previous owners/occupiers if possible.

Current occupier: Welcome Construction Company Ltd.; Previous occupier: Unknown

Is a site plan available? If yes, please attach. ~~Yes~~/No

Are there any other parties on site as tenants or sub-tenants? ~~Yes~~/No

If yes, identify those parties: Not Applicable

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Mui Tsz Lam Road

South: Vegetation (Niu Po Shan)

East: Mui Tsz Lam Road

West: Vegetation (Niu Po Shan)

Annex C1
Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Vegetation to the south and west, rolling hills

State the size and location of the nearest residential communities.

Chevalier Garden (~67m North East, ~60000m^2)

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

Questionnaire with Existing/Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities/operations at the above address?	--	Site office
2.	How long have you been occupying the site?	--	Since February 2009
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	
4.	Prior to your occupancy, who occupied the site?	--	Not known
5.	What were the main activities/operations during their occupancy?	--	Not applicable
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	Yes	Boreholes in the surrounding area
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	
	• Where do you store these chemicals?	--	
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	

		Yes/No	Notes
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	--	Construction materials only; received by trucks
16.	Do you have any underground storage tanks? (If yes, please provide details.)	Yes	Sewage tank
	• How many underground storage tanks do you have on site?	--	Two sewage tanks on site
	• What are the tanks constructed of?	--	Concrete
	• What are the contents of these tanks?	--	Sewage
	• Are the pipelines above or below ground?	--	Below ground
	• If the pipelines are below ground, has any leak and integrity testing been performed?	No	
	• Have there been any spills associated with these tanks?	No	
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	--	No chemicals being handled.
19.	How are the wastes disposed of?	--	Waste (general refuse) collected by trucks
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have any spills occurred on site? (If yes, please provide details.)	No	
	• When did the spill occur?	--	
	• What were the substances spilled?	--	
	• What was the quantity of material spilled?	--	
	• Did you notify the relevant departments of the spill?	--	
	• What were the actions taken to clean up the spill?	--	
	• What were the areas affected?	--	
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	--	No disused underground tanks.
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Annex C1
Site Walkover Checklist

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	--	No chemicals observed on-site.
2.	What are the conditions of the bund walls and floors?	--	Not applicable
3.	Are any surface water drains located near to drum storage and unloading areas?	--	Not applicable
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	Yes	General refuse only; collected by waste collector.
5.	Is there a storage site for the wastes?	Yes	General refuse at designed areas.
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	No	
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	No	

Annex C1
Site Walkover Checklist

GENERAL SITE DETAILS

SITE OWNER/CLIENT Drainage Services Department

PROPERTY ADDRESS THEES Portal; A Kung Kok Street

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Kelvin Chiang (AECOM)

POSITION Environmental Consultant

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Mr. Ng Kwok-keung (Drainage Services Department)

POSITION Senior Mechanical Inspector

TELEPHONE 2684 1063

SITE ACTIVITIES

Briefly describe activities carried out on site, including types of products/chemicals/materials handled.
Obtain a flow schematic if possible.

Number of employees: Full-time: None

Part-time: None

Temporary/Seasonal: None

Maximum no. of people on site at any time: N/A

Typical hours of operation: N/A

Number of shifts: N/A

Days per week: N/A

Weeks per year: N/A

Scheduled plant shut-down: N/A

Detail the main sources of energy at the site:

Gas ~~Yes~~/No

Electricity Yes/~~No~~

Coal ~~Yes~~/No

Oil ~~Yes~~/No

Other ~~Yes~~/No

SITE DESCRIPTION

This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.

What is the total site area: ~2070 m^2

What area of the site is covered by buildings (%): ~1 %

Please list all current and previous owners/occupiers if possible.

Current occupier: Drainage Services Department

Is a site plan available? If yes, please attach. ~~Yes~~/No

Are there any other parties on site as tenants or sub-tenants? ~~Yes~~/No

If yes, identify those parties: Not Applicable

Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: A Kung Kok Street

South: Vegetation (Niu Po Shan)

East: Vegetation (Niu Po Shan)

West: Ah Kung Kok Fishermen Village

Annex C1
Site Walkover Checklist

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).

Vegetation to the east and south, rolling hills

State the size and location of the nearest residential communities.

Ah Kong Kok Fisherman Village (~14m Southwest, ~11000m^2) and Evangelical Lutheran Church of Hong Kong David Camp (~17m North, ~1200m^2)

Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?

No

Questionnaire with Existing/Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities/operations at the above address?	--	Inlet of THEES effluent
2.	How long have you been occupying the site?	--	Since 1994
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	--	Unknown
4.	Prior to your occupancy, who occupied the site?	--	Unknown
5.	What were the main activities/operations during their occupancy?	--	Unknown
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	
9.	Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	Yes	Boreholes in the surrounding area
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	
	• Where do you store these chemicals?	--	
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	--	Not applicable
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	--	Not applicable
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
	• How many underground storage tanks do you have on site?	--	Not applicable
	• What are the tanks constructed of?	--	Not applicable
	• What are the contents of these tanks?	--	Not applicable
	• Are the pipelines above or below ground?	--	Not applicable
	• If the pipelines are below ground, has any leak and integrity testing been performed?	--	Not applicable
	• Have there been any spills associated with these tanks?	--	Not applicable
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	--	No chemicals handled.
19.	How are the wastes disposed of?	--	No wastes disposed of.
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have any spills occurred on site? (If yes, please provide details.)	No	
	• When did the spill occur?	--	Not applicable
	• What were the substances spilled?	--	Not applicable
	• What was the quantity of material spilled?	--	Not applicable
	• Did you notify the relevant departments of the spill?	--	Not applicable
	• What were the actions taken to clean up the spill?	--	Not applicable
	• What were the areas affected?	--	Not applicable
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	--	No disused underground tanks.
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Annex C1
Site Walkover Checklist

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	--	No chemicals observed on-site.
2.	What are the conditions of the bund walls and floors?	--	Not applicable
3.	Are any surface water drains located near to drum storage and unloading areas?	--	Not applicable
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5.	Is there a storage site for the wastes?	No	
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	No	
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	No	

CAP Appendix 2.04

Replies from Environmental Protection Department and Fire Services Department

[BLANK]

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com

+852 3922 9000 tel
+852 3922 9797 fax

Our ref : CYKY:KWGH:ccm:60334056/2.1-2014013312W

30 October 2014

By Fax (2685 1133) and Post

Environmental Protection Department
Regional Office (North)
10/F, Sha Tin Government Offices,
No.1 Sheung Wo Che Road, Sha Tin,
New Territories, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Request for Information of Chemical Waste Producer and Chemical Spillage Accident

We are the consultant appointed by Drainage Services Department (DSD) for the captioned Agreement. A copy of a self-explanatory memo dated 8 Oct 2014 issued by DSD is enclosed for your reference.

The areas of concern (the *Concerned Areas)* for the land contamination assessment include the existing Sha Tin Sewage Treatment Works and the Customs and Excise Department's Sha Tin Vehicle Detention Centre. The Concerned Areas are shown in Figure A attached.

As part of the land contamination assessment and following the *Practice Guide for Investigation and Remediation of Contaminated Land* issued by Environmental Protection Department (EPD), we have to collect historical information regarding the past and present activities of the Concerned Areas. In this regard, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment:

- Current and past (early as the records are available) registered Chemical Waste Producer(s) within the Concerned Areas (preferably with the registration date, status (moved out or active), nature and quantity of the major chemical waste); and

- Reported accidents of spillage/leakage of chemicals within the Concerned Areas.

Your assistance in this matter will be greatly appreciated. Should you have any queries, please feel free to contact the undersigned at 3922 9345 or our Mr. Matthew Lee at 3922 9439.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Associate Director
Water & Urban Development, Hong Kong

Encl.

cc CE/Sewerage Projects, DSD - Attn: Mr. K.H. Chan] w/e.

MEMO **Urgent by Fax**

From	Chief Engineer/Sewerage Projects, DSD	To	Distribution
Ref.	( ) in SP/8/4399DS/CE3014(DS)	Attn.:	
Tel. No.	2594 7460	Email	
Fax. No.	2827 8700	Your Ref.	
Email	khchan06@dsd.gov.hk	Dated	Fax. No.
Date	8 October 2014	Total Pages	3 + Encl.

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works
– Investigation, Design and Construction

We wish to inform you that AECOM Asia Company Ltd. (AECOM) has been appointed to undertake the captioned Assignment. The Assignment commenced on 29 September 2014.

2. The scope of the Assignment mainly comprises:

(a) preliminary and detailed design of cavern sewage treatment system (CSTS) for the relocated Sha Tin Sewage Treatment Works (STSTW);

(b) preliminary design of upstream sewerage and pumping station (USPS), including diversion of sewage to the relocated STSTW and diversion of effluent from the Tai Po Sewage Treatment Works (TPSTW) to the existing Tolo Harbour Effluent Export Scheme (THEES) tunnel in relation to the relocation of the STSTW to caverns;

(c) detailed impact assessments on environment, traffic, geotechnical, sewerage, drainage, waterworks, utilities, blasting vibration and other relevant aspects;

(d) public engagement and consultation exercises with relevant stakeholders;

(e) tendering and supervision for the associated site investigation works; and

(f) tendering and supervision for the future construction works for the relocation project, except USPS, which are "phases subject to incorporation".

The layout plan showing the preliminary location of the relocated STSTW is enclosed for your ease of reference.

3. During the course of the Assignment, AECOM may approach your Department/Office direct to search for information, to seek your comments/approvals where appropriate, or to seek other assistance relating to the Assignment. We should be grateful if you would render the necessary assistance to them.

4. Should you have any further enquiry, please feel free to contact our Engineers, Ms. Agnes P. F. YIU (Tel: 2594 7459), Mr. William H. M. WONG (Tel: 2594 7457) or the undersigned.

5. Thank you for your assistance in advance.

(Benjamin K. H. CHAN)
for Chief Engineer/Sewerage Projects
Drainage Services Department

Encl.

ISO A3 297mm X 420mm

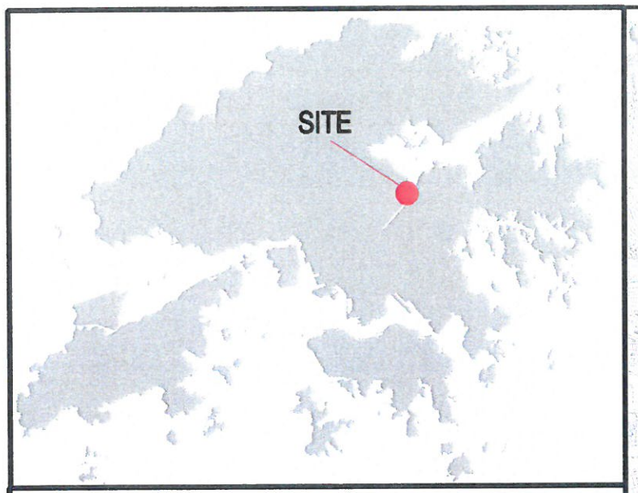
Checked: —

Project Management Initials:

Plot File by: LEETHM 29/10/2014
PATH $FILES

AECOM

Figure A



KEY PLAN

SHA TIN SEWAGE TREATMENT PLANT

SHA TIN HOI

SHATIN KNOLL

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

KAM TAI COURT

TOLO HIGHWAY

TAI SHUI HANG

CHEVALIER GARDEN

SHA TIN RACECOURSE

SHING MUN RIVER

SHEK MUN

PENFOLD PARK

LEGEND:

EXISTING SHA TIN SEWAGE TREATMENT WORKS (STSTW)

CURRENT CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

GENERAL SITE LAYOUT

CE30/2014 - RELOCATION OF STSTW - IDC

Project No.: 60334056 Date: OCT. 2014

Scale: 1 : 6000 (A3)

本署檔案 OUR REF: EPCW/D2226/753-10
來函檔案 YOUR REF: CYKY:KWGH:ccm:60334056/2.1-20140131...
電話 TEL. NO.: 2158 5841
圖文傳真 FAX NO.: 2685 1155
網址 HOMEPAGE: http://www.epd.gov.hk/

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F., Shatin Government Offices,
1 Sheung Wo Che Road,
Sha Tin, New Territories,
Hong Kong.

環境保護署
環保法規管理科
區域辦事處 (北)
香港新界沙田
上禾輋路一號
沙田政府合署 10 樓

10 November 2014

By fax only: 3922 9797

To: AECOM
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road
Shatin, N.T.
(Attn: Cherry Yau)

Dear Ms Yau,

Agreement No. CE 30/2014(DS)
Relocation of Sha Tin SewageTreatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Request for Information of Chemical Waste Producer and Chemical Spillage Accident

I refer to your letter dated 30 October 2014 on the captioned.

Regarding your enquiries in the above letter, this Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may need to check with other parties / departments for such information as appropriate.

A registry of chemical waste producers is available in the Territory Control Office of this department. Please contact Mr. Dennis Leung, Senior Environmental Protection Inspector at 2835 1027 for making an appointment to view the records.

Should you have any enquiry, you may contact the undersigned.

Yours sincerely,

(CHENG Hing Wai, Henry)
for Director of Environmental Protection

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: EPCW/D2226/753-10
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013188W

13 October 2015

14 OCT 2015
FAXED

By Fax (2685 1133) and Post

Environmental Protection Department
Regional Office (North)
10/F, Sha Tin Government Offices,
1 Sheung Wo Che Road, Sha Tin,
New Territories, Hong Kong

Attn.: Mr. Henry H W Cheng

Dear Sir,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Chemical Waste Producer and Chemical Spillage Accident

We refer to your letter of the above reference dated 10 November 2014 regarding the captioned subject. The letter is attached herewith for your ease of reference.

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us of any reported accidents of spillage/leakage of chemicals within the following Concerned Areas. The Concerned Areas cover the areas as listed in the table and are shown in the **Figure A**.

Concerned Area	Address
Area A	Area adjacent to C&ED's Sha Tin Vehicle Detention Centre covering vacant land, footpaths, cycling tracks, sitting-out area and sections of A Kung Kok Street / Ma On Shan Road / Tate's Cairn Highway (please refer to Figure A for details)
Area B	Footpath, cycling track and vacant land near Kam Tai Court/Hang Tai Road and Chevalier Garden (please refer to Figure A for details)
David Camp	59A A Kung Kok Street, Ma On Shan, Sha Tin
THEES Portal	Located at A Kung Kok Street, near Ah Kung Kok Fishermen Village
Contractor's Work Area (Construction Site Office)	30 Mui Tsz Lam Road, Tai Shui Hang, Sha Tin, N.T.
Nui Po Shan North	Part of the undeveloped Nui Po Shan within the project boundary, located between Mui Tsz Lam Road and A Kung Kok Shan Road

.../2

Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013188W

As per your letter, we will contact the Territory Control Office of your department separately for registry of chemical waste producers within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

本署檔案 OUR REF: EPCW/D2226/753-10
來函檔案 YOUR REF: CYKY:KWGH:ccm:60334056/2.1-20140130188W
電話 TEL. NO.: 2158 5841
圖文傳真 FAX NO.: 2685 1155
網址 HOMEPAGE: http://www.epd.gov.hk/

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F., Shatin Government Offices,
1 Sheung Wo Che Road,
Sha Tin, New Territories,
Hong Kong.

環境保護署
環保法規管理科
區域辦事處 (北)
香港新界沙田
上禾輋路一號
沙田政府合署 10 樓

10 November 2014

By fax only: 3922 9797

To: AECOM
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road
Shatin, N.T.
(Attn: Cherry Yau)

Dear Ms Yau,

Agreement No. CE 30/2014(DS)
Relocation of Sha Tin SewageTreatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Request for Information of Chemical Waste Producer and Chemical Spillage Accident

I refer to your letter dated 30 October 2014 on the captioned.

Regarding your enquiries in the above letter, this Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may need to check with other parties / departments for such information as appropriate.

A registry of chemical waste producers is available in the Territory Control Office of this department. Please contact Mr. Dennis Leung, Senior Environmental Protection Inspector at 2835 1027 for making an appointment to view the records.

Should you have any enquiry, you may contact the undersigned.

Yours sincerely,

(CHENG Hing Wai, Henry)
for Director of Environmental Protection

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

838800 E

840000 E

841200 E

LEGEND:

PROJECT BOUNDARY

N

SHA TIN HOI

830400 N

WSD SALT WATER PUMPING STATION

EXISTING STSTW

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

AREA B

A KUNG KOK STREET

MUI TSZ LAM ROAD

CONTRACTOR'S WORK AREA

DAVID CAMP

THEES PORTAL

829200 N

EXISTING VDC AND ITS SURROUNDING AREA

AREA A

A KUNG KOK

NUI PO SHAN NORTH

SHING MUN RIVER

A KUNG KOK SHAN ROAD

828000 N

SHEK MUN

Plot File by: ZHILZ 2015/10/13
PATH: P:\Projects\60334\560\DRAWING\REPORT\EF\EF_701.dgn

AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

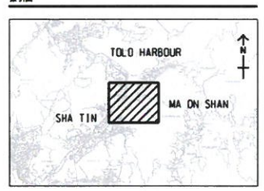
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
狀態

SCALE 比例
A1 1 : 6000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖



PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱
CONCERNED AREAS

SHEET NUMBER
圖紙編號
60334056/EF/FIGURE A

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com

+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (175) in FSD GR 6-5/4 R Pt. 7
Our Ref.: CYKY:TXT:cfwl:60334056/5.1-2015002057W

9 February 2015

By Fax (2367 3631) & Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sirs,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We write further previous letter via ref. CYKY:KWGH:ccm:60334056/2.1-2014013313W dated 30 October 2014 and your kind advice under above mentioned reference dated 14 November 2014 regarding captioned subject.

To facilitate our land contamination assessment within the existing Sha Tin Sewage Treatment Works (the *Concerned Areas)* as shown in enclosed Figure A, we would be much appreciated if you could furnish us with the following information of the Concerned Areas:

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);

- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and

- Fire records within the Concerned Areas.

Should you need further information, please kindly contact the undersigned at 3922 9345 or our Mr. Leo Luk at 3922 9401.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

cc CE/SP, DSD - Attn: Mr. K. H. Chan (w/e)
EA/EPD - Attn: Mr. Laurence Chung (w/e)

Plot File by: LEETHM 24 / 11 /2014
PATH P:\60334056.01\CAD\Drawing\Figure\Land Contamination

Project Management Initials:

Checked: _

ISO A3 297mm X 420mm

KEY PLAN

LEGEND:

CONCERNED AREA

SHA TIN RACECOURSE
PENFOLD PARK
SHATIN KNOLL
SHUI CHONG STREET
TOLO HIGHWAY
SHA TIN SEWAGE TREATMENT WORKS
SHA TIN HOI
SHING MUN RIVER
TATE'S CAIRN HIGHWAY
A KUNG KOK
SHEK MUN
WATER COURSE
KAM TAI COURT
TAI SHUI HANG
CHEVALIER GARDEN
NUI PO SHAN
N

AGREEMENT NO. CE 30/2014 (DS)
RELOCATION OF SHA TIN SEWAGE TREATMENT WORK TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - IDC
Project No.: 60334056 Date: JAN. 2015
Scale: 1 : 8000 (A3)

CONCERNED AREA

AECOM

60334056/CAP/FIGURE A

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (173) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002057W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment within the existing
Sha Tin Sewage Treatment Works
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 9.2.2015 regarding the captioned request and reply below in response to your questions seriatim:-

1. Dangerous goods approval has been granted in respect of the captioned address. Please refer to **Appendix A** for details.

2. No record of incidents of spillage / leakage of dangerous goods was found at the aforesaid location with your given conditions.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

Appendix A

Land Contamination Assessment within the existing
Sha Tin Sewage Treatment Works
Request for Information of Dangerous Goods & Incident Records

Item	Types	Quantity	Storage Method
1.	Sodium Hydroxide Solution	9,200 Litres	Above ground tank
2.	i) Sodium Hydroxide Solution	2,950 Litres	Above ground tank
	ii) Sodium Hypochlorite Solution	1,130 Litres	Above ground tank
3.	Sodium Hydroxide Solution	9,200 Litres	Above ground tank
4.	Sodium Hydroxide Solution	3,620 Litres	Above ground tank
5.	Sodium Hypochlorite.Solution	2 nos of $12m^3$	Above ground tank
6.	Sodium Hypochlorite Solution	2 nos of $12m^3$	Above ground tank
7.	Sodium Hypochlorite Solution	2 nos of $12m^3$	Above ground tank
8.	Sodium Hypochlorite Solution	2 nos of $12m^3$	Above ground tank
9.	Sodium Hypochlorite Solution	2 nos of $12m^3$	Above ground tank
10.	Sodium Hydroxide Solution	10,000 Litres	Above ground tank
11.	Sodium Hypochlorite Solution	2 nos of $7.85m^3$	Above ground tank
12.	Diesel	1,000 Litres	Above ground tank
13.	i) Acetylene	2 nos of $11.2m^3$ cylinders	Approved gas cylinder
	ii) Hydrogen	2 nos of $6.2m^3$ cylinders	Approved gas cylinder
14.	i) Compressed Air	2 nos of $6.8m^3$ cylinders	Approved gas cylinder
	ii) Argon	6 nos of $6.8m^3$ cylinders	Approved gas cylinder

	iii) Helium	2 nos of 6.2m^3 cylinders	Approved gas cylinder
	iv) Nitrogen	2 nos of 6.2m^3 cylinders	Approved gas cylinder
	v) Oxygen	2 nos of 6.8m^3 cylinders	Approved gas cylinder
	vi) Carbon Dioxide	2 nos of 22.7kg cylinders	Approved gas cylinder
	vii) Nitrous Oxide	2 nos of 27kg cylinders	Approved gas cylinder
15.	i) Hydrochloric Acid	30 Litres	Inside a 2.5-litre container
	ii) Sulphuric Acid	20 Litres	Inside a 2.5-litre container
16.	i) Phosphoric Acid	1,000 Litres	Inside a 2.5-litre container
	ii) Nitric Acid	20 Litres	Inside a 2.5-litre container
17.	i) Sodium Hydroxide Soultion	100 Litres	Inside a 2.5-litre container
	ii) Sodium Hydroxide	100 kg	Inside a 1-kg container

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (175) in FSD GR 6-5/4 R Pt. 7
Our Ref.: CYKY:TXT:cfwl:60334056/5.1-2015002056W

9 February 2015

By Fax (2367 3631) & Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sirs,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We write further to our previous letter via ref. CYKY:KWGH:ccm:60334056/2.1-2014013313W dated 30 October 2014 and your kind advice under above mentioned reference dated 14 November 2014 regarding captioned subject.

To facilitate our land contamination assessment within the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC) including its adjoining area as highlighted in green as shown in enclosed Figure B, we would be much appreciated if you could furnish us with the following information related to the Concerned Areas:

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);

- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and

- Fire records within the Concerned Areas.

Should you need further information, please kindly contact the undersigned at 3922 9345 or our Mr. Leo Luk at 3922 9401.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

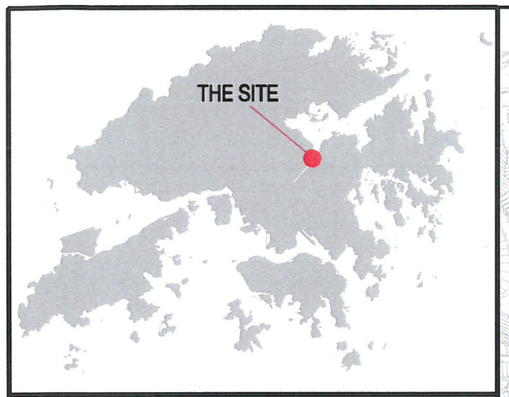
Encl.

cc CE/SP, DSD - Attn: Mr. K. H. Chan (w/e)
EA/EPD - Attn: Mr. Laurence Chung (w/e)

ISO A3 297mm X 420mm

Checked: —

Project Management Initials:



KEY PLAN

SHATIN KNOLL

SHA TIN HOI

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE (VDC)

KAM TAI COURT

WATER COURSE

TAI SHUI HANG

SHUI CHONG STREET

TOLO HIGHWAY

CHEVALIER GARDEN

SHA TIN RACECOURSE

PENFOLD PARK

SHING MUN RIVER

TATE'S CAIRN HIGHWAY

ADJOINING AREAS TO VDC

A KUNG KOK

SHEK MUN

NUI PO SHAN

N

LEGEND:

CONCERNED AREA

CONCERNED AREA

AECOM

60334056/CAP/FIGURE B

AGREEMENT NO. CE 30/2014 (DS)
RELOCATION OF SHA TIN SEWAGE TREATMENT WORK TO CAVERNS:
CAVERNS AND SEWAGE TREATMENT WORKS - IDC
Project No.: 60334056 Date: JAN. 2015
Scale: 1 : 8000 (A3)

Plot File by: LEETHM 24 / 11 /2014
PATH P:\60334056.01\CAD\Drawing\Figure\Land Contamination

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 **OUR REF.** : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 **YOUR REF.** : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 **E-mail** : hkfsdenq@hkfsd.gov.hk
圖文傳真 **FAX NO.** : 2739 5879
電 話 **TEL NO.** : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (172) in FSD GR 6-5/4 R Pt. 8
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013189W

13 October 2015

15 OCT 2015
FAXED

By Fax (2367 3631) and Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We refer to your letter of the above reference dated 24 February 2015 regarding the captioned subject (the copy of letter is enclosed for your ease of reference).

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment. The Concerned Areas (Area A and B) cover the following areas and area shown in the **Figure A**:

1) Area A – The area adjacent to C&ED's Sha Tin Vehicle Detention Centre covering vacant land, footpaths, cycling tracks, sitting-out area and sections of A Kung Kok Street/ Ma On Shan Road/ Tate's Cairn Highway; and

2) Area B – Footpath, cycling track and vacant land near Kam Tai Court/ Hang Tai Road and Chevalier Garden.

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and license no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and
- Fire records within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services

LEGEND:

PROJECT BOUNDARY

838800 E

840000 E

841200 E

N

SHA TIN HOI

830400 N

829200 N

828000 N

WSD SALT WATER PUMPING STATION

EXISTING STSTW

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

AREA B

A KUNG KOK STREET

MUI TSZ LAM ROAD

CONTRACTOR'S WORK AREA

DAVID CAMP

THEES PORTAL

EXISTING VDC AND ITS SURROUNDING AREA

AREA A

NUI PO SHAN NORTH

SHING MUN RIVER

A KUNG KOK SHAN ROAD

SHEK MUN

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: ZHLZ 2015/10/13
PATH: P:\projects\60334056\DRAWING\REPORT\EF\EF 701.dgn

AECOM

PROJECT

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT

渠務署
Drainage Services Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

RR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 6000

DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60334056

CONTRACT NO.: CE 30/2014 (DS)

SHEET TITLE

CONCERNED AREAS

SHEET NUMBER

60334056/EF/FIGURE A

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (190) in FSD GR 6-5/4 R Pt. 10
來函檔號 YOUR REF. : CYKY:TXT:kchy:60334056/5.1-2015013189W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

13 November 2015

AECOM Asia Co. Ltd
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Area A: ***C & ED's Sha Tin Vehicle Detention Centre and Sections of A Kung Kok Street/ Ma On Shan Road/ Tate's Cairn Highway***
Area B: ***Near Kam Tai Court/ Hang Tai Road and Chevalier Garden***
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 13.10.2015 regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(LEE Kui-hung)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

AECOM
AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (172) in FSD GR 6-5/4 R Pt. 8
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013193W

13 October 2015

15 OCT 2015
FAXED

By Fax (2367 3631) and Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We refer to your letter of the above reference dated 24 February 2015 regarding the captioned subject (the copy of letter is enclosed for your ease of reference).

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment. The Concerned Area (Contractor's Work Area) is located at 30 Mui Tsz Lam Road, Tai Shui Hang, Sha Tin, N.T. and is shown in enclosed **Figure A**.

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and
- Fire records within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

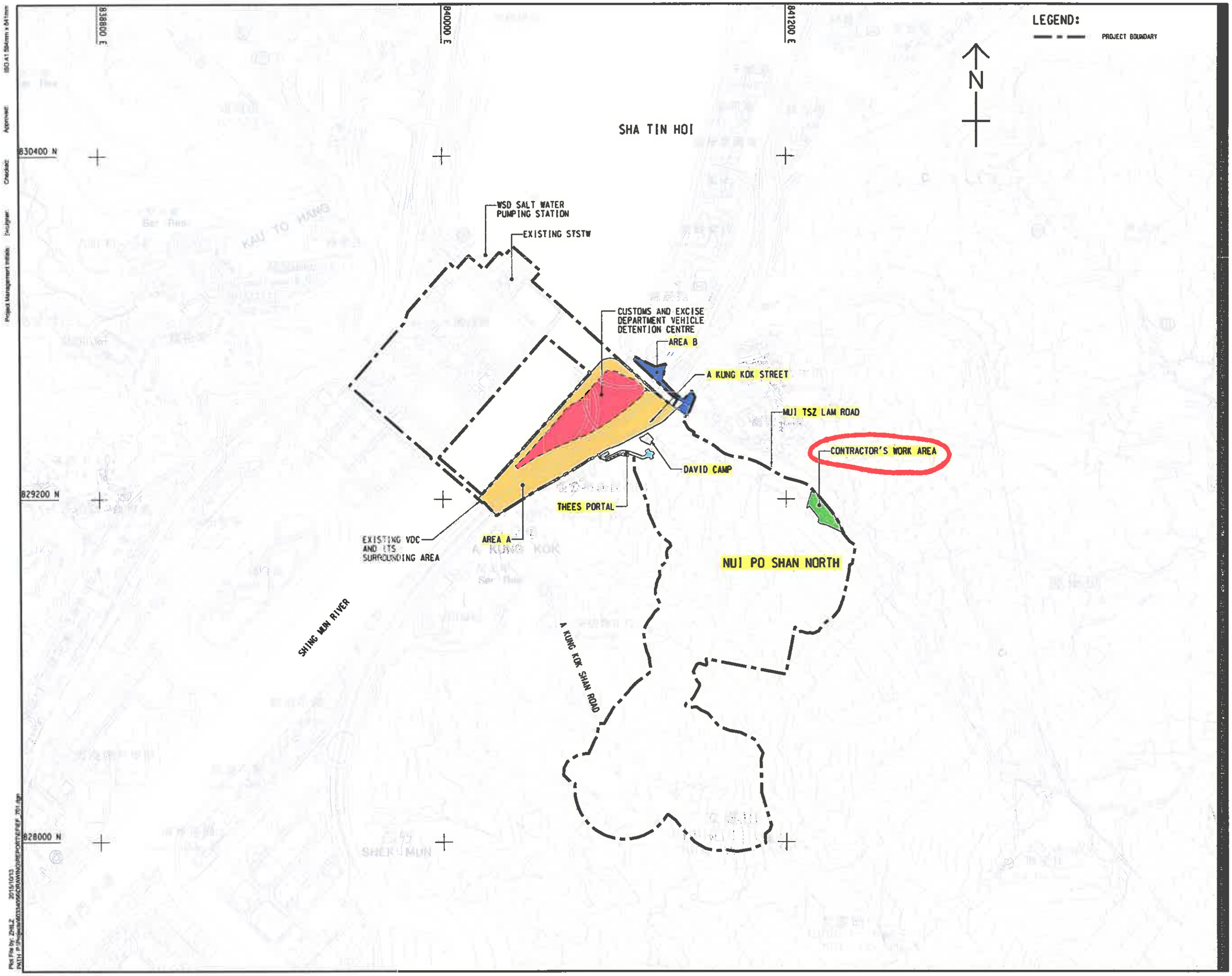
I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services



AECOM

PROJECT

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT

渠務署
Drainage Services Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

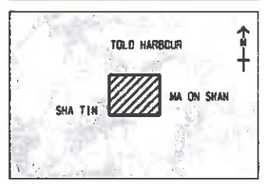
I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE A1 1 : 6000

DIMENSION UNIT METRES

KEY PLAN



PROJECT NO. 60334056

CONTRACT NO. CE 30/2014 (DS)

SHEET TITLE

CONCERNED AREAS

SHEET NUMBER

60334056/EF/FIGURE A

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (188) in FSD GR 6-5/4 R Pt. 10
來函檔號 YOUR REF. : CYKY:TXT:kchy:60334056/5.1-2015013193W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

13 November 2015

AECOM Asia Co. Ltd
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
(Contractor's Work Area, located at 30 Mui Tsz Lam Road, Tai Shui Hang, Sha Tin, NT)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 13.10.2015 regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(LEE Kui-hung)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (172) in FSD GR 6-5/4 R Pt. 8
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013190W

15 OCT 2015
FAXED

13 October 2015

By Fax (2367 3631) and Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We refer to your letter of the above reference dated 24 February 2015 regarding the captioned subject (the copy of letter is enclosed for your ease of reference).

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment. The Concerned Area (David Camp) is located at 59A A Kung Kok Street, Ma On Shan, Sha Tin and is shown in enclosed **Figure A**.

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and
- Fire records within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please **kindly** contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

838800 E

840000 E

841200 E

LEGEND:

PROJECT BOUNDARY

N

SHA TIN HOI

830400 N

KAU TO HANG

WSD SALT WATER PUMPING STATION

EXISTING STSTW

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

AREA B

A KUNG KOK STREET

MUI TSZ LAM ROAD

CONTRACTOR'S WORK AREA

DAVID CAMP

THEES PORTAL

829200 N

EXISTING VDC AND ITS SURROUNDING AREA

AREA A

A KUNG KOK

NUI PO SHAN NORTH

SHING MUN RIVER

A KUNG KOK SHAN ROAD

828000 N

SHEK MUN

Plot File by: ZHLZ 2015/10/13

PATH: P:\Projects\60334056\DRAWINGS\REPORT\EIEF_701.dgn

AECOM

PROJECT

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT

渠務署
Drainage Services Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

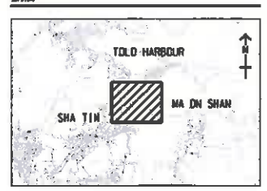
ISSUE/REVISION

IR	DATE	DESCRIPTION	CHK

STATUS

SCALE	DIMENSION UNIT
A1 1 : 6000	METRES

KEY PLAN



PROJECT NO.	CONTRACT NO.
60334056	CE 30/2014 (DS)

SHEET TITLE

CONCERNED AREAS

SHEET NUMBER

60334056/EF/FIGURE A

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (192) in FSD GR 6-5/4 R Pt. 10
來函檔號 YOUR REF. : CYKY:TXT:kchy:60334056/5.1-2015013191W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

13 November 2015

AECOM Asia Co. Ltd
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
(undeveloped area of Nui Po Shan, located between A Kung Kok Shan Road and Mui Tsz Lam Road)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 13.10.2015 regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(LEE Kui-hung)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (172) in FSD GR 6-5/4 R Pt. 8
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013192W

13 October 2015

FAXED 13 OCT 2015

By Fax (2367 3631) and Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We refer to your letter of the above reference dated 24 February 2015 regarding the captioned subject (the copy of letter is enclosed for your ease of reference).

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment. The Concerned Area (THEES Portal) is located at A Kung Kok Street and is shown in enclosed **Figure A**.

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and
- Fire records within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

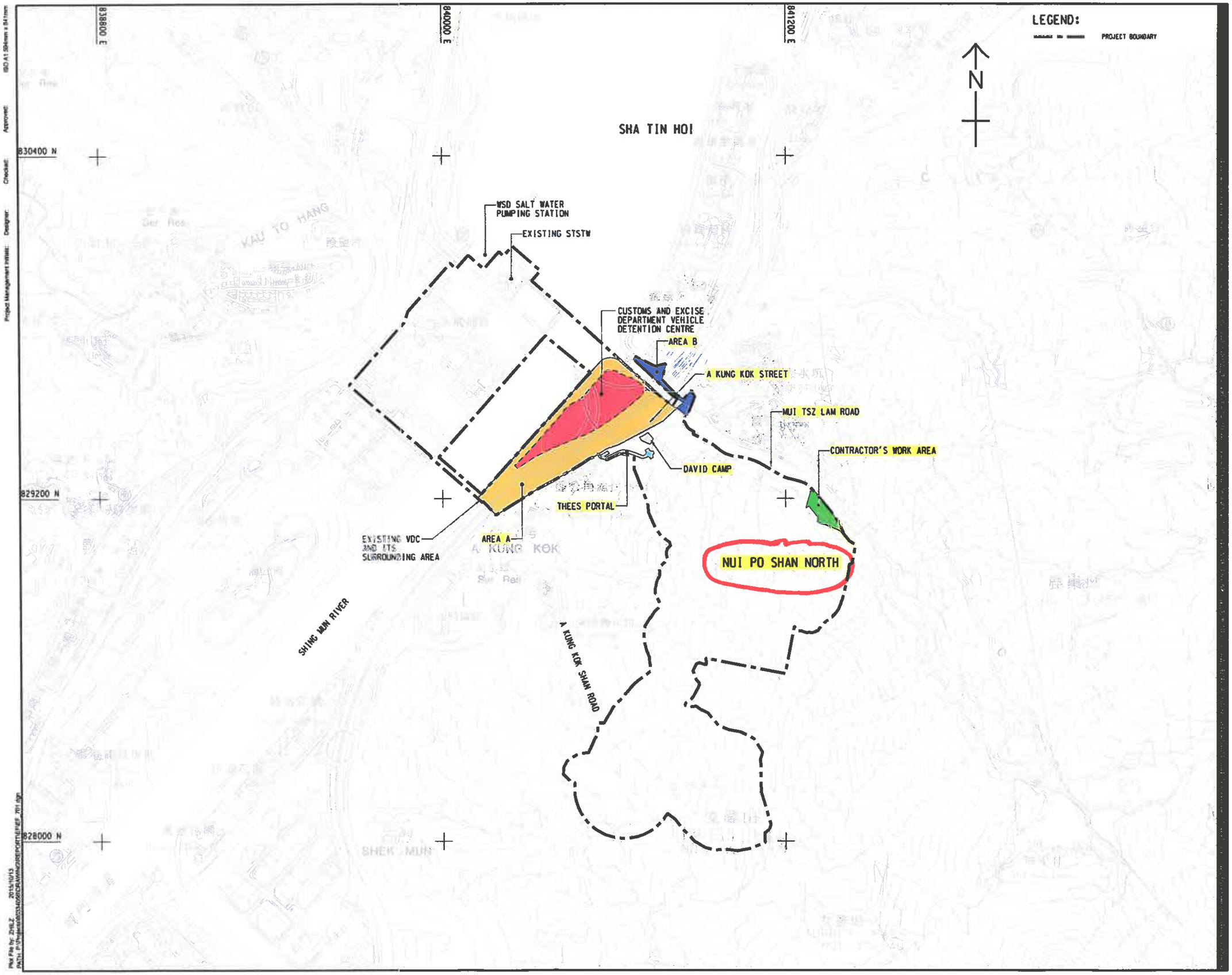
I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services



AECOM

PROJECT
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
渠務署
Drainage Services Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

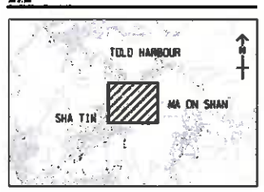
ISS.	DATE	DESCRIPTION	CHK.

STATUS

SCALE
A1 1 : 8000

DIMENSION UNIT
METRES

KEY PLAN



PROJECT NO.
60334056

CONTRACT NO.
CE 30/2014 (DS)

SHEET TITLE
CONCERNED AREAS

SHEET NUMBER
60334056/EF/FIGURE A

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:
Plot File by: ZHLZ 2015/V13
PATH: P:\Projects\60334056\ENVIRONMENTAL\REPORT\EIA\EF_701.dgn

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (192) in FSD GR 6-5/4 R Pt. 10
來函檔號 YOUR REF. : CYKY:TXT:kchy:60334056/5.1-2015013191W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

13 November 2015

AECOM Asia Co. Ltd
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
(undeveloped area of Nui Po Shan, located between A Kung Kok Shan Road and Mui Tsz Lam Road)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 13.10.2015 regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(LEE Kui-hung)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
凡 提 及 本 信 時 請 引 述 編 號 及 日 期

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: (172) in FSD GR 6-5/4 R Pt. 8
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013192W

13 October 2015

FAXED 13 OCT 2015

By Fax (2367 3631) and Post

Fire Services Department
Licensing and Certification Command
5/F, South Wing, Fire Services Headquarters Building,
1 Hong Chong Road,
Kowloon, Hong Kong

Dear Sir / Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record

We refer to your letter of the above reference dated 24 February 2015 regarding the captioned subject (the copy of letter is enclosed for your ease of reference).

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us with the following information of the Concerned Areas for our assessment. The Concerned Area (THEES Portal) is located at A Kung Kok Street and is shown in enclosed **Figure A**.

- Current and past registered Dangerous Goods storage within the Concerned Areas (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Concerned Areas; and
- Fire records within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (172) in FSD GR 6-5/4 R Pt. 8
來函檔號 YOUR REF. : CYKY :TXT :cfwl :60334056/5.1-2015002056W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

24 February 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Land Contamination Assessment with the Custom and Excise Department's Sha Tin Vehicle Detention Centre (VDC)
Request for Information of Dangerous Goods & Incident Records

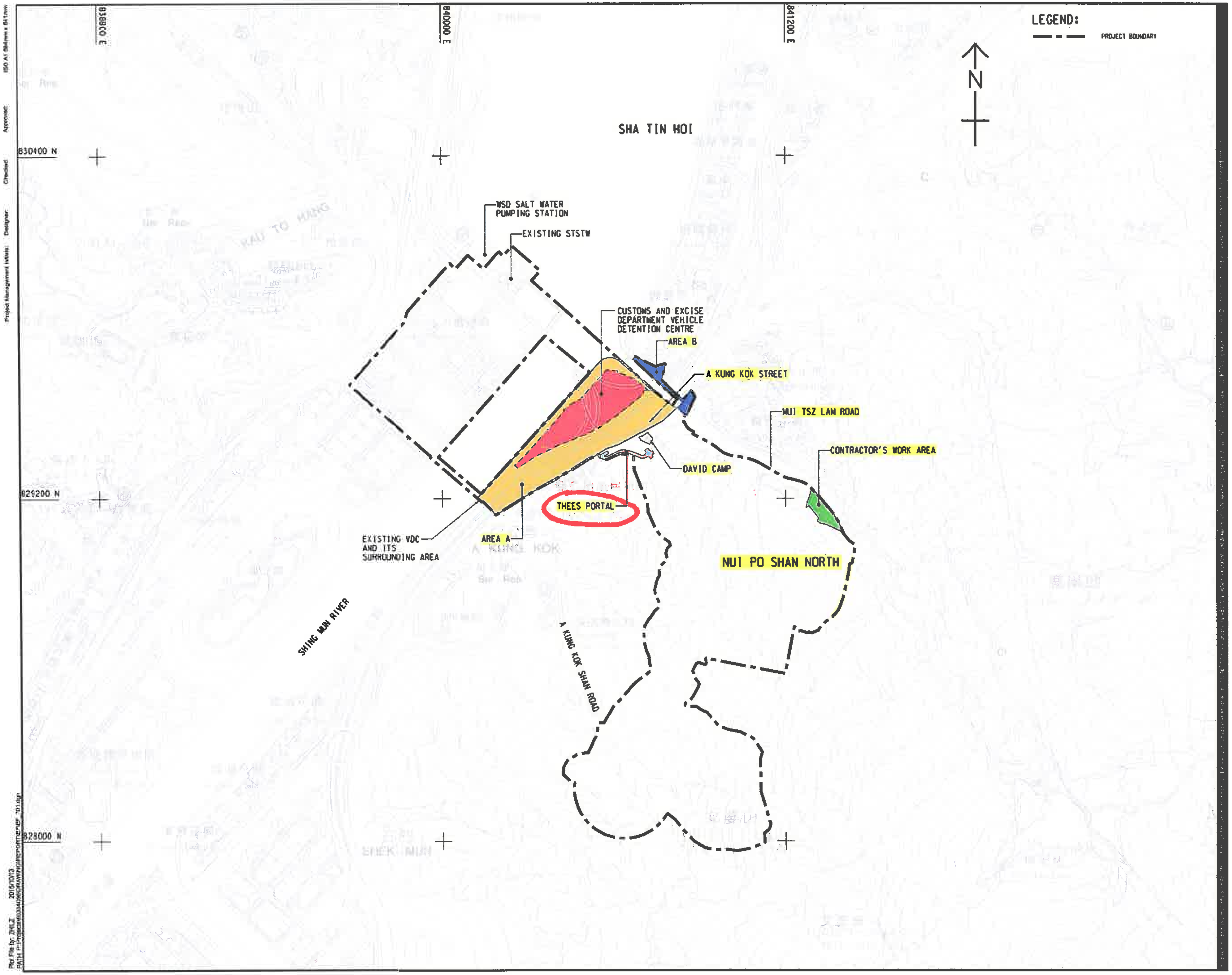
I refer to your letter regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)
for Director of Fire Services



AECOM

PROJECT

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT

渠務署 Drainage Services Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 6000

DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60334056

CONTRACT NO.: CE 30/2014 (DS)

SHEET TITLE: CONCERNED AREAS

SHEET NUMBER: 60334056/EF/FIGURE A

消 防 處
香港九龍尖沙咀東部廣華道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (191) in FSD GR 6-5/4 R Pt. 10
來函檔號 YOUR REF. : CYKY:TXT:kchy:60334056/5.1-2015013192W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

13 November 2015

AECOM Asia Co. Ltd
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Ms. Cherry YAU, Technical Director)

Dear Ms. YAU,

Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
(Thees Portal, located at A Kung Kok Street)
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 13.10.2015 regarding the captioned subject.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(LEE Kui-hung)
for Director of Fire Services

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Your Ref.: EPCW/D2226/753-10
Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013188W

13 October 2015

14 OCT 2015
FAXED

By Fax (2685 1133) and Post

Environmental Protection Department
Regional Office (North)
10/F, Sha Tin Government Offices,
1 Sheung Wo Che Road, Sha Tin,
New Territories, Hong Kong

Attn.: Mr. Henry H W Cheng

Dear Sir,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Request for Information of Chemical Waste Producer and Chemical Spillage Accident

We refer to your letter of the above reference dated 10 November 2014 regarding the captioned subject. The letter is attached herewith for your ease of reference.

To facilitate our land contamination assessment under this Agreement, we would be much appreciated if you could furnish us of any reported accidents of spillage/leakage of chemicals within the following Concerned Areas. The Concerned Areas cover the areas as listed in the table and are shown in the **Figure A**.

Concerned Area	Address
Area A	Area adjacent to C&ED's Sha Tin Vehicle Detention Centre covering vacant land, footpaths, cycling tracks, sitting-out area and sections of A Kung Kok Street / Ma On Shan Road / Tate's Cairn Highway (please refer to Figure A for details)
Area B	Footpath, cycling track and vacant land near Kam Tai Court/Hang Tai Road and Chevalier Garden (please refer to Figure A for details)
David Camp	59A A Kung Kok Street, Ma On Shan, Sha Tin
THEES Portal	Located at A Kung Kok Street, near Ah Kung Kok Fishermen Village
Contractor's Work Area (Construction Site Office)	30 Mui Tsz Lam Road, Tai Shui Hang, Sha Tin, N.T.
Nui Po Shan North	Part of the undeveloped Nui Po Shan within the project boundary, located between Mui Tsz Lam Road and A Kung Kok Shan Road

.../2

Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013188W

As per your letter, we will contact the Territory Control Office of your department separately for registry of chemical waste producers within the Concerned Areas.

We would be grateful to have your reply on or before 27 October 2015. Should you need further information, please kindly contact the undersigned at 3922 8345 or our Mr. Kelvin Chiang at 3922 9507.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

本署檔案 OUR REF: EPCW/D2226/753-10
來函檔案 YOUR REF: CYKY:KWGH:ccm:60334056/2.1-20140130188W
電話 TEL. NO.: 2158 5841
圖文傳真 FAX NO.: 2685 1155
網址 HOMEPAGE: http://www.epd.gov.hk/

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F., Shatin Government Offices,
1 Sheung Wo Che Road,
Sha Tin, New Territories,
Hong Kong.

環境保護署
環保法規管理科
區域辦事處 (北)
香港新界沙田
上禾輋路一號
沙田政府合署 10 樓

10 November 2014

By fax only: 3922 9797

To: AECOM
8/F Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road
Shatin, N.T.
(Attn: Cherry Yau)

Dear Ms Yau,

Agreement No. CE 30/2014(DS)
Relocation of Sha Tin SewageTreatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction
Request for Information of Chemical Waste Producer and Chemical Spillage Accident

I refer to your letter dated 30 October 2014 on the captioned.

Regarding your enquiries in the above letter, this Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may need to check with other parties / departments for such information as appropriate.

A registry of chemical waste producers is available in the Territory Control Office of this department. Please contact Mr. Dennis Leung, Senior Environmental Protection Inspector at 2835 1027 for making an appointment to view the records.

Should you have any enquiry, you may contact the undersigned.

Yours sincerely,

(CHENG Hing Wai, Henry)
for Director of Environmental Protection

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

838800 E

840000 E

841200 E

LEGEND:

PROJECT BOUNDARY

N

SHA TIN HOI

830400 N

WSD SALT WATER PUMPING STATION

EXISTING STSTW

CUSTOMS AND EXCISE DEPARTMENT VEHICLE DETENTION CENTRE

AREA B

A KUNG KOK STREET

MUI TSZ LAM ROAD

CONTRACTOR'S WORK AREA

DAVID CAMP

THEES PORTAL

829200 N

EXISTING VDC AND ITS SURROUNDING AREA

AREA A

A KUNG KOK

NUI PO SHAN NORTH

SHING MUN RIVER

A KUNG KOK SHAN ROAD

828000 N

SHEK MUN

Plot File by: ZHILZ 2015/10/13
PATH: P:\Projects\60334\560\DRAWING\REPORT\EF\EF_701.dgn

AECOM

PROJECT
項目

RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

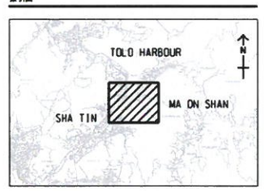
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
狀態

SCALE 比例
A1 1 : 6000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖



PROJECT NO. 項目編號
60334056

CONTRACT NO. 合約編號
CE 30/2014 (DS)

SHEET TITLE
圖紙名稱
CONCERNED AREAS

SHEET NUMBER
圖紙編號
60334056/EF/FIGURE A

Chiang, Tsun Yat Kelvin

From: hcheng@epd.gov.hk
Sent: Wednesday, January 13, 2016 4:59 PM
To: Xie, Ting Tina
Cc: Yau, King Yee Cherry; Chiang, Tsun Yat Kelvin; Lee, King Hei Kenneth; kiehshengty@dsd.gov.hk; Tso, Shiu Heng Lawrence
Subject: Re: FW: Agreement No. CE 30/2014 (DS) - Request for Information of Chemical Waste Producer and Chemical Spillage Accident
Attachments: 2015013188W.pdf

Dear Tina,

This Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may need to check with other parties / departments for such information as appropriate.

Henry CHENG
EPD

"Xie, Ting Tina" <tina.xie@aecom.com>

13/01/2016 16:44

To "hcheng@epd.gov.hk" <hcheng@epd.gov.hk>
cc "kiehshengty@dsd.gov.hk" <kiehshengty@dsd.gov.hk>, "Yau, King Yee Cherry" <cherry.yau@aecom.com>, "Tso, Shiu Heng Lawrence" <lawrence.tso@aecom.com>, "Chiang, Tsun Yat Kelvin" <Kelvin.Chiang@aecom.com>, "Lee, King Hei Kenneth" <Kenneth.KH.Lee@aecom.com>
Subject FW: Agreement No. CE 30/2014 (DS) - Request for Information of Chemical Waste Producer and Chemical Spillage Accident

Dear Mr. Cheng,

Further to our email below and phone conversation last month, we have already visited the Territory Control Office of your department for the registry of chemical waste producers within the Concerned Areas (Area A, Area B, David Camp, THEES Portal, Contractor's Works Area and Nui Po Shan North as shown in attached Figure A).

As part of the land contamination assessment under this Agreement, we still need the record of reported accidents of spillage/leakage of chemicals within the concerned areas, if any, from your office. We would be much grateful if you could furnish us of any record for our study on or before 19 January 2016. Many thanks.

Regards,
Tina

From: Xie, Ting Tina
Sent: Friday, November 27, 2015 3:30 PM
To: 'hcheng@epd.gov.hk'
Cc: kiehshengty@dsd.gov.hk; Yau, King Yee Cherry; Tso, Shiu Heng Lawrence; Chiang, Tsun Yat Kelvin; Lee, King Hei Kenneth
Subject: Agreement No. CE 30/2014 (DS) - Request for Information of Chemical Waste Producer and Chemical Spillage Accident

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Request for Information of Chemical Waste Producer and Chemical Spillage Accident

Dear Mr. Cheng,

Further to our letter ref. CYKY:TXT:kchy:60334056/5.1-2015013188W dated 13 October 2015 regarding the captioned subject, it is found that we have not received your reply yet. The relevant letter is attached for your easy of reference. We would be grateful to have your replies, if any, at your earliest convenience.

Should you have any queries, please feel free to contact me. Thanks.

Regards,
Tina Xie
ENGINEER, MEng, MICE
D +852 3922 8334
tina.xie@aecom.com
AECOM
13/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, New Territories, Hong Kong
T: +852 3922 8334 F +852 3922 9797
www.aecom.com

CAP Appendix 2.05

Replies from Customs and Excise Department

[BLANK]

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com

+852 3922 9000 tel
+852 3922 9797 fax

Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013123W

12 October 2015

12 OCT 2015
FAXED

By Hand & Fax (2854 3987)

Customs and Excise Department
Administration and Human Resource
Development Branch (AD Branch)
29/F, Customs Headquarters Building,
222 Java Road, North Point, Hong Kong

Attn.: Ms. Fanny Chan

Dear Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Contamination Assessment Plan – Request for Information on Sha Tin Vehicle Detention Centre (STVDC)

We refer to our letter ref. RCYK:CYKY:TXT:KLKH:kchy:60334056/5.1-2015010861W dated 27 August 2015 regarding the submission of captioned Contamination Assessment Plan (CAP).

Following to the above referred letter, we have received comments from Environmental Protection Department (EPD) relating to the potential land contamination concerns within the Sha Tin Vehicle Detention Centre (STVDC). The relevant EPD's comment is extracted below for your reference:

"According to Photo No. B5 in Appendix 2.03b showing the seized goods, it appears that some containers for "chemicals" were stored in open area without proper containment so that any chemicals/residues inside these containers might have the potential for causing land contamination. Please obtain written correspondence from C&ED that (i) "only" emptied containers were stored and (ii) any seized goods of containers with chemicals, fuel, oil, etc. would be "emptied" and completely "cleaned up" off-site to ensure that there are no residues of chemicals/fuel/oil inside these emptied containers before their storage in the Sha Tin Vehicle Detention Centre."

From the above, we would be grateful if you could, if appropriate, provide a written confirmation for the above underlined statement. Photo No. B5 in Appendix 2.03b of the CAP is enclosed herewith for your ease of reference.

Your assistance in this matter will be greatly appreciated. Should you have any queries, please feel free to contact the undersigned at 3922 9345 or email via cherry.yau@aecom.com.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

Lee, King Hei Kenneth

From: fanny_lf_chan@customs.gov.hk
Sent: Wednesday, October 14, 2015 11:14 AM
To: Yau, King Yee Cherry
Cc: hskan@dsd.gov.hk; kiehshengty@dsd.gov.hk; Xie, Ting Tina; candy_fk_ng@customs.gov.hk; alan_sl_wong@customs.gov.hk; ricky_kh_chow@customs.gov.hk; alice_wf_chan@customs.gov.hk
Subject: Re: Reminder: CE 30/2014 - Contamination Assessment Plan
Attachments: 2015010861W.pdf; Chemical Wastes Producers-pdf.zip

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Ms. YAU,

I refer to your letters under reference CYKY:TXT:kchy:60334056/5.1-2015013123W dd. 27 August 2015 and 12 October 2015 in respect of the above subject and would like to provide our comments as below:

i) Re. Letter dd. 27 August 2015
Referring to Para.2.5.1.2 of the report, please note that the VDC of C&ED has the chemical producer records for used empty vehicle batteries. Copy of the record is attached.

ii) Re. Letter dd. 12 October 2015
For the containers as mentioned in the photo no. B5 in Appendix 2.03b of the above mentioned Report, I would like to clarify that only empty containers would be temporarily stored in the VDC.

Please feel free to contact me or Mr. Alan Wong at tel. 3759 3941 if you have any enquiry.

Regards
Ms CHAN Lai-fan
CSO(C&ED)
Tel. 3759 3937

From: kiehshengty@dsd.gov.hk
To: alice_wf_chan@customs.gov.hk, chlau@pland.gov.hk, fanny_lf_chan@customs.gov.hk,
Cc: cherry.yau@aecom.com, hskan@dsd.gov.hk, tina.xie@aecom.com
Date: 12/10/2015 11:04
Subject: Reminder: CE 30/2014 - Contamination Assessment Plan

Dear All,

This serves as a gentle reminder. I will be appreciated if you could provide your reply letter to AECOM with copy to CE/SP on or before 15 Oct 2015.
Thanks!

Raymond Ty
(2594 7451)

Attachment

Environmental Protection Department
環 境 保 護 署

Waste Disposal Ordinance (Chapter 354)
香港法例第354章廢物處置條例
Waste Disposal (Chemical Waste)(General) Regulation
廢物處置(化學廢物)(一般)規例

Registration of Waste Producer
廢物產生者登記證

To: 致

Waste Producer 廢物產生者

Full Name (English) 全 名 (英 文): Commissioner of Customs and Excise

(Chinese) (中 文): 海關關長 **I.D. Card No. (if any) 身份證號碼 :(如有者):** ---

Business Reg. Cert. No. (if any) 商業登記證號碼 : (如有者): ---

Address for Correspondence 通訊地址: Supplies Section, 29/F., Customs Headquarters Building, 222 Java Road, North Point, H.K.

Tel. No. 電 話: 3759 3941 **Fax No. 圖文傳真 :** 2854 3987

With reference to your application dated 05 / 10 / 2012 **for registration as a Waste Producer under the Waste Disposal (Chemical Waste) (General) Regulation, the Waste Producer Number, WPN** 0|0|1|2–7|5|6–C|3|7|6|0–0|1 **is assigned to you in respect of the location or premises listed below:—**

前於 2012 **年** 10 **月** 05 **日 根據廢物處置(化學廢物)(一般)規例而來信，申請登記爲廢物產生者，茲特配予廢物產生者編號第** 0|0|1|2–7|5|6–C|3|7|6|0–0|1 **號，予下開地點或樓宇: —**

Location or Premises where the waste is produced 產生廢物的地點或樓宇

Name of Establishment 機構名稱: Customs and Excise Department

Business Reg. Cert. No. (if any) 商業登記證號碼: (如有者): ---

Nature of Business 業務性質: --

Major chemical waste types 主要化學廢物種類: Spent battery

Address 地址: 39 Hang Tai Road, Tai Shui Hang, Shatin, N.T.

Tel. No. 電話: 2647 1895 **Fax No. 圖文傳真:** 2707 4026

Contact Person (Full Name) 聯絡人: (全名) Mr. LAI Mau-yee **(Capacity) (職位)** Supplies Supervisor I

ENVIRONMENTAL PROTECTION DEPARTMENT HONG KONG 環境保護署

(CHENG Hing-wai, Henry)
for *Director of Environmental Protection*
環境保護署署長 (鄭慶偉 代行)

Date 日期 9/10/2012

WARNING : Any registered waste producer who fails to inform the Director of Environmental Protection of any change in his registration particulars commits an offence and is liable on conviction to a fine of $10,000.
警 告 : 任何已登記的廢物產生者，若其登記資料有任何改變而不知會環境保護署署長，即屬違法，被定罪者最高罰款港幣10,000元。

EPD 130

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com
+852 3922 9000 tel
+852 3922 9797 fax

Our Ref.: CYKY:TXT:KLKH:kchy:60334056/5.1-2015013850W

27 October 2015

By Hand & Fax (2854 3987)

28 OCT 2015 FAXED

Customs and Excise Department
Administration and Human Resource
Development Branch (AD Branch)
29/F, Customs Headquarters Building,
222 Java Road, North Point, Hong Kong

Attn.: Ms. Fanny Chan

Dear Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Contamination Assessment Plan – Request for Information on Sha Tin Vehicle Detention Centre (STVDC)

We write further to our previous letter under ref.CYKY:TXT:kchy:60334056/5.1-2015013123W dated 12 October 2015 for captioned subject and your responses via email dated 14 October 2015 (a copy of relevant correspondences is enclosed for your easy of reference).

As per your responses via email, it was noted that the spent batteries were produced from STVDC. In this connection, we would be grateful if you could furnish us with more information as below:

1. The handling process (storage/collection/transportation/disposal) of spent batteries once they were produced within STVDC;
2. The existing/pervious/temporary storage area(s) provided for the spent batteries within STVDC, and
   - the secondary containment provided for the area(s) (e.g. bund walls and floors), if any.
   - the relevant records describing the condition and location of the storage areas.
3. The past record of battery leakage within STVDC, if any;
4. The licensed chemical waste collector hired for collection and delivery of the spent batteries from STVDC; and
5. Please confirm if the vehicle batteries were emptied before entering STVDC and free from battery solution.

Your assistance in this matter will be greatly appreciated. Should you have any queries, please feel free to contact the undersigned at 3922 9345 or email via cherry.yau@aecom.com.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

cc CE/SP, DSD – Attn.: Mr. S. K. Wong (w/e)

Enclosure : Relevant Correspondence

Xie, Ting Tina

From: fanny_lf_chan@customs.gov.hk
Sent: Wednesday, October 14, 2015 11:14 AM
To: Yau, King Yee Cherry
Cc: hskan@dsd.gov.hk; kiehshengty@dsd.gov.hk; Xie, Ting Tina; candy_fk_ng@customs.gov.hk; alan_sl_wong@customs.gov.hk; ricky_kh_chow@customs.gov.hk; alice_wf_chan@customs.gov.hk
Subject: Re: Reminder: CE 30/2014 - Contamination Assessment Plan
Attachments: 2015010861W.pdf; Chemical Wastes Producers-pdf.zip

Follow Up Flag: Follow up
Flag Status: Completed

Dear Ms. YAU,

I refer to your letters under reference CYKY:TXT:kchy:60334056/5.1-2015013123W dd. 27 August 2015 and 12 October 2015 in respect of the above subject and would like to provide our comments as below:

i) Re. Letter dd. 27 August 2015
Referring to Para.2.5.1.2 of the report, please note that the VDC of C&ED has the chemical producer records for used empty vehicle batteries. Copy of the record is attached.

ii) Re. Letter dd. 12 October 2015
For the containers as mentioned in the photo no. B5 in Appendix 2.03b of the above mentioned Report, I would like to clarify that only empty containers would be temporarily stored in the VDC.

Please feel free to contact me or Mr. Alan Wong at tel. 3759 3941 if you have any enquiry.

Regards
Ms CHAN Lai-fan
CSO(C&ED)
Tel. 3759 3937

From: kiehshengty@dsd.gov.hk
To: alice_wf_chan@customs.gov.hk, chlau@pland.gov.hk, fanny_lf_chan@customs.gov.hk,
Cc: cherry.yau@aecom.com, hskan@dsd.gov.hk, tina.xie@aecom.com
Date: 12/10/2015 11:04
Subject: Reminder: CE 30/2014 - Contamination Assessment Plan

Dear All,

This serves as a gentle reminder. I will be appreciated if you could provide your reply letter to AECOM with copy to CE/SP on or before 15 Oct 2015.
Thanks!

Raymond Ty
(2594 7451)
SPD, DSD

Environmental Protection Department
環 境 保 護 署

Waste Disposal Ordinance (Chapter 354)
香港法例第354章廢物處置條例
Waste Disposal (Chemical Waste)(General) Regulation
廢物處置(化學廢物)(一般)規例
Registration of Waste Producer
廢物產生者登記證

To: 致

Waste Producer 廢物產生者

Full Name (English) 全 名 (英 文): Commissioner of Customs and Excise
(Chinese) (中 文): 海關關長
I.D. Card No. (if any) 身份證號碼 :(如有者): ---
Business Reg. Cert. No. (if any) 商業登記證號碼 (如有者): ---
Address for Correspondence 通訊地址: Supplies Section, 29/F., Customs Headquarters Building, 222 Java Road, North Point, H.K.
Tel. No. 電話: 3759 3941
Fax No. 圖文傳真: 2854 3987

With reference to your application dated 05 / 10 / 2012 for registration as a Waste Producer under the Waste Disposal (Chemical Waste) (General) Regulation, the Waste Producer Number, WPN 0|0|1|2–7|5|6–C|3|7|6|0–0|1 is assigned to you in respect of the location or premises listed below:—
前於 2012年 10 月 05 日 根據廢物處置(化學廢物)(一般)規例而來信，申請登記爲廢物產生者，茲特配予廢物產生者編號第 0|0|1|2–7|5|6–C|3|7|6|0–0|1 號，予下開地點或樓宇: —

Location or Premises where the waste is produced 產生廢物的地點或樓宇

Name of Establishment 機構名稱: Customs and Excise Department
Business Reg. Cert. No. (if any) 商業登記證號碼: (如有者) ---
Nature of Business 業務性質: --
Major chemical waste types 主要化學廢物種類: Spent battery
Address 地址: 39 Hang Tai Road, Tai Shui Hang, Shatin, N.T.
Tel. No. 電話: 2647 1895
Fax No. 圖文傳真: 2707 4026
Contact Person (Full Name) 聯絡人: (全名) Mr. LAI Mau-yee
(Capacity) (職位) Supplies Supervisor I

ENVIRONMENTAL PROTECTION DEPARTMENT 環境保護署 HONG KONG

(CHENG Hing-wai, Henry)
for *Director of Environmental Protection*
環境保護署署長 (鄭慶偉 代行)

Date 日期 9 / 10 / 2012

WARNING : Any registered waste producer who fails to inform the Director of Environmental Protection of any change in his registration particulars commits an offence and is liable on conviction to a fine of $10,000.
警 告 : 任何已登記的廢物產生者，若其登記資料有任何改變而不知會環境保護署署長，即屬違法，被定罪者最高罰款港幣10,000元。

EPD 130

AECOM
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
香港新界沙田鄉事會路138號
新城市中央廣場第2座8樓
www.aecom.com

+852 3922 9000 tel
+852 3922 9797 fax

Our Ref.: CYKY:TXT:kchy:60334056/5.1-2015013123W

12 October 2015

12 OCT 2015
FAXED

By Hand & Fax (2854 3987)

Customs and Excise Department
Administration and Human Resource
Development Branch (AD Branch)
29/F, Customs Headquarters Building,
222 Java Road, North Point, Hong Kong

Attn.: Ms. Fanny Chan

Dear Madam,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Contamination Assessment Plan – Request for Information on Sha Tin Vehicle Detention Centre (STVDC)

We refer to our letter ref. RCYK:CYKY:TXT:KLKH:kchy:60334056/5.1-2015010861W dated 27 August 2015 regarding the submission of captioned Contamination Assessment Plan (CAP).

Following to the above referred letter, we have received comments from Environmental Protection Department (EPD) relating to the potential land contamination concerns within the Sha Tin Vehicle Detention Centre (STVDC). The relevant EPD's comment is extracted below for your reference:

"According to Photo No. B5 in Appendix 2.03b showing the seized goods, it appears that some containers for "chemicals" were stored in open area without proper containment so that any chemicals/residues inside these containers might have the potential for causing land contamination. Please obtain written correspondence from C&ED that (i) "only" emptied containers were stored and (ii) any seized goods of containers with chemicals, fuel, oil, etc. would be "emptied" and completely "cleaned up" off-site to ensure that there are no residues of chemicals/fuel/oil inside these emptied containers before their storage in the Sha Tin Vehicle Detention Centre."

From the above, we would be grateful if you could, if appropriate, provide a written confirmation for the above underlined statement. Photo No. B5 in Appendix 2.03b of the CAP is enclosed herewith for your ease of reference.

Your assistance in this matter will be greatly appreciated. Should you have any queries, please feel free to contact the undersigned at 3922 9345 or email via cherry.yau@aecom.com.

Yours faithfully,
for and on behalf of
AECOM Asia Co. Ltd.

Cherry Yau
Technical Director
Water & Urban Development

Encl.

香港海關
香港北角渣華道222號
海關總部大樓29字樓
物料供應組

HONG KONG
CUSTOMS & EXCISE DEPARTMENT
SUPPLIES SECTION
29/F, Customs Headquarters Building,
222 Java Road,
North Point, Hong Kong

Our Ref. : (32) in OFA SO/S/4S Pt.12
Our Tel. No. : (852) 3759 3937
Our Fax No. : (852) 2854 3987

By Fax
(Fax: ~~3922 9797~~)
39229750
4 November 2015

AECOM Asia Co. Ltd.
8/F Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, Hong Kong
(Attn: Ms Cherry YAU)

Dear Ms YAU,

Agreement No. CE 30/2014 (DS)
Relocation of Sha Tin Sewage Treatment Works to Caverns:
Caverns and Sewage Treatment Works – Investigation, Design and Construction

Contamination Assessment Plan -
Request for Information on Sha Tin Vehicle Detention Centre (STVDC)

I refer to your letter under reference CYKY:TXT:KLKH:kchy:60334056/5.1-2015013850W of 27 October 2015 in respect of the above subject.

One lot of spent batteries was collected at STVDC by EPD's licensed chemical waste collector in Year 2012. No past records of battery leakage occurred within STVDC. For your information, apart from those vehicle batteries installed in the vehicles, STVDC do not keep detached vehicle batteries with battery solution.

...../2

In case you have any further enquiry, please feel free to contact me or Mr. Alan WONG at 3759 3941.

Yours sincerely,

(Ms CHAN Lai-fan)
for Commissioner of Customs and Excise

c.c. CE/SP, DSD
Fax No.: 2827 8700

CAP Appendix 3.01

Typical Design of a Groundwater Monitoring Well

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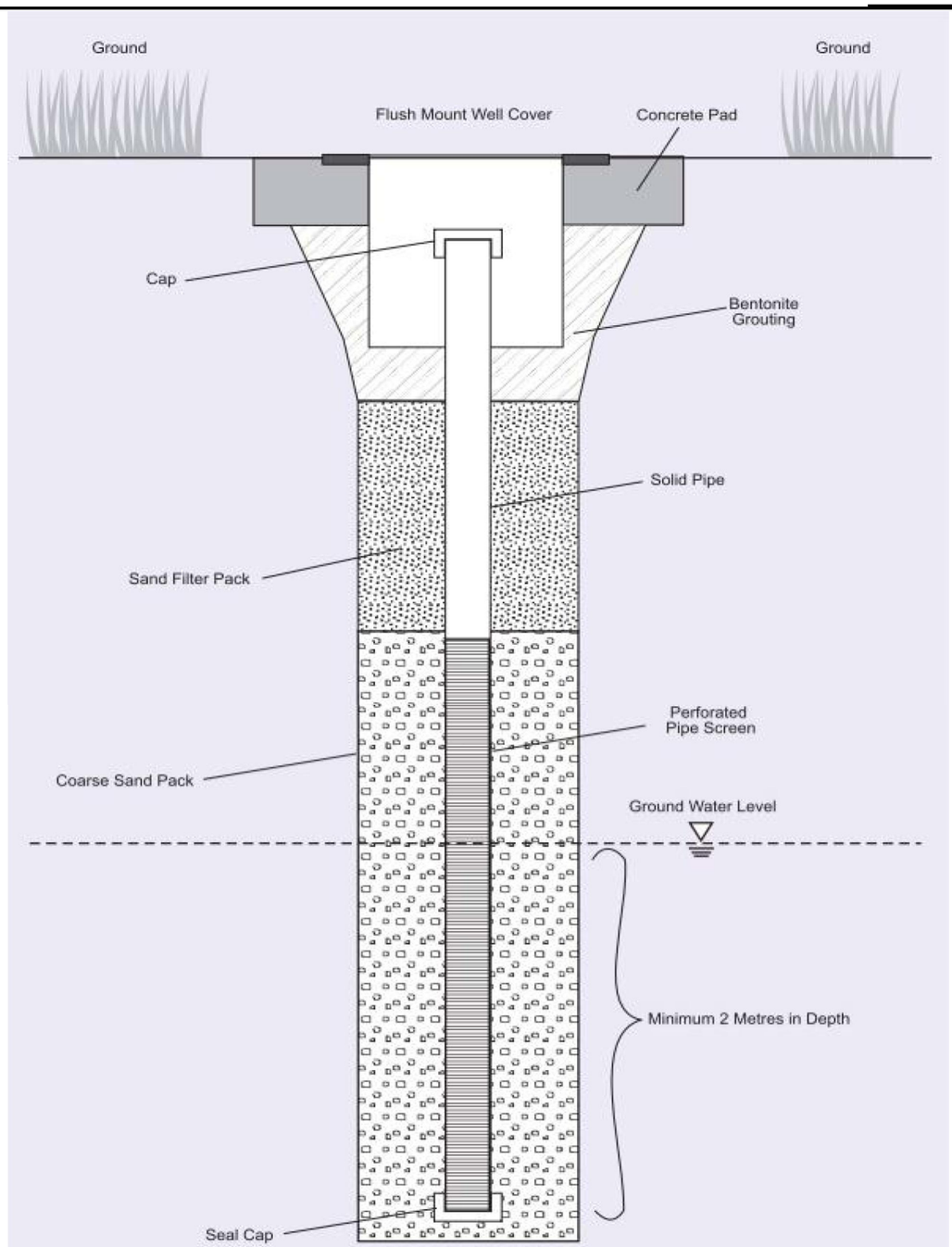

AECOM

AGREEMENT NO. CE 30/2014 (DS) - RELOCATION OF SHA TIN SEWAGE TREATMENT WORK TO CAVERNS:

CAVERNS AND SEWAGE TREATMENT WORKS - IDC

TYPICAL DESIGN OF GROUNDWATER WELL

SCALE	N.T.S.	DATE	25/11/2014
CHECK	LUKHYL	DRAWN	LEETH
JOB NO.	60334056	APPENDIX. 3.01	Rev A

CAP Appendix 5.01

RBRGs for Soil and Groundwater, Soil Saturation Limit and Solubility Limit

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Table 2.1
Risk-Based Remediation Goals (RBRGs) for Soil & Soil Saturation Limit

Chemical	Risk-Based Remediation Goals for Soil				Soil Saturation Limit (C_{sat}) (mg/kg)
	Urban Residential (mg/kg)	Rural Residential (mg/kg)	Industrial (mg/kg)	Public Parks (mg/kg)	
VOCs					
Acetone	9.59E+03	4.26E+03	1.00E+04*	1.00E+04*	***
Benzene	7.04E-01	2.79E-01	9.21E+00	4.22E+01	3.36E+02
Bromodichloromethane	3.17E-01	1.29E-01	2.85E+00	1.34E+01	1.03E+03
2-Butanone	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	***
Chloroform	1.32E-01	5.29E-02	1.54E+00	2.53E+02	1.10E+03
Ethylbenzene	7.09E+02	2.98E+02	8.24E+03	1.00E+04*	1.38E+02
Methyl tert-Butyl Ether	6.88E+00	2.80E+00	7.01E+01	5.05E+02	2.38E+03
Methylene Chloride	1.30E+00	5.29E-01	1.39E+01	1.28E+02	9.21E+02
Styrene	3.22E+03	1.54E+03	1.00E+04*	1.00E+04*	4.97E+02
Tetrachloroethene	1.01E-01	4.44E-02	7.77E-01	1.84E+00	9.71E+01
Toluene	1.44E+03	7.05E+02	1.00E+04*	1.00E+04*	2.35E+02
Trichloroethene	5.23E-01	2.11E-01	5.68E+00	6.94E+01	4.88E+02
Xylenes (Total)	9.50E+01	3.68E+01	1.23E+03	1.00E+04*	1.50E+02
SVOCs					
Acenaphthene	3.51E+03	3.28E+03	1.00E+04*	1.00E+04*	6.02E+01
Acenaphthylene	2.34E+03	1.51E+03	1.00E+04*	1.00E+04*	1.98E+01
Anthracene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.56E+00
Benzo(a)anthracene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Benzo(a)pyrene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Benzo(b)fluoranthene	9.88E+00	1.01E+01	1.78E+01	2.04E+01	
Benzo(g,h,i)perylene	1.80E+03	1.71E+03	1.00E+04*	5.74E+03	
Benzo(k)fluoranthene	1.20E+02	1.14E+02	9.18E+02	3.83E+02	
bis-(2-Ethylhexyl)phthalate	3.00E+01	2.80E+01	9.18E+01	9.42E+01	
Chrysene	8.71E+02	9.19E+02	1.14E+03	1.54E+03	
Dibenzo(a,h)anthracene	1.20E+00	1.14E+00	9.18E+00	3.83E+00	
Fluoranthene	2.40E+03	2.27E+03	1.00E+04*	7.62E+03	
Fluorene	2.38E+03	2.25E+03	1.00E+04*	7.45E+03	5.47E+01
Hexachlorobenzene	2.43E-01	2.20E-01	5.82E-01	7.13E-01	
Indeno(1,2,3-cd)pyrene	1.20E+01	1.14E+01	9.18E+01	3.83E+01	
Naphthalene	1.82E+02	8.56E+01	4.53E+02	9.14E+02	1.25E+02
Phenanthrene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	2.80E+01
Phenol	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	7.26E+03
Pyrene	1.80E+03	1.71E+03	1.00E+04*	5.72E+03	
Metals					
Antimony	2.95E+01	2.91E+01	2.61E+02	9.79E+01	
Arsenic	2.21E+01	2.18E+01	1.96E+02	7.35E+01	
Barium	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Cadmium	7.38E+01	7.28E+01	6.53E+02	2.45E+02	
Chromium III	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Chromium VI	2.21E+02	2.18E+02	1.96E+03	7.35E+02	
Cobalt	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Copper	2.95E+03	2.91E+03	1.00E+04*	9.79E+03	
Lead	2.58E+02	2.55E+02	2.29E+03	8.57E+02	
Manganese	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Mercury	1.10E+01	6.52E+00	3.84E+01	4.56E+01	
Molybdenum	3.69E+02	3.64E+02	3.26E+03	1.22E+03	
Nickel	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Tin	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Zinc	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	
Dioxins / PCBs					
Dioxins (I-TEQ)	1.00E-03	1.00E-03	5.00E-03	1.00E-03	
PCBs	2.36E-01	2.26E-01	7.48E-01	7.56E-01	
Petroleum Carbon Ranges					
C6 - C8	1.41E+03	5.45E+02	1.00E+04*	1.00E+04*	1.00E+03
C9 - C16	2.24E+03	1.33E+03	1.00E+04*	1.00E+04*	3.00E+03
C17 - C35	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+04*	5.00E+03
Other Inorganic Compounds					
Cyanide, free	1.48E+03	1.46E+03	1.00E+04*	4.90E+03	
Organometallics					
TBTO	2.21E+01	2.18E+01	1.96E+02	7.35E+01	

Notes:
(1) For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks", while the low end of the range of values for industrial, 5 ppb, has been applied to the scenario of "Industrial".
(2) Soil saturation limits for petroleum carbon ranges taken from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil, CCME 2000.
(3) * indicates a 'ceiling limit' concentration.
(4) *** indicates that the C_{sat} value exceeds the 'ceiling limit' therefore the RBRG applies.

Table 2.2
Risk-Based Remediation Goals (RBRGs) for Groundwater and Solubility Limit

Chemical	Risk-Based Remediation Goals for Groundwater			Solubility Limit (mg/L)
	Urban Residential (mg/L)	Rural Residential (mg/L)	Industrial (mg/L)	
VOCs				
Acetone	1.00E+04*	1.00E+04*	1.00E+04*	***
Benzene	3.86E+00	1.49E+00	5.40E+01	1.75E+03
Bromodichloromethane	2.22E+00	8.71E-01	2.62E+01	6.74E+03
2-Butanone	1.00E+04*	1.00E+04*	1.00E+04*	***
Chloroform	9.56E-01	3.82E-01	1.13E+01	7.92E+03
Ethylbenzene	1.02E+03	3.91E+02	1.00E+04*	1.69E+02
Methyl tert-Butyl Ether	1.53E+02	6.11E+01	1.81E+03	***
Methylene Chloride	1.90E+01	7.59E+00	2.24E+02	***
Styrene	3.02E+03	1.16E+03	1.00E+04*	3.10E+02
Tetrachloroethene	2.50E-01	9.96E-02	2.95E+00	2.00E+02
Toluene	5.11E+03	1.97E+03	1.00E+04*	5.26E+02
Trichloroethene	1.21E+00	4.81E-01	1.42E+01	1.10E+03
Xylenes (Total)	1.12E+02	4.33E+01	1.57E+03	1.75E+02
SVOCs				
Acenaphthene	1.00E+04*	7.09E+03	1.00E+04*	4.24E+00
Acenaphthylene	1.41E+03	5.42E+02	1.00E+04*	3.93E+00
Anthracene	1.00E+04*	1.00E+04*	1.00E+04*	4.34E-02
Benzo(a)anthracene				
Benzo(a)pyrene				
Benzo(b)fluoranthene	5.39E-01	2.03E-01	7.53E+00	1.50E-03
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
bis-(2-Ethylhexyl)phthalate				
Chrysene	5.81E+01	2.19E+01	8.12E+02	1.60E-03
Dibenzo(a,h)anthracene				
Fluoranthene	1.00E+04*	1.00E+04*	1.00E+04*	2.06E-01
Fluorene	1.00E+04*	1.00E+04*	1.00E+04*	1.98E+00
Hexachlorobenzene	5.89E-02	2.34E-02	6.95E-01	6.20E+00
Indeno(1,2,3-cd)pyrene				
Naphthalene	6.17E+01	2.37E+01	8.62E+02	3.10E+01
Phenanthrene	1.00E+04*	1.00E+04*	1.00E+04*	1.00E+00
Phenol				
Pyrene	1.00E+04*	1.00E+04*	1.00E+04*	1.35E-01
Metals				
Antimony				
Arsenic				
Barium				
Cadmium				
Chromium III				
Chromium VI				
Cobalt				
Copper				
Lead				
Manganese				
Mercury	4.86E-01	1.84E-01	6.79E+00	
Molybdenum				
Nickel				
Tin				
Zinc				
Dioxins / PCBs				
Dioxins (I-TEQ)				
PCBs	4.33E-01	1.71E-01	5.11E+00	3.10E-02
Petroleum Carbon Ranges				
C6 - C8	8.22E+01	3.17E+01	1.15E+03	5.23E+00
C9 - C16	7.14E+02	2.76E+02	9.98E+03	2.80E+00
C17 - C35	1.28E+01	4.93E+00	1.78E+02	2.80E+00
Other Inorganic Compounds				
Cyanide, free				
Organometallics				
TBTO				

Notes:
(1) Blank indicates that RBRG could not be calculated because the toxicity or physical/chemical values were unavailable, or the condition of Henry's Law Constant>1.00E-05 was not met for the inhalation pathway.
(2) Water solubilities for Petroleum Carbon Range aliphatic C9-C16 and greater than C16 generally are considered to be effectively zero and therefore the aromatic solubility for C9-C16 is used.
(3) * indicates a 'ceiling limit' concentration.
(4) *** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.