

TABLE OF CONTENT

1	INTRODUCTION	1
1.1	Project Background.....	1
1.2	Purpose of the Report.....	1
1.3	Environmental Legislation, Standards and Criteria	1
1.4	Structures of this Report	2
2	DESCRIPTION OF PROPOSED HSKEPP SITE.....	3
2.1	General.....	3
2.2	Proposed HSKEPP Site and Previous EIA Study	3
3	SITE APPRAISAL	5
3.1	Review of Historical Land Uses.....	5
3.2	Geology and Hydrogeology	6
3.3	Records from Government Authorities.....	7
3.4	Further Site Reconnaissance	8
3.5	Future Land Uses and Assessment Criteria	9
4	SITE INVESTIGATION REQUIREMENTS	13
4.1	Sampling and Testing Plan	13
4.2	Soil Sampling Method and Depth of Sampling.....	17
4.3	Strata Logging	17
4.4	Groundwater Sampling and Free Product Measurement	17
4.5	Sample Size and Decontamination Procedures.....	18
4.6	Quality Assurance / Quality Control (QA/QC) Procedures.....	18
4.7	Health and Safety	19
4.8	Laboratory Analysis	20
5	INITIAL EVALUATION OF POTENTIAL LAND CONTAMINATION IMPACT AND POSSIBLE REMEDIATION MEASURES	22
5.1	Initial Evaluation of Potential Land Contamination Impact.....	22
5.2	Possible Remediation Measures	22
6	FURTHER WORKS AND TENTATIVE PROGRAMME SCHEDULE.....	24
7	CONCLUSION.....	25

List of Tables

Table 2.1	Summary of EIA Surveyed Sites within the Proposed HSKEPP Site	3
Table 3.1	Latest Aerial Photograph Reviewed.....	6
Table 3.2	Summary of Chemical Waste Producers within the Proposed HSKEPP Site	7
Table 3.3	Summary of Potential Land Contamination Issues within the Northern Portion of Proposed HSKEPP (SWPTW).....	11
Table 3.4	Summary of Potential Land Contamination Issues within the Southern Portion of Proposed HSKEPP	12
Table 4.1	Sampling and Testing Plan for Decommissioned SWPTW in Northern Portion of Proposed HSKEPP	14
Table 4.2	Preliminary Sampling and Testing Plan for Southern Portion of Proposed HSKEPP	16
Table 4.3	Parameters, Reporting Limits and Reference Methods for Laboratory Analysis...	20

List of Figures

Figure 1.1	Location Plan of HSKEPP and Land Contamination Assessment Area under HSK NDA EIA Study
Figure 2.1	Project Layout Plan and Relevant EIA Surveyed Sites

Figure 3.1	Locations of Identified Potentially Contaminated Sites / Hotspots
Figure 4.1	Concerned Areas and Proposed Sampling Locations (Northern Portion of Proposed HSKEPP)

List of Appendices

Appendix A	Relevant Historical Aerial Photographs
Appendix B	Details of Relevant EIA Surveyed Sites (Extracted from HSK NDA EIA CAP)
Appendix C	Photographic Records of Site Walkover
Appendix D	Site Walkover Checklists
Appendix E	Responses from Government Departments on Relevant Information
Appendix F	Relevant RBRGs, Soil Saturation Limit and Solubility Limit
Appendix G	Typical Design of Groundwater Monitoring Well

1 INTRODUCTION

1.1 Project Background

- 1.1.1.1 The Government plans to develop Hung Shui Kiu/Ha Tsuen New Development Area (HSK/HT NDA) for providing land to meet the medium and long-term housing, social and economic needs. The HSK/HT NDA is proposed to accommodate a population of approximately 176,000 persons and generate about 150,000 employment opportunities respectively on full development.
- 1.1.1.2 The purpose of the Project is to provide sewage treatment to the sewage collected from the HSK/HT NDA and other developments in the North West New Territories (NWNT), and to subsequently dispose the treated effluent.
- 1.1.1.3 The Civil Engineering and Development Department (CEDD) commenced Agreement, namely the *Agreement No. CE 2/2011 (CE) "Hung Shui Kiu New Development Area, Planning and Engineering – Investigation"* in 2011, to formulate the detailed development proposals for the HSK/HT NDA. This Study recommends that the sewage generated from the HSK/HT NDA will be discharged to separate new sewage treatment work, namely the Hung Shui Kiu Effluent Polishing Plant (HSKEPP) which is located in the north-western side of the HSK/HT NDA.
- 1.1.1.4 The above study recommended preliminary treatment capacity, treatment level and discharge arrangement of HSKEPP taking into account the constraints for discharge to North Western Waters and Deep Bay. Further reviews of flow projection, treatment level, treated effluent discharge and sludge treatment scheme shall be carried out to formulate the preliminary design of HSKEPP to cater for the sewage collected from the new developments within the HSK/HT NDA and other developments in the North West New Territories (NWNT) to support the medium and long-term housing and economic needs of the NWNT.
- 1.1.1.5 AECOM Asia Co Ltd. was commissioned by Drainage Services Department (DSD) on 20 March 2020 to carry out this Assignment for the investigation for HSKEPP. Site location plan of the HSKEPP is shown in **Figure 1.1**.

1.2 Purpose of the Report

- 1.2.1.1 Based on the EIA Study Brief (No. ESB-312/2019), an assessment on the potential land contamination issues within the proposed HSKEPP for development works is required.
- 1.2.1.2 This Contamination Assessment Plan (CAP) is prepared for the EIA study. The purposes of this CAP are to present the findings of the site appraisal on the past and present potentially contaminative land uses / activities and to propose sampling and testing plan for the subsequent site investigation (SI) works in order to assess the presence, nature and extent of any contamination within the proposed HSKEPP.

1.3 Environmental Legislation, Standards and Criteria

- 1.3.1.1 This CAP is prepared with reference to the following EPD issued guidelines:
- (a) Section 3 (Potential Contaminated Land Issues) of Appendix 19 "Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts" of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).
- (b) Guidance Note for Contaminated Land Assessment and Remediation (Guidance Note)

The Guidance Note sets out the requirements for proper assessment and management of potentially contaminated sites such as oil installations (e.g. oil depots, petrol filling

stations), gas works, power plants, shipyards / boatyards, chemical manufacturing / processing plants, steel mills / metal workshops, car repairing / dismantling workshops and scrap yards. In addition, this Guidance Note provides guidelines on how site assessments should be conducted and analysed and suggests practical remedial measures that can be adopted for the remediation of contaminated sites.

- (c) Practice Guide for Investigation and Remediation of Contaminated Land (Practice Guide)

This guide outlines typical investigation methods and remediation strategies for the range of potential contaminants typically encountered in Hong Kong.

- (d) Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (Guidance Manual)

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

- 1.3.1.2 The RBRGs stipulated in the Guidance Manual will be adopted as the criteria for assessing any soil and groundwater contamination.

1.4 Structures of this Report

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

- (a) Section 2: describes the area of the proposed HSKEPP and previous EIA study;
- (b) Section 3: presents findings of the site appraisal;
- (c) Section 4: proposes the preliminary sampling and testing plan for the subsequent SI works;
- (d) Section 5: evaluates the potential land contamination impact and discusses the possible remediation measures
- (e) Section 6: recommends the further works and discusses the tentative schedule; and
- (f) Section 7: concludes the report.

2 DESCRIPTION OF PROPOSED HSKEPP SITE

2.1 General

2.1.1.1 The proposed HSKEPP is located in the western part of HSK NDA and covers a total area of approximately 5.2 ha. The proposed HSKEPP is located on a generally flat terrain and is mainly bounded by Yuen Tau Shan and Kong Sham Western Highway at its southwest side and surrounded by logistics facilities to the north and west. The northern portion of the proposed HSKEPP is currently the decommissioned San Wai Preliminary Treatment Works (SWPTW) and the southern portion is largely occupied by various industrial land uses. The locations of the northern portion (SWPTW) and southern portion of the proposed HSKEPP are shown in Figure 1.1.

2.1.1.2 Demolition of the SWPTW in the northern portion of the proposed HSKEPP will be carried out under this Project. However, site formation works for the proposed HSKEPP site (except the demolition of SWPTW) is not under the scope of this Project. The site formation works (including any decontamination works) will be undertaken by CEDD separately under the HSK NDA project prior to the construction of the proposed HSKEPP.

2.2 Proposed HSKEPP Site and Previous EIA Study

2.2.1.1 Land contamination assessment was conducted in the EIA Study for Hung Shui Kiu New Development Area (Register No.: AEIAR-203/2016) (HSK NDA EIA Study) under Agreement No. CE 2/2011 (CE) "Hung Shui Kiu New Development Area, Planning and Engineering – Investigation". The land contamination assessment area in the HSK NDA EIA Study covers the proposed HSKEPP (refer to **Figure 1.1**). The assessment included desktop study (e.g. review of aerial photographs, survey maps and relevant information from EPD and FSD) and site surveys. A CAP (HSK NDA CAP) was submitted as part of the HSK NDA EIA Study and the HSK NDA EIA Study was approved by EPD in December 2016.

2.2.1.2 Based on the approved HSK NDA EIA Study, no sites surveyed in the HSK NDA EIA Study ('EIA Surveyed Sites') were identified in the northern portion of the proposed HSKEPP. However, the southern portion of the proposed HSKEPP would encroach into 5 EIA Surveyed Sites, 4 of which were considered as potentially contaminated sites. **Table 2.1** summarises the details of these EIA Surveyed Sites. The locations of the proposed HSKEPP and the relevant EIA Surveyed Sites are shown in **Figure 2.1**.

Table 2.1 Summary of EIA Surveyed Sites within the Proposed HSKEPP Site

No.	EIA Surveyed Site ID	Suspected Land Use at the time of HSK NDA EIA Study	Partial / Full Encroachment into the Proposed HSKEPP Site	Potentially Contaminated Site?
1	C80a	Warehouse	Partial Encroachment into the Southern Portion of Proposed HSKEPP	Yes
2	C80b	Construction Material Storage and Equipment Depot		Yes
3	C81	Container and Construction Material Storage		Yes
4	C84	Warehouse		To be confirmed*
5	C85	Vacant		Yes

Note:

* The land use of Site C84 was warehouse at the time of the HSK NDA EIA Study with no

other historical potentially contaminated land uses identified. A site re-appraisal was recommended at the later stage of the development in the HSK NDA EIA Study to confirm whether the site is potentially contaminated and the necessity for site investigation works.

2.2.1.3 A review of the relevant findings of the HSK NDA EIA Study, including the HSK NDA EIA CAP, had been conducted and are discussed in **Section 3** below.

3 SITE APPRAISAL

3.1 Review of Historical Land Uses

3.1.1 Review of HSK NDA EIA Study

- 3.1.1.1 The historical land uses within the proposed HSKEPP site have been reviewed under the HSK NDA EIA Study. The review included series of aerial photographs covering the period from 1978 to 2013. Relevant historical aerial photographs reviewed under the HSK NDA EIA Study are presented in **Appendix A**.
- 3.1.1.2 In addition to the above, helicopter reconnaissance and site walkovers were undertaken under the HSK NDA EIA Study in September 2014 and December 2014 respectively to identify the land uses of the surveyed sites at the time. As discussed in **Section 2.2** above, no EIA Surveyed Sites were identified within the northern portion of the proposed HSKEPP. According to the relevant historical aerial photographs reviewed, the northern portion of the proposed HSKEPP was occupied by a fish pond from 1978 until 1995 when the SWPTW was developed and no significant land use change was noted since. For the southern portion of the HSKEPP, all of the 5 affected EIA Surveyed Sites were inaccessible at the time as the sites were under private occupation and only peripheral observations were conducted during the site walkovers.
- 3.1.1.3 Findings of the 5 EIA Surveyed Sites under the HSK NDA EIA Study, including land use history, site observations and photographic records, are presented in **Appendix B**.

3.1.2 Further Review under this CAP

- 3.1.2.1 A review of the latest available aerial photograph after the approval of HSK NDA EIA Study has been undertaken to evaluate the likelihood of potential contamination associated with past land uses within the proposed HSKEPP site. Findings of the review are summarized in **Table 3.1**. and the reviewed aerial photograph is provided in **Appendix A**.

Table 3.1 Latest Aerial Photograph Reviewed

Year	Reference of Aerial Photos in Appendix A (Photo Reference Number)	Site Description
2020	AP1 (#E105608C)	<p><u>Northern portion of proposed HSKEPP</u> The northern portion of the proposed HSKEPP remained occupied by the SWPTW. No significant change in facilities / layout of the SWPTW were observed.</p> <p><u>Southern portion of the proposed HSKEPP</u> Warehouse-type structures were observed in EIA Surveyed Site C80b, C81, C84 and C85. An open storage (Site C85a_2021), previously vacant land, was observed adjacent to Site C85. No other significant land use change was observed in the remaining areas within the southern portion of the proposed HSKEPP.</p>

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

- 3.1.2.2 Based on the review of aerial photograph above, land use changes (from storage areas / vacant land to warehouse type structures) were noted in EIA Surveyed Site C80b, C81 and C85 within the southern portion of the proposed HSKEPP since the approval of the HSK NDA EIA Study. In addition, an open storage (Site C85a_2021) was observed which was previously vacant. No significant land use changes were noted within the northern portion and remaining areas of the proposed HSKEPP.

3.2 Geology and Hydrogeology

- 3.2.1.1 Based on the Desk Study Report for Site Investigation and Laboratory Testing of this Project, there is underlain 2m to 5m thick of fill material comprising of typically sand and gravel materials on the ground surface with reference to existing ground investigation (GI) information. Occasional 1.5m to 2m pond deposit with clay material is identified in the vicinity of the proposed HSKEPP site. Alluvium deposit comprise of interbedded clay, silt and sand materials with the thickness ranging 1m to 6m, is encountered under the fill stratum. 2m to 7m thick colluvium which comprises of typically silt with some gravel material, is deposited near the natural hillside slope.
- 3.2.1.2 The proposed HSKEPP site is underlain by diversified rock materials such as siltstone, metasilstone, tuffaceous siltstone, tuffite, tuff, tuff breccia. The thickness of the saprolite (Grade IV/V material) layer is ranging 25m to 48m in the vicinity of the proposed HSKEPP site, and the rockhead level is varied from -20mPD to -43mPD according to the existing GI records.
- 3.2.1.3 The available groundwater monitoring records from the existing boreholes indicate that the average groundwater table generally range from 0.5m to 5m below ground level in the proposed HSKEPP site. The highest groundwater is recorded near the hillside on the west of the site.

3.3 Records from Government Authorities

3.3.1 Review of HSK NDA EIA Study

- 3.3.1.1 The Environmental Protection Department (EPD) and Fire Services Department (FSD) were contacted under the HSK NDA EIA Study for records of (i) Dangerous Goods (DG), (ii) Chemical Waste Producer(s) (CWP(s)), (iii) chemicals and chemical wastes releases and (iv) reported incidents within the HSK NDA EIA Study assessment area.
- 3.3.1.2 Based on the findings of the HSK NDA EIA Study, there were no DG license records, reported chemical spillage / leakage incidents or fire incidents within the proposed HSKEPP site. However, there were 4 active chemical waste producer (CWP) records within the southern portion of the proposed HSKEPP. The relevant records are summarised in **Table 3.2** below.

Table 3.2 Summary of Chemical Waste Producers within the Proposed HSKEPP Site

EIA Surveyed Site ID ⁽¹⁾	Registered Chemical Waste Producer	Address	Business Type	Status at the time of HSK NDA EIA Study	Current Status	Type of Chemical Waste
C80a	Wai Mei Dat Trading Co. Ltd	Lots 1279, 1280, 1281, 1282, 1285, 1286, 1287, 1288, 1289, 1294 (Part), 1295RP (Part), 1351 (Part), 1352 (Part), 1353, 1354, 1355, 1356, 1357, 1358RP and 1359 in DD125, Ha Tsuen Road, Ha Tsuen, Yuen Long, NT	Waste electrical and electronic equipment recovery	Valid	Invalid	Unknown
C80b & C81	Bachy Soletanche Group Limited	DD125 Lot 1188RP, 1287-1293, 1295RP, 1296-1304, 1305RP, 1321RP, 1322RP, 1325RP, 1326RP, 1327-1330, 1339-1341, 1342A, 1342B, 1343-1352, Ha Tsuen, Yuen Long NT	Construction	Valid	Invalid	Unknown
C81	Costa Holdings Limited	DD125 Lot No.1303(Part), Lot 1325PR(Part) and Lot 1326RP(Part), Ha Tsuen Road, Ha Tsuen, Yuen Long, NT	Machine maintenance	Valid	Valid	Unknown
C81	Lau Ming Transportation Co., Ltd	DD125 Lot 1341, Kai Pak Ling, Fung Kong Tsuen, Ping Shan, Yuen Long, NT	Transportation	Valid	Valid	Unknown

Note:
(1) Refer to **Figure 2.1** for the site locations.

3.3.2 Further Review under this CAP

- 3.3.2.1 The EPD and FSD have been contacted for further records of (i) DG (ii) CWP(s), (iii) chemicals and chemical wastes spillage / leakage and (iv) reported incidents within the proposed HSKEPP site since the HSK NDA EIA Study. The relevant EPD and FSD correspondences are attached in **Appendix E**.

Environmental Protection Department

- 3.3.2.2 Based on the replies given by EPD on 23 October 2020 and 28 September 2021, EPD has no chemical spillage / leakage records within the proposed HSKEPP site.
- 3.3.2.3 Further to the EPD's reply, visit to EPD's Southorn Centre Office was undertaken on 3 March 2021 to review the available CWP records. According to the records

reviewed, the same 4 CWPs as reported in the HSK NDA EIA Study were identified within the southern portion of the proposed HSKEPP. Of the 4 CWPs, the CWPs 'Wai Mei Dat Trading Co. Ltd' and 'Bachy Soletanche Group Limited' were no longer active. No CWP records were identified within the northern portion of proposed HSKEPP (SWPTW).

- 3.3.2.4 The updated information of the CWPs (including business type and status) are included in **Table 3.2**.

Fire Services Department

- 3.3.2.5 Based on the reply given by FSD on 14 January 2021, FSD has no records of DG licenses, spillage / leakage of DG or fire incidents found within the proposed HSKEPP site.

3.4 Further Site Reconnaissance

3.4.1 General

- 3.4.1.1 Site walkovers were conducted under this CAP to review the current land uses and to identify any sources of land contamination within the northern portion (SWPTW) and southern portion of the proposed HSKEPP. Findings of the site walkovers are discussed below.

3.4.2 Northern Portion of Proposed HSKEPP (SWPTW)

- 3.4.2.1 Site walkover was conducted on 14 May 2021 within the decommissioned SWPTW. The photographic records and site layout plans are shown in **Appendix C**. Questionnaire was conducted with available site representative of SWPTW from DSD and findings are incorporated in the site walkover checklist in **Appendix D**.
- 3.4.2.2 According to the site representative, the SWPTW was decommissioned in March 2021. Currently, the site is largely used for the storage of construction materials supporting the construction works of upgrading the San Wai Sewage Treatment Works (STW) (Phase 1), located adjacent to and north of the decommissioned SWPTW, under *Contract No. DC/2013/10 "Design, Build and Operate San Wai Sewage treatment Works - Phase 1"*.
- 3.4.2.3 As observed during the site walkover, the decommissioned SWPTW mainly consists of a disused inlet chamber, a former administration building, a former solids handling station, disused water storage tank, 3 disused detritors, 3 disused fine screen chambers, a transformer house and a backup generator. The former administration building mainly comprised of an office, staff rest room, store room, toilet and a workshop. Apart from the transformer house and backup generator, the observed SWPTW facilities were no longer in operation. At the time of the site walkover, storage of construction materials (e.g. plastic / metal drainage pipes) were observed in the open areas in the south and southwest of the site. Two chemical storage areas for lubricating oil / grease drums were observed in the former workshop and solids handling station. According to the site representative from DSD, these chemicals were temporarily stored on site for the current construction works of upgrading the San Wai STW (Phase 1). The remaining areas of the site are covered by access roads and vegetation. Except for the landscaped areas, all external areas including construction materials storage areas and access roads were observed to be paved with intact concrete in good condition and no oil stains / spillage / stressed vegetation were observed during the site walkover.
- 3.4.2.4 According to the site representative, prior to decommissioning of the SWPTW, the majority of repair and maintenance of plant equipment on site (e.g. pumps and valves) were carried out within the workshop in the administration building or off-site. Lubricating oils were reportedly used for equipment maintenance in the workshop

and diesel was used as fuel for the backup generator. Sodium hypochlorite solution (bleach) was reportedly used for preliminary sewage treatment on site. As bleach is not considered as a land contaminant, no potential land contamination issues were anticipated from the usage / storage of bleach on site. Based on EPD/FSD/DSD records, there were no reported chemical spillage / leakage incidents within the decommissioned SWPTW.

3.4.2.5 Based on the site walkover, there are potential land contamination issues associated with past and current facilities / areas that handled chemicals or petroleum products / chemical wastes. The past and current facilities / areas include the former workshop, the existing chemical storage area in the former solids handling station, the existing backup generator and transformer house. No potentially contaminating land uses / activities were identified in the remaining areas of the decommissioned SWPTW.

3.4.2.6 Findings of the site walkover for the past and current facilities / areas identified within SWPTW with potential land contamination concerns are summarised in **Table 3.3**

3.4.3 Southern Portion of Proposed HSKEPP

3.4.3.1 Site walkover was conducted on 25 August 2021 within the southern portion of the proposed HSKEPP. Similar to the findings of the HSK NDA EIA Study, the southern portion of the proposed HSKEPP largely consists of potentially contaminated sites (e.g. warehouses and container storage at EIA Surveyed Site C80a, C80b, C81, C84 and C85). An additional potentially contaminated site (Site C85a_2021) was observed, which was previously vacant. A total of 6 potentially contaminated sites were identified within the southern portion of the proposed HSKEPP. All the sites were private land lots and were inaccessible at the time of site walkover for inspection.

3.4.3.2 Findings of site walkover for the potentially contaminated sites are summarised in **Table 3.4**. Photographic records taken during the site walkover are presented in **Appendix C**. The site walkover checklist is presented in **Appendix D**.

3.5 Future Land Uses and Assessment Criteria

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

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

- Urban residential
- Rural residential
- Industrial
- Public parks

3.5.1.3 As the proposed development under the Project is related to sewage treatment works, the Industrial land use scenario is considered appropriate as the assessment criteria. Nevertheless, as recommended in the HSK NDA CAP, in the event that future land

use is revised subsequent to the HSK NDA CAP or in doubt during the assessment, the most stringent set of the RBRGs should be adopted.

3.5.1.4 The future land uses and the appropriate RBRGs land use scenarios are shown in **Table 3.3** and **Table 3.4**.

Table 3.3 Summary of Potential Land Contamination Issues within the Northern Portion of Proposed HSKEPP (SWPTW)

Concerned Facility / Area (Approx. Area) ⁽¹⁾	Hotspot (Approx. Area) ⁽¹⁾	Site Observation / Current Potentially Contaminated Land Uses and Activities	Site Walkover Photographic Record Reference in Appendix C	Other Historical Potentially Contaminated Land Use / Activities ⁽²⁾	Potential COCs ⁽³⁾	Future Land Use	Relevant RBRGs Land Use Scenario
Former workshop in administration building (25 m ²)	- Existing chemical storage area (1 m ²) - Former chemical waste storage area (1 m ²)	<ul style="list-style-type: none"> A former workshop was observed within the administration building in the northeast of SWPTW. The workshop was concrete paved noted to be in good condition with no oil stains / spillage observed. The workshop has ceased operation since the SWPTW was decommissioned in March 2021. Repair and maintenance for plant equipment on site (e.g. pumps and valves) were reportedly conducted in the workshop when the SWPTW was in operation. Typical maintenance may have included greasing and lubrication involving lubrication oils. A signage of 'chemical waste' was observed in the former workshop, indicating possible former chemical waste storage. A few spent lubricating oil drums were observed in the former workshop, which were stored directly on concrete paved floor. According to the site representative from DSD, these chemicals were temporarily stored on site for the current construction works of upgrading the San Wai STW (Phase 1) (adjacent to and north of SWPTW). 	Photo 2191, 6848 & 7307 in PR1	-	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Effluent polishing plant	Industrial
Former solids handling station (370 m ²)	Existing chemical storage area (2 m ²)	<ul style="list-style-type: none"> The former solids handling station is located in the northwest of the SWPTW and comprised of a control room on the ground floor and a screening press room on the basement floor. The station has ceased operation since the SWPTW was decommissioned in March 2021. All internal floors were generally paved with concrete or tiles in good condition. Storage of sodium hypochlorite solution (bleach) was observed on wooden pallet in the north of the basement floor. No signs of spillage were observed on the tiled floor in the vicinity of the storage area. As bleach is not considered as a land contaminant, no potential land contamination issues associated with the usage and storage of bleach were anticipated. 9 lubricating oil / grease drums were observed in the south of the basement floor, which were stored directly on tiled floor. Oil stains were observed on the tiled floor in the vicinity of the chemical storage area. According to the site representative from DSD, these chemicals were temporarily stored on site for the current construction works of upgrading the San Wai STW (Phase 1) (adjacent to and north of SWPTW). Based on site observation and information provided by the site representative, except for the existing chemical storage area, no other potentially contaminating activities were identified in the former solids handling station. 	Photo 6907 in PR1, 2242 & 7345 in PR2	-	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Effluent polishing plant	Industrial
Backup generator (15 m ²)	Generator (15 m ²)	<ul style="list-style-type: none"> A diesel-powered generator set with a 500L diesel tank was observed in the southeast of SWPTW. The generator was reportedly used as the backup emergency generator for the site. The generator was situated directly on intact concrete paved ground with no signs of oil stains / spillage observed in the vicinity. 	Photo 7329 in PR1	-	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Effluent polishing plant	Industrial
Transformer house (110 m ²)	Transformer*	<ul style="list-style-type: none"> The existing transformer house is located in the southeast of SWPTW and is currently operated by CLP and was inaccessible for detailed site inspection. As reported by the site representative from DSD, the transformer house consists of a switch gear room and a transformer room. Based on peripheral observations, the transformer house was located on concrete paved ground in good condition with no signs of oil stains / spillage observed in the vicinity. 	Photo 6870 in PR1	-	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs PCBs 	Effluent polishing plant	Industrial

Note:

(1) Refer to **Figure 3.1** for locations of the concerned areas.

(2) Based on the findings under the HSK NDA EIA Study. Refer to **Appendix A** for the relevant historical aerial photographs.

(3) The potential COCs were determined based on Practice Guide.

PCRs – petroleum carbon ranges; VOCs – volatile organic chemicals; SVOCs – semi-volatile organic chemicals and PCBs – polychlorinated biphenyls.

* The location and area of the transformer shall be confirmed when the transformer house was accessible for detailed site inspection.

Table 3.4 Summary of Potential Land Contamination Issues within the Southern Portion of Proposed HSKEPP

Potentially Contaminated Site ID ⁽¹⁾	Suspected Current Land Use	Approx. Site Area (m ²)	Site Observation / Current Potentially Contaminated Land Uses and Activities	Site Walkover Photographic Record Reference in Appendix C	Historical Potentially Contaminated Land Use / Activities ⁽²⁾	Potential COCs ⁽³⁾	Partial / Full Encroachment into Proposed HSKEPP Site	Relevant RBRGs Land Use Scenario ⁽⁴⁾
C80a	Warehouse	9,080 (Area encroached into Project: 8,010)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. Large warehouse-type structures and bags of goods on wooden pallets were observed on concrete paved floor from the outside. Based on EPD information, 1 invalid CWP record registered for waste electrical and electronic equipment recovery was identified for the site. No chemical spillage / DG / incident records were identified for the site. 	Photo 8480 in PR3	Container storage, open area storage, recycling facility and warehouse	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs PCBs 	Partial	Industrial
C80b	Warehouse	17,180 (Area encroached into Project: 16,150)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. A large warehouse and trucks were observed from the outside. The site was largely concrete paved. Based on EPD information, 1 invalid CWP record registered for construction was identified for the site. No chemical spillage / DG / incident records were identified for the site. 	Photo 8484 in PR3	Construction material storage and equipment depot / warehouse	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Partial	Industrial
C81	Warehouse and container storage	25,640 (Area encroached into Project: 7,680)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. Large warehouse-type structures, open storage of containers and container handler were observed on concrete paved ground from the outside. Based on EPD information, 2 valid CWP records registered for machine maintenance and transportation, and 1 invalid CWP records registered for construction were identified for the site. No chemical spillage / DG / incident records were identified for the site. 	Photo 8486 & 9429 in PR3	Container and construction material storage / warehouse	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Partial	Industrial
C84	Warehouse	1,020 (Area encroached into Project: 860)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. Temporary warehouse-type structures and lorries were observed on concrete paved ground from the outside. Based on EPD / FSD information, there were no chemical spillage / CWP / DG / incident records for the site. 	Photo 7574 & 9384 in PR4	Warehouse	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Partial	Industrial
C85	Warehouse	6,000 (Area encroached into Project: 1,070)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. Large temporary warehouse-type structure was observed. Based on EPD / FSD information, there were no chemical spillage / CWP / DG / incident records for the site. 	Photo 7486 & 8496 in PR4	Warehouse	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Partial	Lower of Industrial or Public Park
C85a_2021	Open area storage	1,680 (Area encroached into Project: 1,040)	<ul style="list-style-type: none"> The site was inaccessible for site inspection. Pipes and metal sheets were observed on unpaved ground from the outside. Based on EPD / FSD information, there were no chemical spillage / CWP / DG / incident records for the site. 	Photo 7486 & 9391 in PR4	Open area storage	<ul style="list-style-type: none"> Metals (Full List) VOCs (Full List) SVOCs (Full List) PCRs 	Partial	Lower of Industrial or Public Park

Note:
 (1) Refer to **Figure 3.1** for locations of the potentially contaminated sites.
 (2) Based on the findings under the HSK NDA EIA Study. Refer to **Appendix A** and **B** for the relevant historical aerial photographs and details of the development history for the potentially contaminated land uses / activities.
 (3) The potential COCs were determined based on Practice Guide and took in account current and historical land uses, which are subject to change based on site re-appraisal when site access is available.
 PCRs – petroleum carbon ranges; VOCs – volatile organic chemicals; SVOCs – semi-volatile organic chemicals and PCBs – polychlorinated biphenyls.
 (4) The relevant RBRGs land use scenarios would be subject to findings of the site re-appraisal (refer to **Section 6**).

4 SITE INVESTIGATION REQUIREMENTS

4.1 Sampling and Testing Plan

4.1.1 Northern Portion of Proposed HSKEPP (SWPTW)

- 4.1.1.1 Based on the findings of the site appraisal, intrusive SI works is considered necessary for the 4 facilities / areas identified with potential land contamination concerns at the SWPTW in the northern portion of the proposed HSKEPP. A total of 6 sampling locations are proposed to study the vertical profile of possible contamination at the SWPTW. The proposed sampling locations followed the recommended grid sampling arrangement in Table 2.1 of EPD Practice Guide and have taken into account the sources of contamination (i.e. hotspots) identified during the site walkover. However, as the existing transformer house was inaccessible for site walkover at the time of reporting, the proposed sampling location within the transformer house should be reviewed when access is available for site re-appraisal at a later stage of the Project. The key COCs for the concerned areas were determined with reference to EPD's Practice Guide and include VOCs, SVOCs, metals, PCRs and PCBs.
- 4.1.1.2 Details of the sampling and testing plan are shown in **Table 4.1** and the sampling locations are illustrated in **Figure 4.1**. The exact sampling locations are subject to fine adjustment according to the actual site conditions and existence of underground structures/utilities as determined by the on-site land contamination specialist.
- 4.1.1.3 Permission of conducting SI works at the SWPTW could not be obtained from DSD as all the concerned facilities are still in use (the former workshop and solids handling station for material storage and the existing transformer house and backup generator for power generation) until demolition of the site. Therefore, it is considered not feasible to conduct the proposed SI works under this EIA study. Given that the transformer house is inaccessible and that the concerned facilities are still in use, site re-appraisal for the entire northern portion of the proposed HSKEPP and SI works should be carried out at a later stage of the Project (refer to **Section 6** for details).

4.1.2 Southern Portion of Proposed HSKEPP

- 4.1.2.1 Based on the findings of the HSK NDA EIA Study and site appraisal, 6 potentially contaminated sites were identified within the southern portion of the proposed HSKEPP. However, all these concerned sites were inaccessible at the time of reporting to determine the sampling locations for SI works. Given that all of the concerned sites are inaccessible at this stage in time and that re-development of the concerned sites would only commence after a number of years, site re-appraisal should be carried out when site access is available to determine the actual sampling and testing requirements for the concerned sites.
- 4.1.2.2 A preliminary sampling and testing plan for these potentially contaminated sites has been prepared based on the findings of the HSK NDA EIA Study and site appraisal and with reference to EPD's Practice Guide. Details of the preliminary sampling and testing plan is shown in **Table 4.2**. Grid sampling strategy, in accordance with Table 2.1 of the Practice Guide and recommendations of the HSK NDA EIA Study, was generally adopted for these potentially contaminated sites. Subject to the findings of site re-appraisal when site access is available, extra sampling locations may be required for any additional potential sources of contamination (or 'hotspots') within the concerned sites. The key COCs for the potentially contaminated sites were determined with reference to EPD's Practice Guide and include VOCs, SVOCs, metals, PCRs and PCBs.

Table 4.1 Sampling and Testing Plan for Decommissioned SWPTW in Northern Portion of Proposed HSKEPP

Concerned Facility / Area (Approx. Area)	Hotspot (Approx. Area)	Sampling Location ID ⁽¹⁾	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth ⁽²⁾		Parameters to be Tested ⁽³⁾				
							PCRs	VOCs	SVOCs	Metals	PCBs
Former workshop in administration building (25 m ²)	-	SWENV-BH01	Sampling to target the former workshop (approx. 25 m ²)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	-
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	-
	Existing chemical storage Area (1 m ²)	SWENV-BH02	Target potential hotspot area at chemical storage area (approx. 1 m ²)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	-
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	-
	Former chemical waste storage area (1 m ²)	SWENV-BH03	Target potential hotspot area at former chemical waste storage area (approx. 1 m ²)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	-
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	-
Former solids handling station (370 m ²)	Existing chemical storage area (2 m ²)	SWENV-BH04	Target potential hotspot area at chemical storage area (2 m ²)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	-
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	-
Backup generator	Generator (15 m ²)	SWENV-BH05	Target potential hotspot area at generator (approx. 15 m ²)	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	-
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	-
Transformer house (110 m ²)	Transformer ⁽⁵⁾	SWENV-BH06 ⁽⁵⁾	Target potential hotspot area (e.g. transformer) at transformer house	Borehole drilling to 2m below the groundwater table or 6m bgl	Soil	(i) 0.5m bgl (ii) 1.5m bgl (iii) 3.0m bgl (iv) at GW level or 6m bgl ⁽⁴⁾	✓	✓	✓	✓	✓
					GW	If present ⁽⁴⁾	✓	✓	✓	Mercury only	✓

Note:

- (1) Refer to **Figure 4.1** for concerned facility / area and proposed sampling locations.
- (2) bgl = below ground level; GW = groundwater
- (3) The testing parameters refer to the parameters as shown in Table 2.1 – RBRGs for Soil & Soil Saturation Limit and Table 2.2 – RBRGs for Groundwater and Solubility Limit under VOCs, SVOCs, Metals, PCBs and PCRs 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 said parameters would not be tested in groundwater samples.
- (4) The deepest depth of sampling should be at groundwater table or 6m bgl, whichever is shallower. Groundwater sample would only be collected if encountered.
- (5) The existing transformer house was inaccessible for site walkover at the time of reporting. The potential hotspot area (e.g. transformer) and the proposed sampling location within the transformer house should be reviewed when access is available for site re-appraisal at a later stage of the Project.

Table 4.2 Preliminary Sampling and Testing Plan for Southern Portion of Proposed HSKEPP

Potentially Contaminated Site ID ⁽¹⁾	Suspected Current / Historical Potentially Contaminating Land Use ⁽²⁾	Approx. Site Area (m ²)	Approx. Encroached Area (m ²)	Potential COCs ⁽³⁾	Recommended Minimum Number of Sampling Locations (Based on Area Within the Proposed HSKEPP Site) ⁽⁴⁾
C80a	Warehouse / container storage / open area storage / recycling facility	9,080	8,010	Metals (Full List), VOCs (Full List), SVOCs (Full List), PCRs and PCBs	28
C80b	Warehouse / construction material storage / equipment depot	17,180	16,150	Metals (Full List), VOCs (Full List), SVOCs (Full List) and PCRs	29
C81	Warehouse / container storage / construction material storage	25,640	7,680	Metals (Full List), VOCs (Full List), SVOCs (Full List) and PCRs	27
C84	Warehouse	1,020	860	Metals (Full List), VOCs (Full List), SVOCs (Full List) and PCRs	5
C85	Warehouse	6,000	1,070	Metals (Full List), VOCs (Full List), SVOCs (Full List) and PCRs	6
C85a_2021	Open area storage	1,680	1,040	Metals (Full List), VOCs (Full List), SVOCs (Full List) and PCRs	6

Note:

- (1) Refer to **Figure 3.1** for locations of the identified potentially contaminated sites.
- (2) Due to limited site access and only peripheral site inspections were carried out at the time of site walkover and the HSK NDA EIA study, the land use may be subject to change after site re-appraisal when the site is accessible.
- (3) The potential COCs are based on findings of the HSK NDA EIA Study and will be confirmed after the site is accessible for re-appraisal.
 - (i) Full list refers to the parameters as shown in Table 2.1 – Risk-Based Remediation Goals (RBRGs) for Soil & Soil Saturation Limit and Table 2.2 – RBRGs for Groundwater and Solubility Limit under Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), metals and Petroleum Carbon Ranges (PCRs) in the Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management.
 - (ii) PCBs refer to polychlorinated biphenyls.
 - (iii) Since RBRG value for metals except for Mercury, 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 said parameters would not be tested in groundwater samples.
- (4) The recommended minimum number of sampling locations were based on the area encroached into the proposed HSKEPP site and Table 2.1 of the Practice Guide. For potentially contaminated sites that only partially encroached into the proposed HSKEPP site, the minimum number of sampling locations should be reviewed if the SI works within and outside the proposed HSKEPP site are to be conducted together (e.g. similar to the minimum number of sampling locations recommended in the HSK NDA EIA Study). The actual number of sampling locations will be subject to the findings of the site re-appraisal when the site is accessible.

4.2 Soil Sampling Method and Depth of Sampling

- 4.2.1.1 The actual sampling and testing requirements for the SI works should be confirmed at the time of site re-appraisal when the potentially contaminated sites are accessible. The general sampling and testing strategy are discussed below.
- 4.2.1.2 All soil boring / excavation and sampling should be supervised by a land contamination specialist.
- 4.2.1.3 Boreholes should be undertaken by means of dry rotary drilling method (without the use of flushing medium to prevent cross-contamination during sampling). For safety reasons, an inspection pit should be excavated down to 1.5 m below ground level (bgl) to inspect for underground utilities at the proposed borehole location. Disturbed soil samples should be collected at 0.5 m bgl, using stainless steel hand tools or other appropriate equipment. Soil boring using drill rigs should then be performed from depth of 1.5 m to the maximum boring depth. Undisturbed U100 / U76 soil samples should be collected at depths of 1.5 m bgl, 3.0 m bgl and at 3.0 m interval afterwards. The termination depth of sampling should be of 2 m below the groundwater table or 6.0 m bgl, whichever is shallower. The appropriate depths of sampling at each sampling location will be determined by the on-site land contamination specialist subject to the actual site conditions.
- 4.2.1.4 At each sampling location/depth, sufficient quantity of soil sample (as specified by the laboratory) should be taken. All soil samples should be uniquely labelled. Backup samples should be retained and stored at temperature of 0 – 4 °C in laboratory.

4.3 Strata Logging

- 4.3.1.1 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.

4.4 Groundwater Sampling and Free Product Measurement

- 4.4.1.1 Groundwater samples should be collected at each of the sampling location if groundwater is encountered.
- 4.4.1.2 At each borehole location, a groundwater monitoring well should be installed. A typical design of a groundwater monitoring well is shown in **Appendix G**. 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. Well developments (approximately five well volumes) should be carried out to remove silt and drilling fluid residue from the wells. The wells should then be allowed to stand for a day to permit groundwater conditions to equilibrate.
- 4.4.1.3 Groundwater level and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken. In the unlikely event that measurable thicknesses of free product are encountered, a sample should be collected for laboratory analysis to determine the composition.
- 4.4.1.4 Prior to groundwater sampling, the monitoring wells should be purged (i.e. at least three well volumes) to remove fine-grained materials and to collect representative fresh groundwater samples.
- 4.4.1.5 After purging, one groundwater sample should be collected at each well using Teflon bailer and decanted immediately into appropriate sample containers in a manner that

minimises agitation and volatilisation 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 Teflon-lined cap. All samples should be uniquely labelled.

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

4.5 Sample Size and Decontamination Procedures

- 4.5.1.1 All down hole or digging equipment in contact with the ground should be thoroughly decontaminated between each sampling event to minimise the potential for cross contamination. The equipment (including drilling pit, digging tools and soil/groundwater samplers) should be decontaminated by steam cleaning, then washing with phosphate-free detergent and finally rinsed with distilled / deionised water.
- 4.5.1.2 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.
- 4.5.1.3 The sample containers should be laboratory cleaned, sealable, water-tight, made of glass or other suitable materials with 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.
- 4.5.1.4 The containers should be labelled with information such as sampling date / time, sampling location, the depths at which the samples were taken. If the contents are hazardous, this should be clearly marked on the container and precautions should be taken during transportation. Samples should be stored at 0 - 4°C 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.

4.6 Quality Assurance / Quality Control (QA/QC) Procedures

- 4.6.1.1 QA/QC samples should be collected in the following frequency during the SI works. Chain-of-Custody protocol should be adopted. Chain-of-Custody documentation should be prepared to document sample handling and transport procedures from the point of collection at the site to the laboratory and with instructions for the laboratory analysis on the collected samples.
- 1 duplicate per 20 samples;
 - 1 equipment blank per 20 samples;
 - 1 field blank per 20 samples; and
 - 1 trip blank per trip for the analysis of volatile parameters (i.e. VOCs and C6-C8).

4.7 Health and Safety

- 4.7.1.1 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 SI.
- 4.7.1.2 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.
- 4.7.1.3 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.
- 4.7.1.4 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) Ensure appropriate Personal Protective Equipment (e.g. safety helmet and protective boots) are worn by workers and site staff. If necessary, respirator and gloves should be worn for vapour exposure protection.

4.8 Laboratory Analysis

- 4.8.1.1 **Table 4.3** 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 4.3 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		NA	NA

Item	Parameter	Soil		Groundwater	
		Reporting Limit (mg/kg) or otherwise specified	Reference Method*	Reporting Limit (µg/L) or otherwise specified	Reference Method*
34	Arsenic	1	USEPA 6020	NA	NA
35	Barium	1		NA	NA
36	Cadmium	0.2		NA	NA
37	Chromium III [^]	1	By calculation	NA	NA
38	Chromium VI	1	USEPA 3060 APHA 3500 CR:D	NA	NA
39	Cobalt	1	USEPA 6020	NA	NA
40	Copper	1		NA	NA
41	Lead	1		NA	NA
42	Manganese	1		NA	NA
43	Mercury	0.05	APHA 3112B	0.5	APHA 3112B
44	Molybdenum	1	USEPA 6020	NA	NA
45	Nickel	1		NA	
46	Tin	1		NA	
47	Zinc	1		NA	
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.

4.8.1.2 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.

4.8.1.3 If contamination is identified and landfill disposal of contaminated soil is considered necessary as the last resort, three impacted soil samples shall be subject to Toxicity Characteristic Leaching Procedure (TCLP) testing to determine whether they comply with the Landfill Disposal Criteria for Contaminated Soil in accordance with the Practice Guide for landfill disposal.

5 INITIAL EVALUATION OF POTENTIAL LAND CONTAMINATION IMPACT AND POSSIBLE REMEDIATION MEASURES

5.1 Initial Evaluation of Potential Land Contamination Impact

5.1.1.1 Based on findings of the HSK NDA EIA Study and the site appraisal under this CAP, 4 facilities / areas with land contamination concern were identified within the northern portion of HSKEPP (SWPTW) and 6 potentially contaminated sites were identified within the southern portion of proposed HSKEPP.

5.1.1.2 For the northern portion of the proposed HSKEPP (SWPTW), the potential land contamination concerns were associated with handling and storage of chemicals or petroleum products. The sizes of the identified hotspots (ranged from 1 m² to 25 m²) were considered small and all the handling and storage activities of chemicals or petroleum products were carried out on paved concrete floor. For the southern portion of the proposed HSKEPP, it was suspected that the identified potentially contaminated sites are mostly used for storage (e.g. open area storage, container storage, warehouse and construction material storage). The majority of storage sites are usually kept for the storage of goods, whilst only a small portion of the site may be used for potentially contaminating activities such as vehicle / equipment maintenance and the associated chemical handling/storage. In addition, as reported by EPD and FSD, there are no records of spillage / leakage accidents of chemicals / chemical wastes within the proposed HSKEPP. As such, the contamination extent, if any, caused by the operations of the concerned areas is anticipated to be localized. Furthermore, the COCs identified included metals, VOCs, SVOCs, PCRs and PCBs, which are readily treatable using established techniques and have been effectively remediated in Hong Kong using proven remediation techniques.

5.1.1.3 All the concerned areas were inaccessible for detailed site walkover or SI works. In addition, as the proposed HSKEPP site are still in use, there could be change in land use or additional hotspots within the concerned areas or other areas within the proposed HSKEPP site prior to development. Similar to the HSK NDA EIA Study, further works including site re-appraisal for the entire proposed HSKEPP site, SI works and if necessary remediation works are recommended to be carried out for the concerned sites prior to the construction of the proposed HSKEPP. Details of the recommended further works are discussed in **Section 6**.

5.1.1.4 If the recommended further works were properly implemented, any contaminated soil and groundwater within the proposed HSKEPP site would be properly identified and treated using appropriate remediation methods and according to EPD's approved Remediation Action Plan (RAP) prior to the construction works. Hence, no potential land contamination impact is anticipated during construction and operation phase of the Project.

5.1.1.5 Given the above and similar to the findings of the HSK NDA EIA Study, the land contamination issues in the identified potentially contaminated sites would not be considered as insurmountable.

5.2 Possible Remediation Measures

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

5.2.1.2 Nevertheless, the potential COCs may include metals, VOCs, SVOCs, PCRs and PCBs. For contaminated soil, there are a number of technologies commercially available to tackle the identified COCs and are presented in the Practice Guide. Technologies that are commonly used in Hong Kong are biopiling and cement

solidification/stabilisation. These ex-situ methods were proven to be effective in treating the target COCs and the treated soil could then be reused on site (e.g. backfilling materials). For groundwater, there are remediation techniques as shown in EPD's Practice Guide (e.g. air sparging, recovery trenches / wells, in-ground containment/capping and permeable reactive barriers) that could be applied if contaminated groundwater were identified.

6 FURTHER WORKS AND TENTATIVE PROGRAMME SCHEDULE

- 6.1.1.1 Similar to the HSK NDA EIA Study, the identified concerned areas were inaccessible for detailed site walkover or SI works and were still in operation. In addition, there might be change in land use prior to development which could result in further land contamination issues. Therefore, site re-appraisal should be conducted for the identified concerned areas prior to development of the sites in order to update findings of the site appraisal (e.g. change in land use and additional hotspots) and the sampling and testing requirements for SI works. In addition, re-appraisal would be required for the other remaining areas of the proposed HSKEPP site in order to assess the latest land uses and site conditions. Supplementary CAP(s), incorporating findings of the site re-appraisal for the entire proposed HSKEPP site and the updated sampling and testing strategy, should be prepared and submitted to EPD for approval prior to conducting any SI works.
- 6.1.1.2 SI works should then be carried out according to the EPD approved supplementary CAP(s). After completion of the SI works, CAR(s) should be prepared to present findings of the SI works. If contamination has been identified, RAP(s) should be prepared to recommend specific remediation measures and submitted to EPD for approval. Any contaminated soil and groundwater should be treated according to the EPD approved RAP(s) and Remediation Report(s) (RR(s)) would also be prepared to demonstrate that the clean-up works are adequate and should be submitted to EPD for approval after completion of the remediation works. No development works shall be commenced prior to EPD's agreement of the RR.
- 6.1.1.3 For the northern portion of the proposed HSKEPP, based on the latest construction programme, demolition of the existing SWPTW is anticipated to be carried out from Q1 to Q3 of 2027 under the Project. The tentative schedule for the corresponding land contamination assessment under the Project is shown in **Table 6.1** below. For the southern portion of the proposed HSKEPP, as discussed in **Section 2.1.1.2**, the site formation works (including any decontamination works) will be undertaken by CEDD separately under the HSK NDA project prior to the construction of the proposed HSKEPP. The schedule for the corresponding land contamination assessment (including the submission of supplementary CAP, CAR and if necessary, RAP and RR) will be subject to the works programme of the HSK NDA project by CEDD.

Table 6.1 Tentative Schedule for Land Contamination Assessment (Northern Portion of Proposed HSKEPP Site)

Task	Tentative Timeframe
Site re-appraisal, preparation and submission of supplementary CAP	Q4 of 2026
Approval of supplementary CAP	Q1 of 2027
SI works, laboratory tests, preparation and submission of CAR/RAP	Q3-Q4 of 2027
Approval of CAR/RAP	Q4 of 2027
Remediation works, preparation and submission of RR	Subject to results of the SI works

7 CONCLUSION

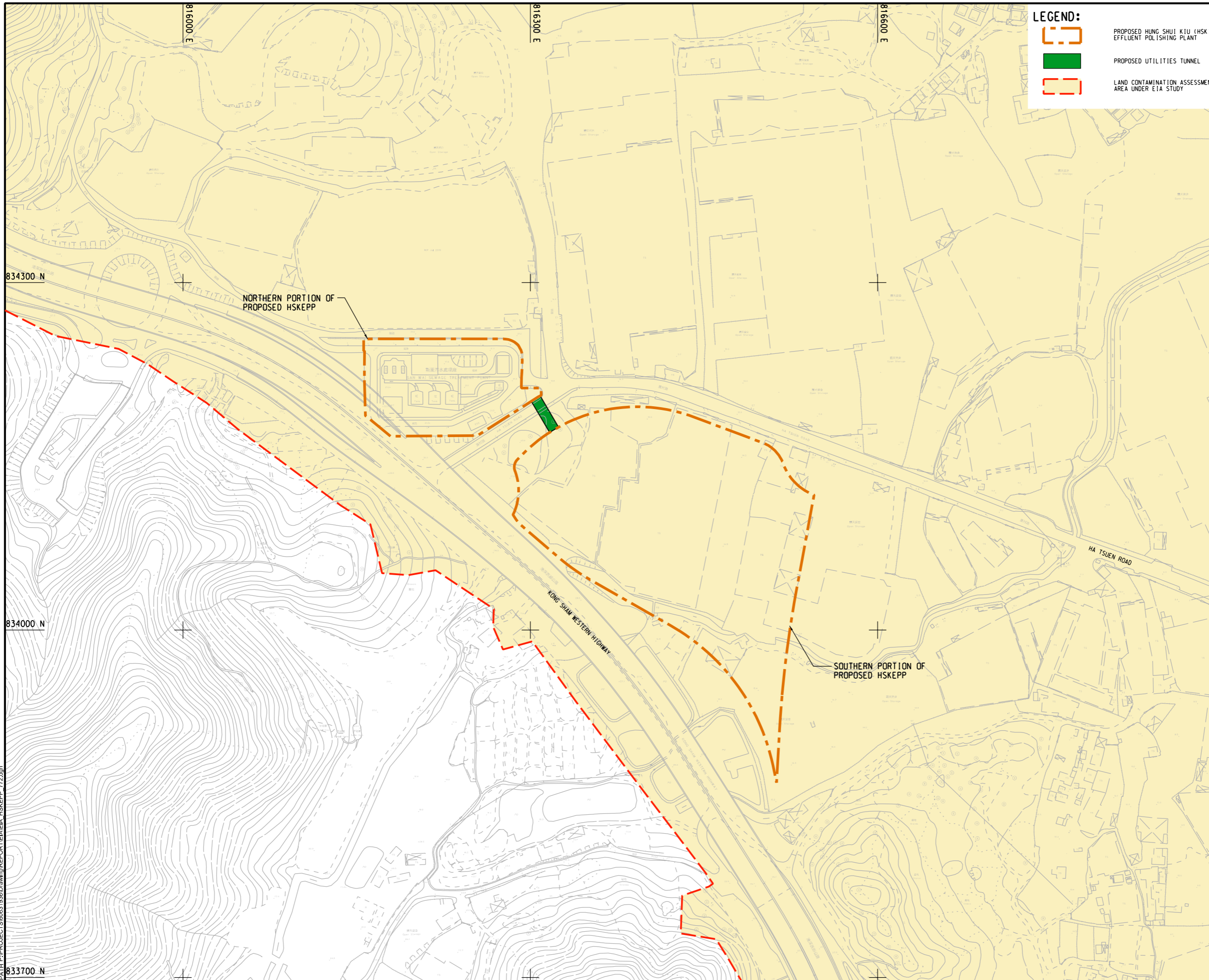
- 7.1.1.1 This CAP covered the proposed HSKEPP site and is prepared for the EIA Study.
- 7.1.1.2 A site appraisal, including the review of the HSK NDA EIA Study, desktop review and site walkover, was conducted from August 2020 to September 2021 to identify any current/historical potentially contaminating land uses within the proposed HSKEPP site. Based on the site appraisal findings, 4 facilities / areas with land contamination concern within the northern portion of HSKEPP (SWPTW) and 6 potentially contaminated sites within the southern portion of HSKEPP were identified.
- 7.1.1.3 Similar to the HSK NDA EIA Study, the identified concerned areas were inaccessible for detailed site walkover or SI works and were still in operation. In addition, there might be change in land use prior to development which could result in further land contamination issues. Therefore, site re-appraisal should be conducted for the identified concerned areas prior to development of the sites in order to update findings of the site appraisal (e.g. locations of hotspots) and the sampling and testing requirements for SI works. In addition, re-appraisal would be required for the other remaining areas of the proposed HSKEPP site in order to assess the latest land uses and site conditions. Supplementary CAP(s), incorporating findings of the site re-appraisal for the entire proposed HSKEPP site and the updated sampling and testing strategy, should be prepared and submitted to EPD for approval prior to conducting any SI works.
- 7.1.1.4 SI works should then be carried out according to the EPD approved supplementary CAP(s). After completion of the SI works, CAR(s) should be prepared to present findings of the SI works. If contamination has been identified, RAP(s) should be prepared to recommend specific remediation measures and submitted to EPD for approval. Any contaminated soil and groundwater should be treated according to the EPD approved RAP(s) and Remediation Report(s) (RR(s)) would also be prepared to demonstrate that the clean-up works are adequate and should be submitted to EPD for approval after completion of the remediation works. No development works shall be commenced prior to EPD's agreement of the RR.
- 7.1.1.5 With the implementation of the recommended further works for the Project, any soil/groundwater contamination associated with past or present contaminating land uses would be identified and properly treated prior to the construction works. No insurmountable land contamination impacts to the Project are anticipated.

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Figures

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LEGEND:

- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- PROPOSED UTILITIES TUNNEL
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



PROJECT
 項目
HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

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 項目編號
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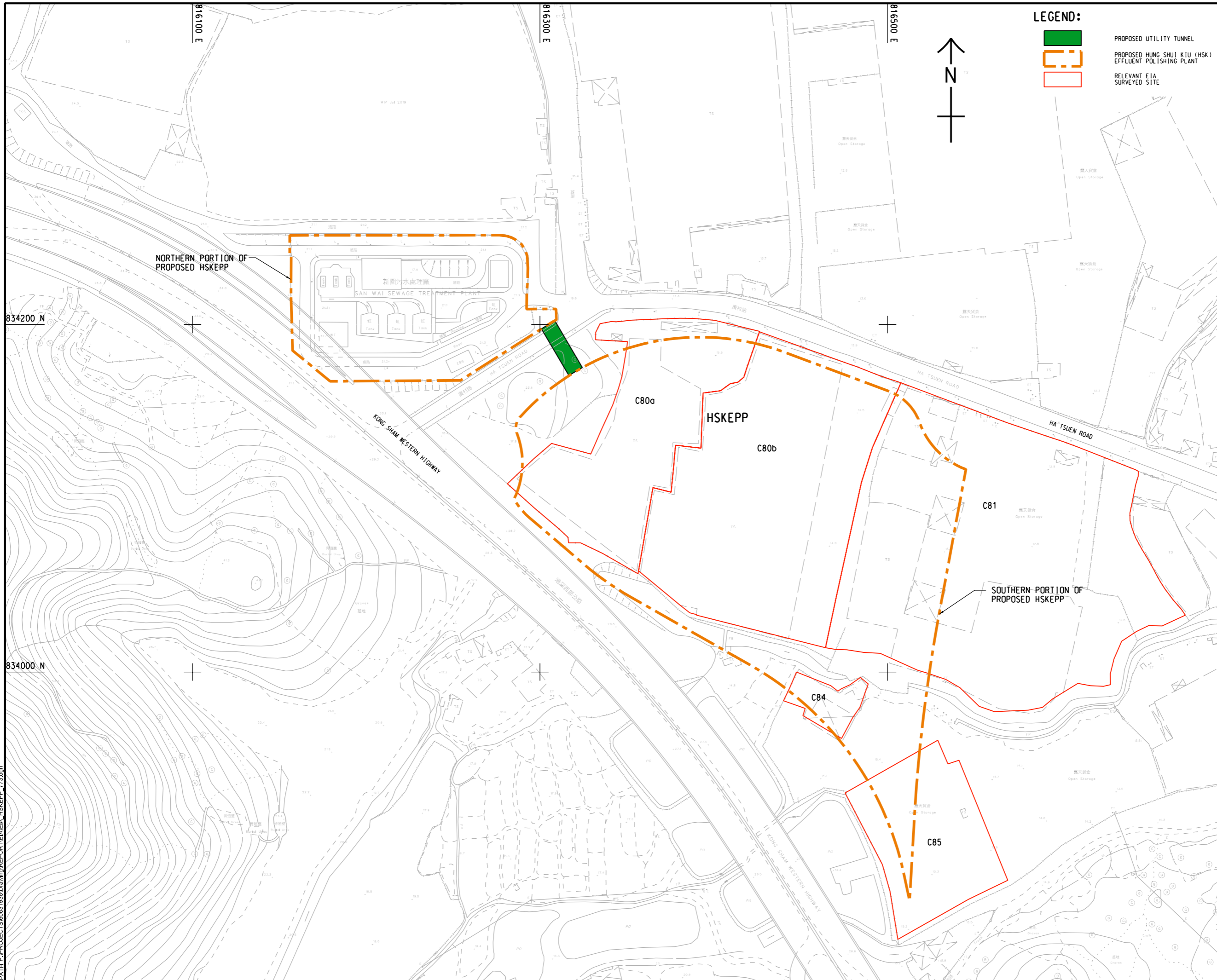
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 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 LOCATION PLAN OF HSKEPP AND LAND CONTAMINATION ASSESSMENT AREA UNDER HSK NDA EIA STUDY

SHEET NUMBER
 圖紙編號
 60631936/EIA/HSKEPP/CAP/FIGURE 1.1

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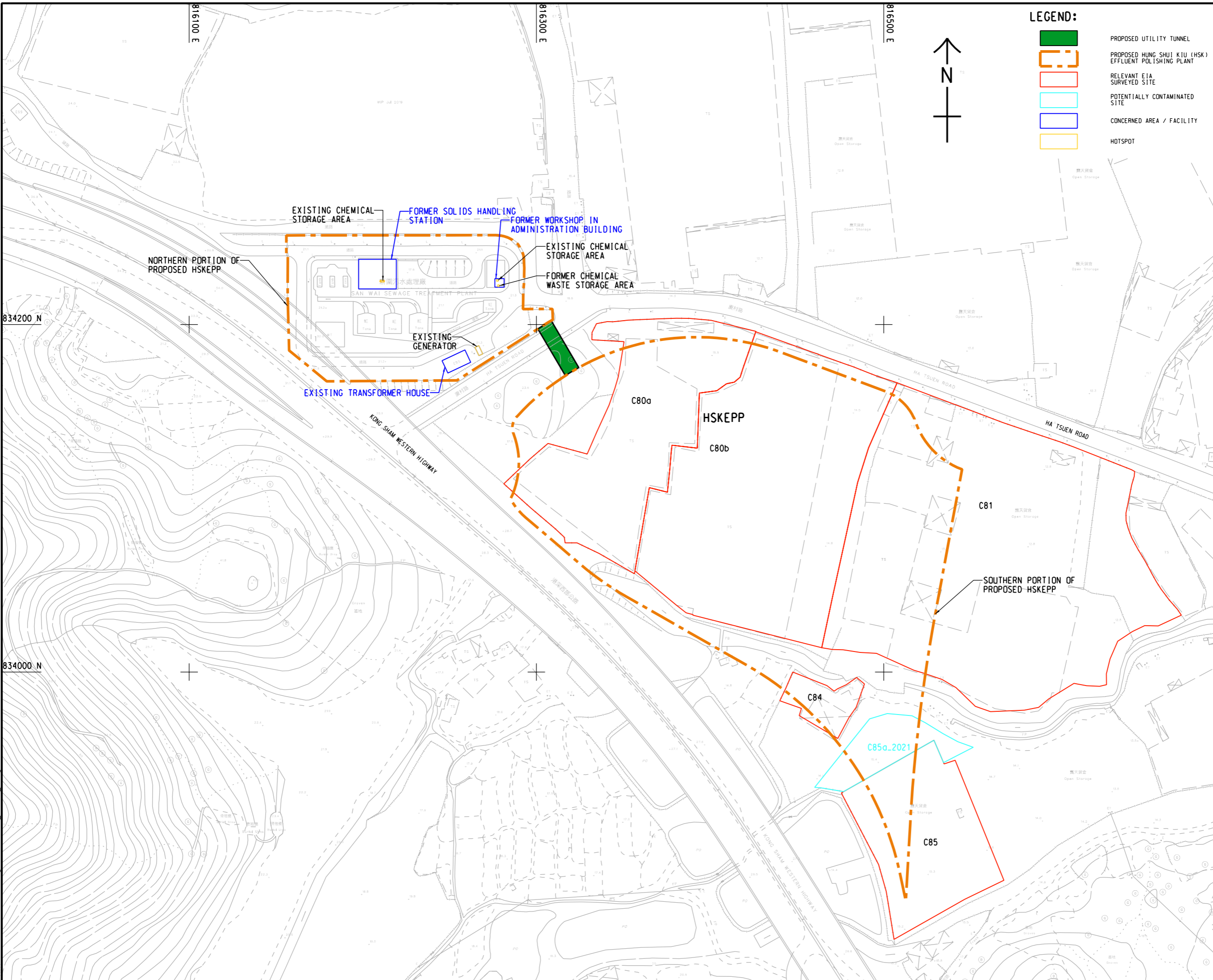
SHEET TITLE
 PROJECT LAYOUT PLAN AND
 RELEVANT EIA SURVEYED SITES

SHEET NUMBER
 60631936/EIA/HSKEPP/CAP/FIGURE 2.1

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 834000 N
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LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- POTENTIALLY CONTAMINATED SITE
- CONCERNED AREA / FACILITY
- HOTSPOT

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SHEET TITLE
 LOCATIONS OF IDENTIFIED POTENTIALLY CONTAMINATED SITES / HOTSPOTS

SHEET NUMBER
 60631936/EIA/HSKPEPP/CAP/FIGURE 3.1







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WIP Jul 2019

NOTE:

1. THE EXISTING TRANSFORMER HOUSE (SWENV-BH06) WAS INACCESSIBLE FOR SITE WALKOVER AT THE TIME OF REPORTING. THE POTENTIAL HOTSPOT AREA (E.G. TRANSFORMER) AND THE PROPOSED SAMPLING LOCATION WITHIN THE TRANSFORMER HOUSE SHOULD BE REVIEWED WHEN ACCESS IS AVAILABLE FOR SITE RE-APPRAISAL AT A LATER STAGE OF THE PROJECT.

LEGEND:

-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  PROPOSED UTILITY TUNNEL
-  CONCERNED AREA / FACILITY
-  HOTSPOT
-  RELEVANT EIA SURVEYED SITE
-  SWENV-BH01 PROPOSED SAMPLING LOCATION



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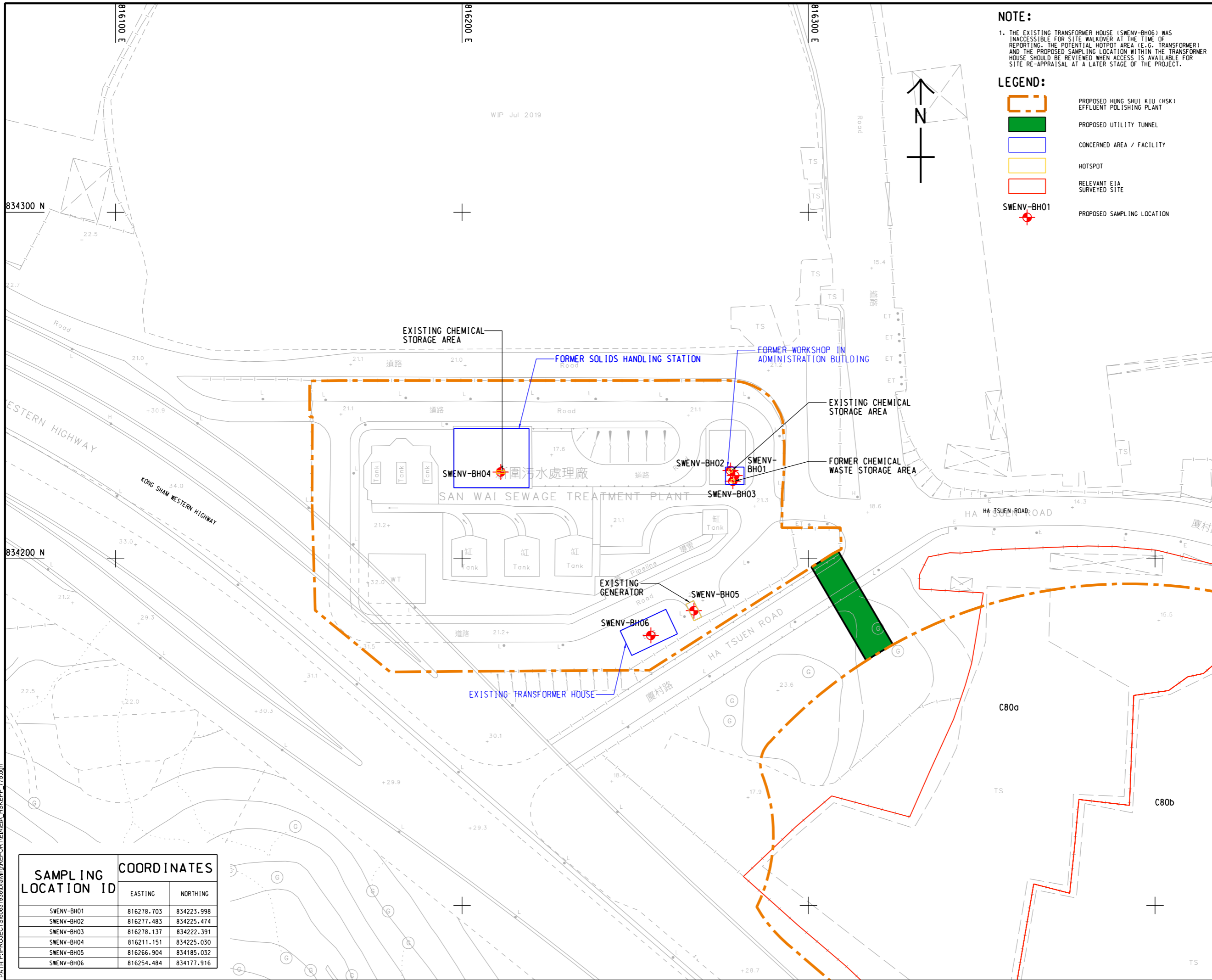
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SHEET TITLE

CONCERNED AREAS AND
 PROPOSED SAMPLING LOCATIONS
 (NORTHERN PORTION OF
 PROPOSED HSKEPP)

SHEET NUMBER

60631936/EIA/HSKEPP/CAP/FIGURE 4.1



SAMPLING LOCATION ID	COORDINATES	
	EASTING	NORTHING
SWENV-BH01	816278.703	834223.998
SWENV-BH02	816277.483	834225.474
SWENV-BH03	816278.137	834222.391
SWENV-BH04	816211.151	834225.030
SWENV-BH05	816266.904	834185.032
SWENV-BH06	816254.484	834177.916

Appendix A





Relevant Historical Aerial Photographs

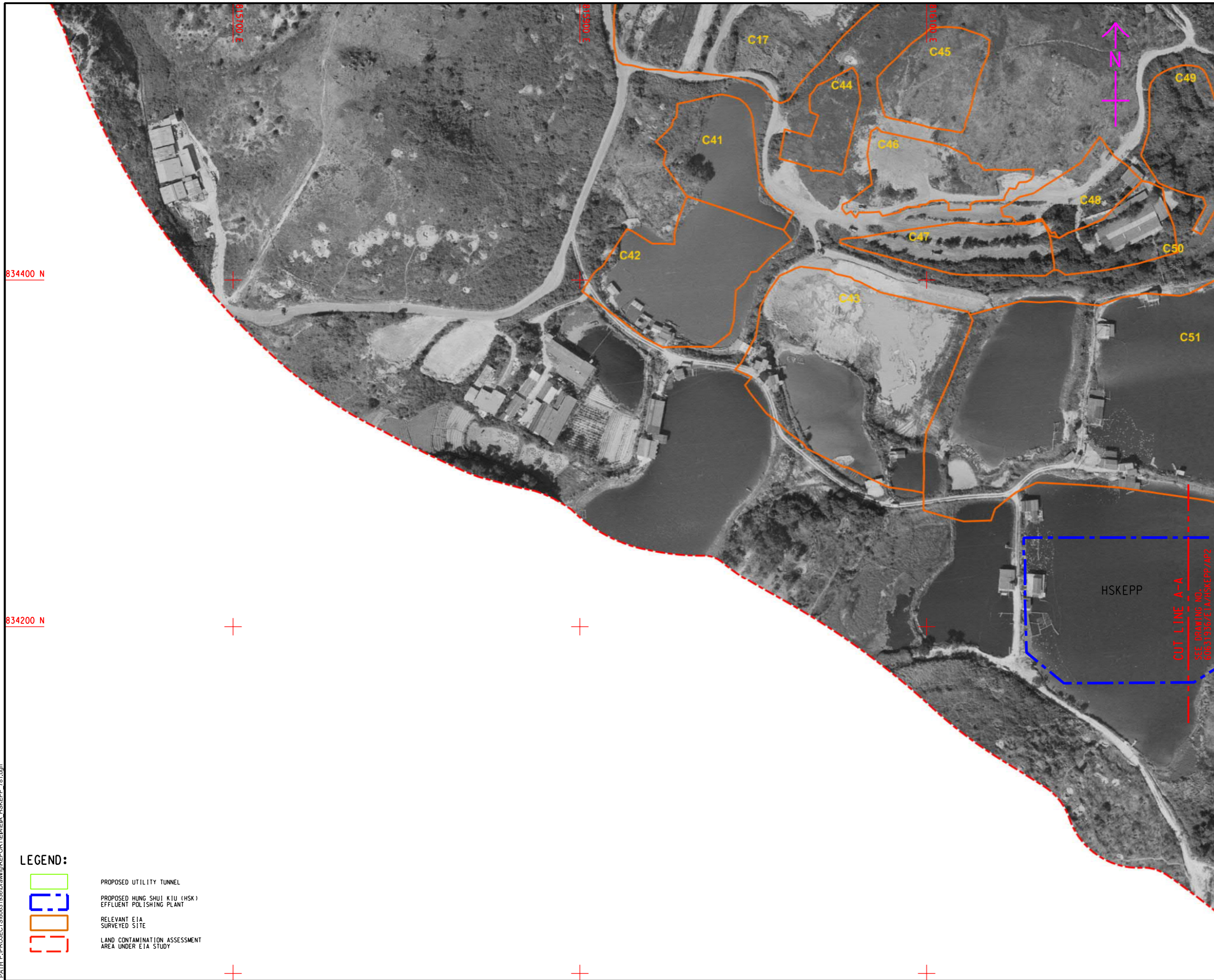
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834400 N

834200 N

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



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834000 N

833800 N

833600 N



CUT LINE B-B

SEE DRAWING NO.
60631936/EIA/HSKEPP/AP2

HSKEPP

C84

C85

C86

C81

C69

C70

C71

C104

C105





C106

C107

C108

C121

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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SHEET NUMBER
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- LEGEND:**
- PROPOSED UTILITY TUNNEL
 - PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
 - RELEVANT EIA SURVEYED SITE
 - LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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- RELEVANT EIA SURVEYED SITE
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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PROJECT
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834000 N





833800 N

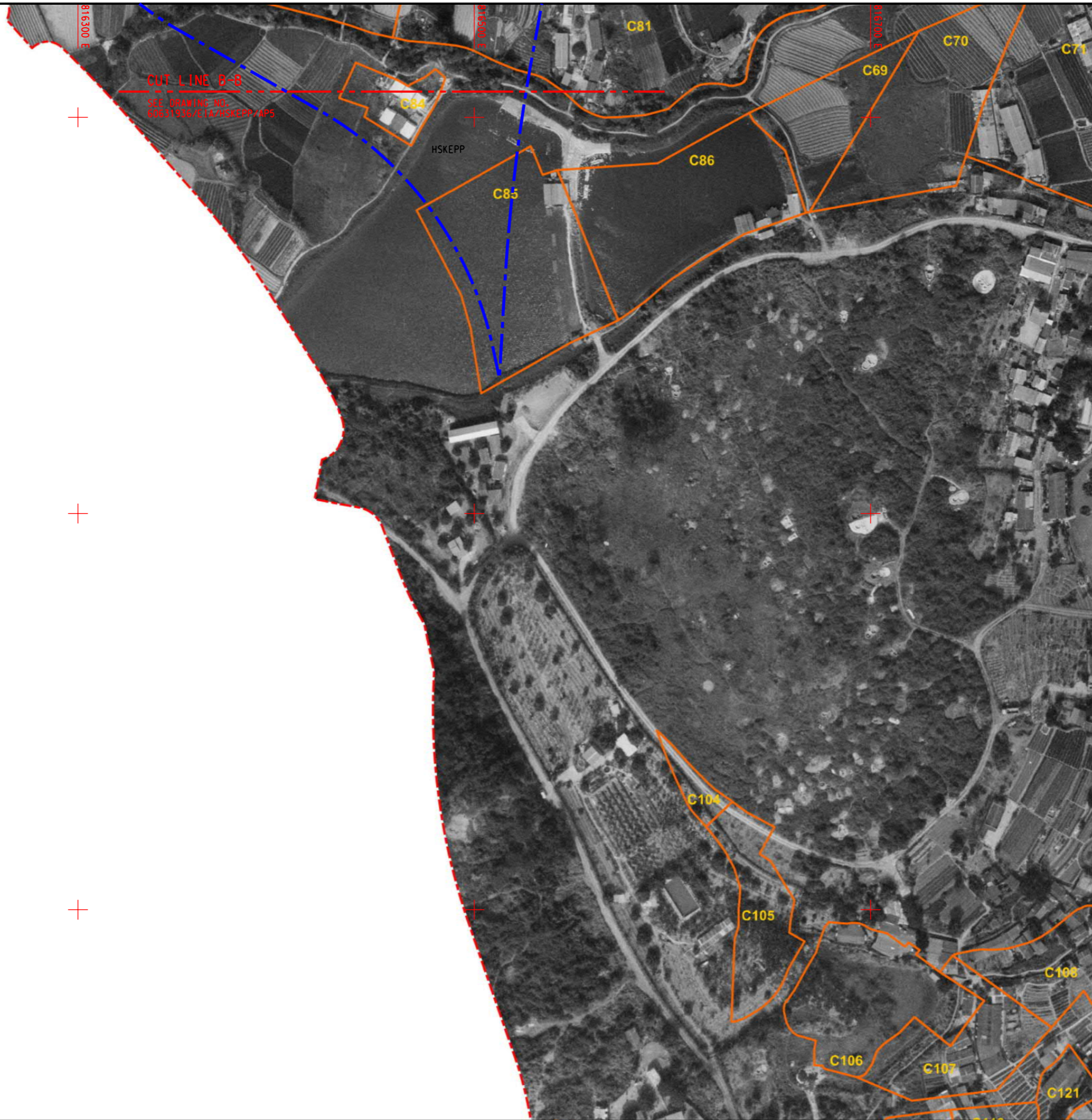
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CUT LINE B-B
 SEE DRAWING NO.
 60631936/EIA/HSKEPP/AP5

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



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- LEGEND:**
- PROPOSED UTILITY TUNNEL
 - PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
 - RELEVANT EIA SURVEYED SITE
 - LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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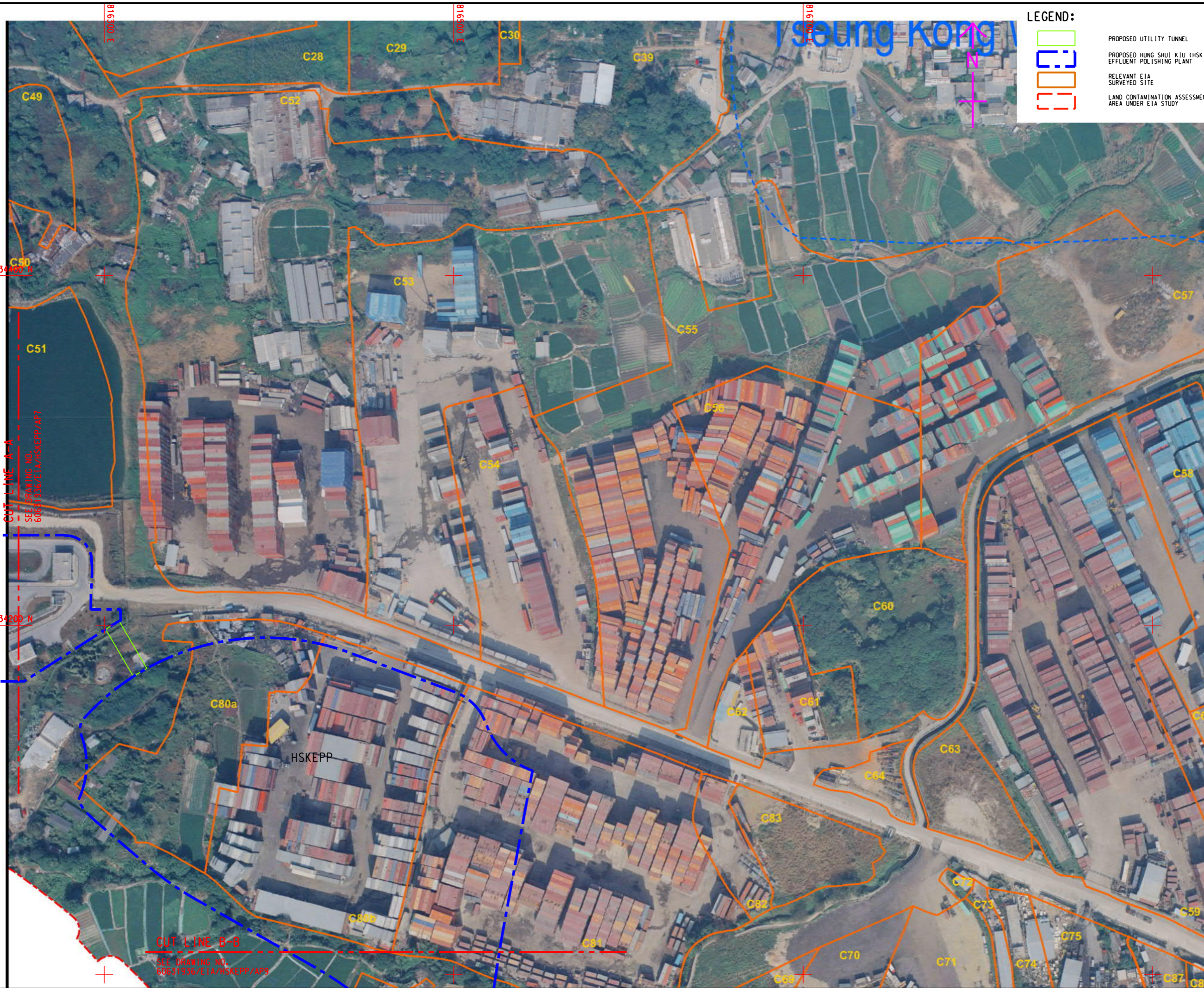
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LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



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834000 N





833800 N

833600 N



CUT LINE B-B
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LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



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A1 1 : 1000 METRES

KEY PLAN

PROJECT NO. **CONTRACT NO.**

60631936 CE 6/2019 (DS)

SHEET TITLE

AERIAL PHOTOPGRAPH 1995

SHEET NUMBER





60631936/EIA/HSKEPP/AP9

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834400 N

834200 N

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



PROJECT
 項目
HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

CLIENT
 業主
 **渠務署**
Drainage Services Department

CONSULTANT
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 修訂

NO.	DATE	DESCRIPTION	CHK.

STATUS
 狀況

SCALE
 比例
 A1 1: 1000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60631936

CONTRACT NO.
 合約編號
 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 AERIAL PHOTOPGRAPH 2010

SHEET NUMBER
 圖紙編號
 60631936/EIA/HSKEPP/AP10

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SAN WAI PRELIMINARY TREATMENT WORKS

HSKEPP

CUT LINE A-A
 SEE DRAWING NO. 60631936/EIA/HSKEPP/AP10

Kwai Chung Highway



LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

AECOM

PROJECT
HUNG SHUI KIU
EFFLUENT POLISHING
PLANT AND
YUEN LONG SOUTH
EFFLUENT POLISHING
PLANT - INVESTIGATION

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STATUS

SCALE **DIMENSION UNIT**
A1 1 : 1000 METRES

KEY PLAN

PROJECT NO. **CONTRACT NO.**
60631936 CE 6/2019 (DS)

SHEET TITLE
AERIAL PHOTOPGRAPH 2010

SHEET NUMBER
60631936/EIA/HSKEPP/AP11

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834000 N

833800 N





833600 N



CUT LINE B-B

SEE DRAWING NO.
60631936/EIA/HSKEPP/AP11

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY



PROJECT

HUNG SHUI KIU
 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
 EFFLUENT POLISHING
 PLANT - INVESTIGATION

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STATUS

SCALE **DIMENSION UNIT**

A1 1 : 1000 METRES

KEY PLAN

PROJECT NO. **CONTRACT NO.**

60631936 CE 6/2019 (DS)

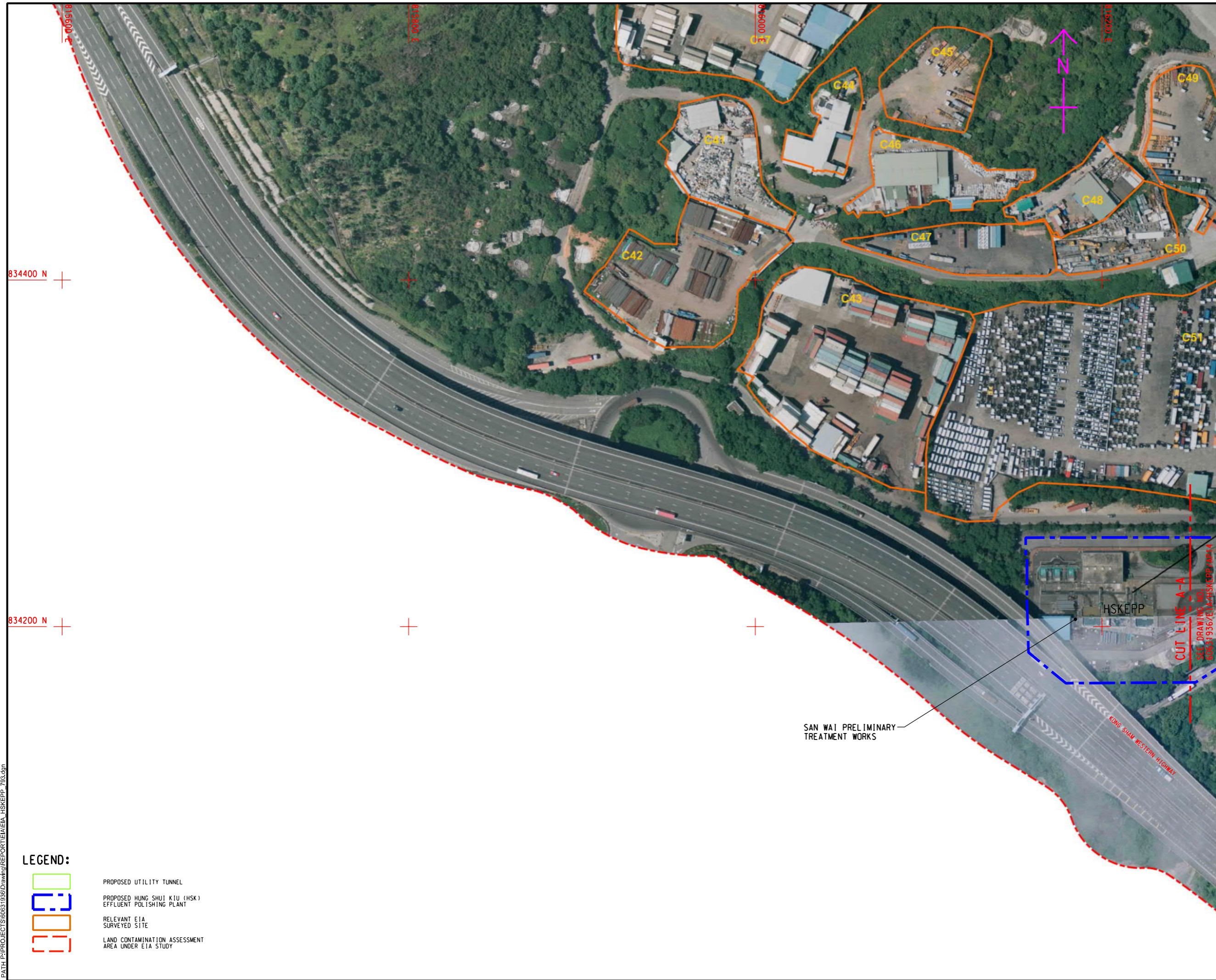
SHEET TITLE

AERIAL PHOTOPGRAPH 2010

SHEET NUMBER

60631936/EIA/HSKEPP/AP12

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- LEGEND:**
- PROPOSED UTILITY TUNNEL
 - PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
 - RELEVANT EIA SURVEYED SITE
 - LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

PROJECT
 項目
HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

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STATUS
 狀況

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A1 1: 1000 METRES

KEY PLAN
 索引圖

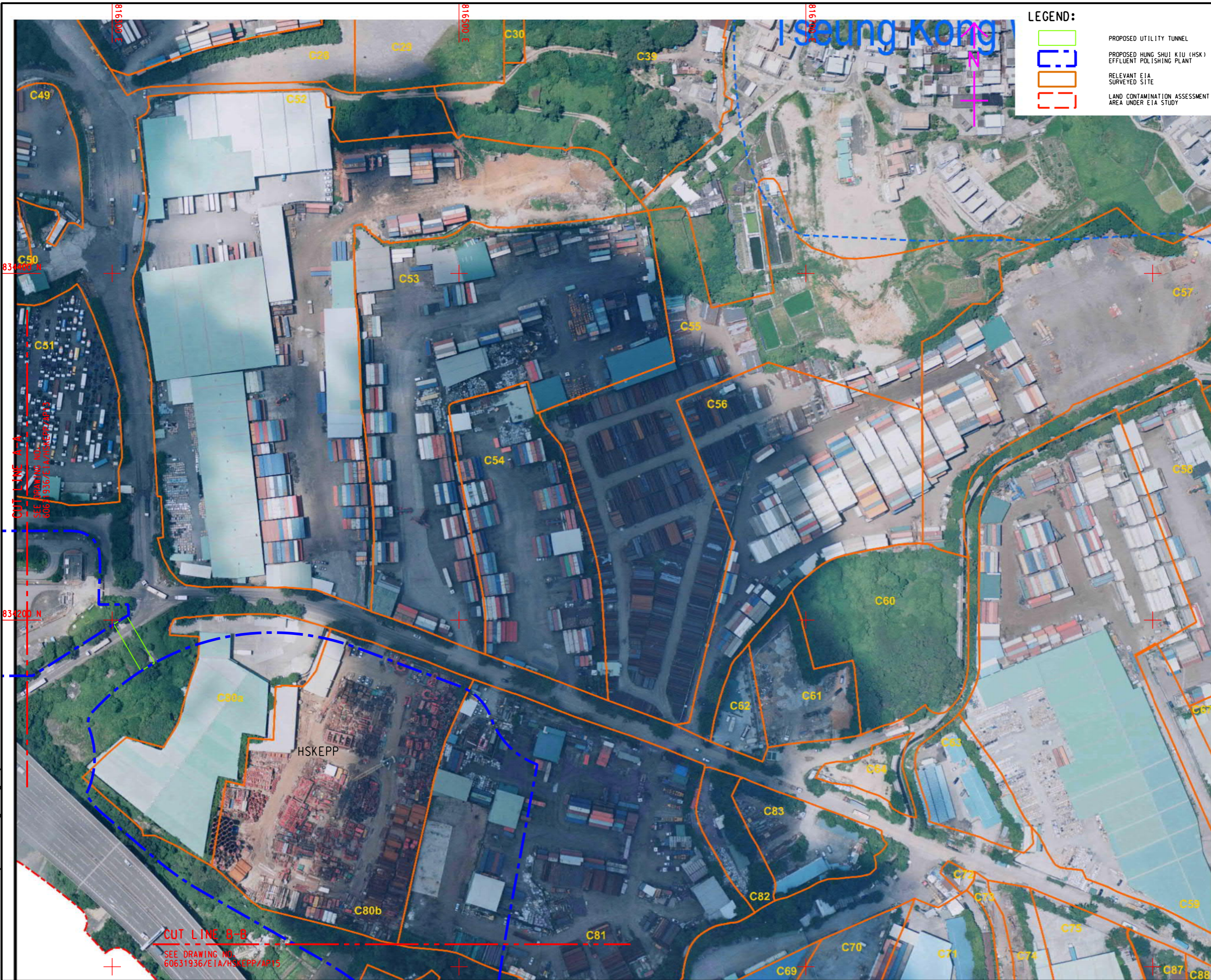
PROJECT NO. **CONTRACT NO.**
 項目編號 合約編號
 60631936 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 AERIAL PHOTOGRAPH 2013

SHEET NUMBER
 圖紙編號
 60631936/EIA/HSKPEPP/AP13

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ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:
 16/09/2021
 Plotted by: YaoFB
 PATH: P:\PROJECTS\60631936\Drawing\REPORT\EIA\HSKEPP_794.dgn



LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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PROJECT
 HUNG SHUI KIU
 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
 EFFLUENT POLISHING
 PLANT - INVESTIGATION

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SCALE **DIMENSION UNIT**
 A1 1 : 1000 METRES

KEY PLAN

PROJECT NO. **CONTRACT NO.**
 60631936 CE 6/2019 (DS)

SHEET TITLE
 AERIAL PHOTOPGRAPH 2013

SHEET NUMBER
 60631936/EIA/HSKEPP/AP14

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834000 N

833800 N

833600 N



CUT LINE B-B

SEE DRAWING NO.
60631936/EIA/HSKEPP/AP14

HSKEPP

C84

C85

C86

C69

C70

C71

C104

C105





C108

C106

C107

C121

LEGEND:

-  PROPOSED UTILITY TUNNEL
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  RELEVANT EIA SURVEYED SITE
-  LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY

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 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
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STATUS

SCALE: A1 1: 1000
 DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60631936
 CONTRACT NO.: CE 6/2019 (DS)

SHEET TITLE: AERIAL PHOTOPGRAPH 2013

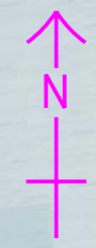
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LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- LAND CONTAMINATION ASSESSMENT AREA UNDER EIA STUDY
- POTENTIALLY CONTAMINATED SITE



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HUNG SHUI KIU
EFFLUENT POLISHING
PLANT AND
YUEN LONG SOUTH
EFFLUENT POLISHING
PLANT - INVESTIGATION

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SCALE
A1 1: 1000

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60631936

CONTRACT NO.
CE 6/2019 (DS)

SHEET TITLE
AERIAL PHOTOGRAPH 2020

SHEET NUMBER
60631936/EIA/HSKEPP/AP16

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Appendix B

Details of Relevant EIA Surveyed Sites (Extracted from HSK NDA EIA CAP)

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Site Background	
Company Name	Unknown
Site ID	C80a
Suspected Current Land Use / Activities	Warehouse
Approximate Area (m ²)	9,080
Locations	Southeast of San Wai Treatment Works

Desktop Review	
Review of Outline Zoning Plan	OS
Principal Rock Types / Characters on the Geological Survey Map	Qpa + Qpd + bt + JTU
Historical Land Use (Review of Historical Aerial Photos)	<ul style="list-style-type: none"> 1978: Green belt and cultivations are observed. 1985: Cultivations and village type housings are observed. 1995: Cultivations and recycling facility are observed. 2010: Container storage and open area storages are observed. 2013: A warehouse type structure is observed.
Reference of Historical Aerial Photos	Appendix A2 - Sheet 12 of 31
Lot No.	DD125 1231, 1243RP – 1245, 1279 – 1282, 1285 – 1292, 1294, 1295, 1352 – 1359 OSL
Land Ownership Status	Private

Site Reconnaissance Information and Recommendation	
Date of Survey	Dec-14
Conducted by	Eleanor Cunningham and Squall Lam
Site Observation	A warehouse was observed.
Potentially Contaminating Activities	<p><u>Current Activities and Information from FSD and EPD</u> Warehouses (No specific potentially contaminating activities were identified subject to further site re-appraisal)</p> <p>Based on FSD/EPD information, there were no DGs / incident / spillage records but an active chemical waste producer record for the site.</p> <p><u>Past Activities</u> Container Storage, Open Area Storage and Warehouse</p> <p>The possible contaminating activities may include loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.</p>
References of Photographs of Site Reconnaissance	Appendix E3 - Sheet 20 of 36
Recommended No. of Boreholes*	29
Recommended Grid Size in Practice Guide (in meters)*	18
Key Chemicals of Concern	Metals (full list), PCRs, VOCs and SVOCs.
Necessity for Further Site Investigation	Yes
Future Land Use	Road and Sewage Treatment Works
RBRGs	Industrial

Note: The recommended testing and sampling protocol (i.e. grid size, no. of boreholes and key COCs) is only tentative and is subject to be reviewed after the sites are resumed by the Project Proponent.

*Determination of the number of boreholes and grid size is based on EPD Practice Guide for Investigation and Remediation of Contaminated Land (PG) as summarized below:

Area of Site (m ²)	Grid Size	Min Number of Sampling Points
100	6	3
500	13	3
1,000	13	6
2,000	13	12
4,000	17	14
5,000	17	17
8,000	17	28
10,000	19	29
30,000	31	32
90,000	51	35

*TBC: To be confirmed. The current land uses are warehouse with no other historical potentially contaminated land uses identified. The presence and degree of contamination would greatly depend on the types of goods stored. For example, warehouses that stored general household goods (e.g. furniture and toys) are unlikely to cause contamination to the underlying soil and groundwater. A site re-appraisal within these sites are therefore required at the later stage of the development to (i) assess the nature of these warehouses and site conditions, (ii) confirm the necessity for site investigation works and, if required, (iii) formulate the sampling and testing strategies.

Site Background	
Company Name	法國地基建業公司
Site ID	C80b
Suspected Current Land Use / Activities	Construction Material Storage and Equipment Depot
Approximate Area (m ²)	17,180
Locations	Southeast of San Wai Treatment Works

Desktop Review	
Review of Outline Zoning Plan	OS
Principal Rock Types / Characters on the Geological Survey Map	Qpa + Qpd + bt + JTU
Historical Land Use (Review of Historical Aerial Photos)	<ul style="list-style-type: none"> 1978: Cultivations are observed. 1985: No significant change in land use is observed in comparison with the land use from 1978 aerial photo. 1995: A container storage area is observed. 2010: A construction material storage and equipment depot are observed. 2013: No significant change in land use is observed in comparison with the land use from 2010 aerial photo.
Reference of Historical Aerial Photos	Appendix A2 - Sheets 12 and 16 of 31
Lot No.	DD125 1290 – 1293, 1295 – 1305RP, 1343 – 1351 OSL
Land Ownership Status	Private

Site Reconnaissance Information and Recommendation	
Date of Survey	Dec-14
Conducted by	Eleanor Cunningham and Squall Lam
Site Observation	Open area storage of construction material and equipment depot were observed.
Potentially Contaminating Activities	<p><u>Current Activities and Information from FSD and EPD</u> The possible contaminating activities may include release of oils and fuels and lubricants from vehicles, vehicle and equipment maintenance and refueling. Use of chemicals and solvents in maintenance activities. Motor vehicle painting and storage and disposal of wastes.</p> <p>Based on FSD/EPD information, there were no DGs / chemical wastes / incident / spillage records for the site.</p> <p><u>Past Activities</u> Container Storage and Equipment Depot</p> <p>The possible contaminating activities may include loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles, release of oils and fuels and lubricants from vehicles, vehicle and equipment maintenance and refueling the use of chemicals and solvents in maintenance activities. Motor vehicle painting and storage and disposal of wastes.</p>
References of Photographs of Site Reconnaissance	Appendix E3 - Sheet 20 of 36
Recommended No. of Boreholes*	30
Recommended Grid Size in Practice Guide (in meters)*	24
Key Chemicals of Concern	Metals (full list), PCRs, VOCs and SVOCs.
Necessity for Further Site Investigation	Yes
Future Land Use	Road and Sewage Treatment Works
RBRGs	Industrial

Note: The recommended testing and sampling protocol (i.e. grid size, no. of boreholes and key COCs) is only tentative and is subject to be reviewed after the sites are resumed by the Project Proponent.

*Determination of the number of boreholes and grid size is based on EPD Practice Guide for Investigation and Remediation of Contaminated Land (PG) as summarized below:

Area of Site (m ²)	Grid Size	Min Number of Sampling Points
100	6	3
500	13	3
1,000	13	6
2,000	13	12
4,000	17	14
5,000	17	17
8,000	17	28
10,000	19	29
30,000	31	32
90,000	51	35

*TBC: To be confirmed. The current land uses are warehouse with no other historical potentially contaminated land uses identified. The presence and degree of contamination would greatly depend on the types of goods stored. For example, warehouses that stored general household goods (e.g. furniture and toys) are unlikely to cause contamination to the underlying soil and groundwater. A site re-appraisal within these sites are therefore required at the later stage of the development to (i) assess the nature of these warehouses and site conditions, (ii) confirm the necessity for site investigation works and, if required, (iii) formulate the sampling and testing strategies.

Site Background	
Company Name	溢航貨運物流有限公司
Site ID	C81
Suspected Current Land Use / Activities	Container and Construction Material Storage
Approximate Area (m ²)	25,640
Locations	Southeast of San Wai Treatment Works

Desktop Review	
Review of Outline Zoning Plan	OS
Principal Rock Types / Characters on the Geological Survey Map	Qpa + Qpd + JTU
Historical Land Use (Review of Historical Aerial Photos)	<ul style="list-style-type: none"> 1978: Cultivations pond and village type housings are observed. 1985: No significant change in land use is observed in comparison with the land use from 1978 aerial photo. 1995: Container storage area dominated the site. 2010: Container storage and construction material storage areas are observed. 2013: No significant change in land use is observed in comparison with the land use from 2010 aerial photo.
Reference of Historical Aerial Photos	Appendix A2 - Sheet 12 and 16 of 31
Lot No.	DD125 1188RP, 1301 – 1303, 1305, 1321RP, 1322RP, 1325RP – 1344 OSL, STT 2156 STT
Land Ownership Status	Private

Site Reconnaissance Information and Recommendation	
Date of Survey	Dec-14
Conducted by	Eleanor Cunningham and Squall Lam
Site Observation	Container storage area and construction material storage were observed. The site was concrete paved.
Potentially Contaminating Activities	<p><u>Current Activities and Information from FSD and EPD</u> The possible contaminating activities may include loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.</p> <p>Based on FSD/EPD information, there were no DGs / incident / spillage records but an active chemical waste producer record for the site.</p>
	<p><u>Past Activities</u> No potentially contaminating activities were identified.</p>
References of Photographs of Site Reconnaissance	Appendix E3 - Sheet 20 of 36
Recommended No. of Boreholes*	31
Recommended Grid Size in Practice Guide (in meters)*	29
Key Chemicals of Concern	Metals (full list), PCRs, VOCs and SVOCs.
Necessity for Further Site Investigation	Yes
Future Land Use	Road, Logistics Facility and Sewage Treatment Works
RBRGs	Industrial

Note: The recommended testing and sampling protocol (i.e. grid size, no. of boreholes and key COCs) is only tentative and is subject to be reviewed after the sites are resumed by the Project Proponent.

*Determination of the number of boreholes and grid size is based on EPD Practice Guide for Investigation and Remediation of Contaminated Land (PG) as summarized below:

Area of Site (m ²)	Grid Size	Min Number of Sampling Points
100	6	3
500	13	3
1,000	13	6
2,000	13	12
4,000	17	14
5,000	17	17
8,000	17	28
10,000	19	29
30,000	31	32
90,000	51	35

*TBC: To be confirmed. The current land uses are warehouse with no other historical potentially contaminated land uses identified. The presence and degree of contamination would greatly depend on the types of goods stored. For example, warehouses that stored general household goods (e.g. furniture and toys) are unlikely to cause contamination to the underlying soil and groundwater. A site re-appraisal within these sites are therefore required at the later stage of the development to (i) assess the nature of these warehouses and site conditions, (ii) confirm the necessity for site investigation works and, if required, (iii) formulate the sampling and testing strategies.

Site Background	
Company Name	Unknown
Site ID	C84
Suspected Current Land Use / Activities	Warehouse
Approximate Area (m ²)	1,020
Locations	Southeast of San Wai Treatment Works

Desktop Review	
Review of Outline Zoning Plan	GB
Principal Rock Types / Characters on the Geological Survey Map	Qpa
Historical Land Use (Review of Historical Aerial Photos)	<ul style="list-style-type: none"> 1978: Cultivations are observed. 1985: Village type housings are observed. 1995: No significant change in land use is observed in comparison with the land use from 1985 aerial photo. 2010: Village type housings were demolished and the site was vacant. 2013: A warehouse type structure is observed.
Reference of Historical Aerial Photos	Appendix A2 - Sheet 16 of 31
Lot No.	DD125 1452RP, 1453 OSL
Land Ownership Status	Private

Site Reconnaissance Information and Recommendation	
Date of Survey	Dec-14
Conducted by	Eleanor Cunningham and Squall Lam
Site Observation	Warehouses were observed.
Potentially Contaminating Activities	<p><u>Current Activities and Information from FSD and EPD</u> Warehouses (No specific potentially contaminating activities were identified subject to further site re-appraisal)</p> <p>Based on FSD/EPD information, there were no DGs / chemical wastes / incident / spillage records for the site.</p>
	<p><u>Past Activities</u> No other potentially contaminating activities were identified.</p>
References of Photographs of Site Reconnaissance	Appendix E3 - Sheet 20 of 36
Recommended No. of Boreholes*	TBC^
Recommended Grid Size in Practice Guide (in meters)*	TBC^
Key Chemicals of Concern	TBC^
Necessity for Further Site Investigation	TBC^
Future Land Use	Road and Sewage Treatment Works
RBRGs	Industrial

Note: The recommended testing and sampling protocol (i.e. grid size, no. of boreholes and key COCs) is only tentative and is subject to be reviewed after the sites are resumed by the Project Proponent.

*Determination of the number of boreholes and grid size is based on EPD Practice Guide for Investigation and Remediation of Contaminated Land (PG) as summarized below:

Area of Site (m ²)	Grid Size	Min Number of Sampling Points
100	6	3
500	13	3
1,000	13	6
2,000	13	12
4,000	17	14
5,000	17	17
8,000	17	28
10,000	19	29
30,000	31	32
90,000	51	35

*TBC: To be confirmed. The current land uses are warehouse with no other historical potentially contaminated land uses identified. The presence and degree of contamination would greatly depend on the types of goods stored. For example, warehouses that stored general household goods (e.g. furniture and toys) are unlikely to cause contamination to the underlying soil and groundwater. A site re-appraisal within these sites are therefore required at the later stage of the development to (i) assess the nature of these warehouses and site conditions, (ii) confirm the necessity for site investigation works and, if required, (iii) formulate the sampling and testing strategies.

Site Background	
Company Name	Unknown
Site ID	C85
Suspected Current Land Use / Activities	Vacant
Approximate Area (m ²)	6,000
Locations	Southeast of San Wai Treatment Works

Desktop Review	
Review of Outline Zoning Plan	GB
Principal Rock Types / Characters on the Geological Survey Map	Qpa
Historical Land Use (Review of Historical Aerial Photos)	<ul style="list-style-type: none"> • 1978: A portion of a pond is observed. • 1985: No significant change in land use is observed in comparison with the land use from 1978 aerial photo. • 1995: A pond was split into several small ponds. • 2010: Warehouse type structures and lorry parking areas are observed. • 2013: The site was vacant.
Reference of Historical Aerial Photos	Appendix A2 - Sheet 16 of 31
Lot No.	DD125 1457RP – 1460 OSL
Land Ownership Status	Private

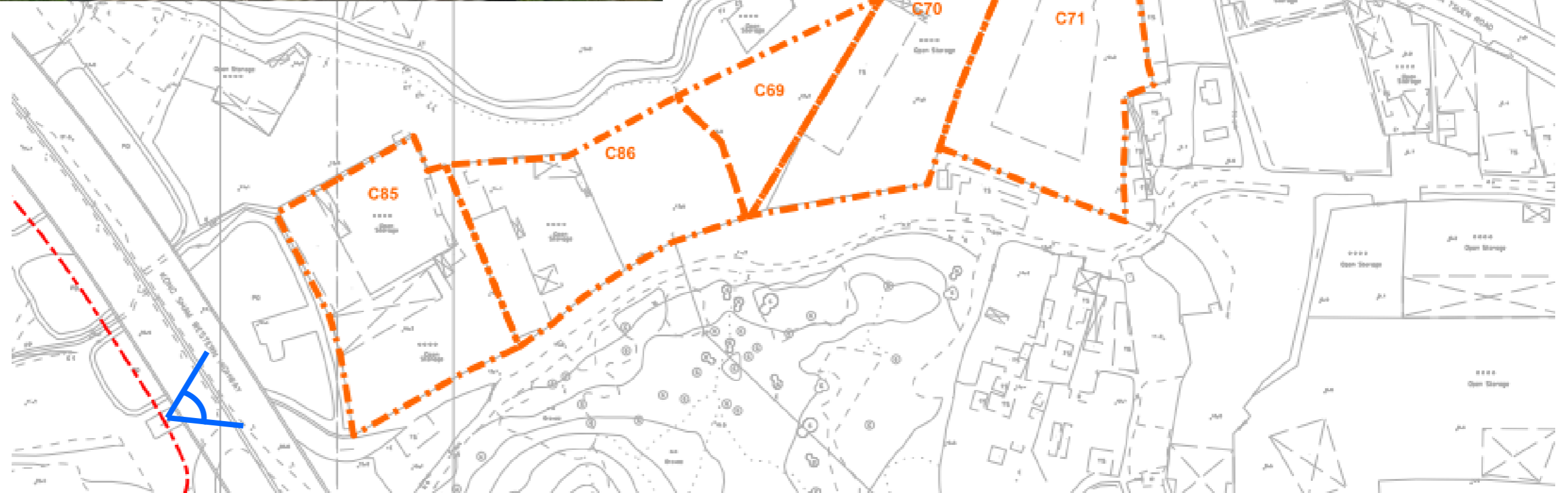
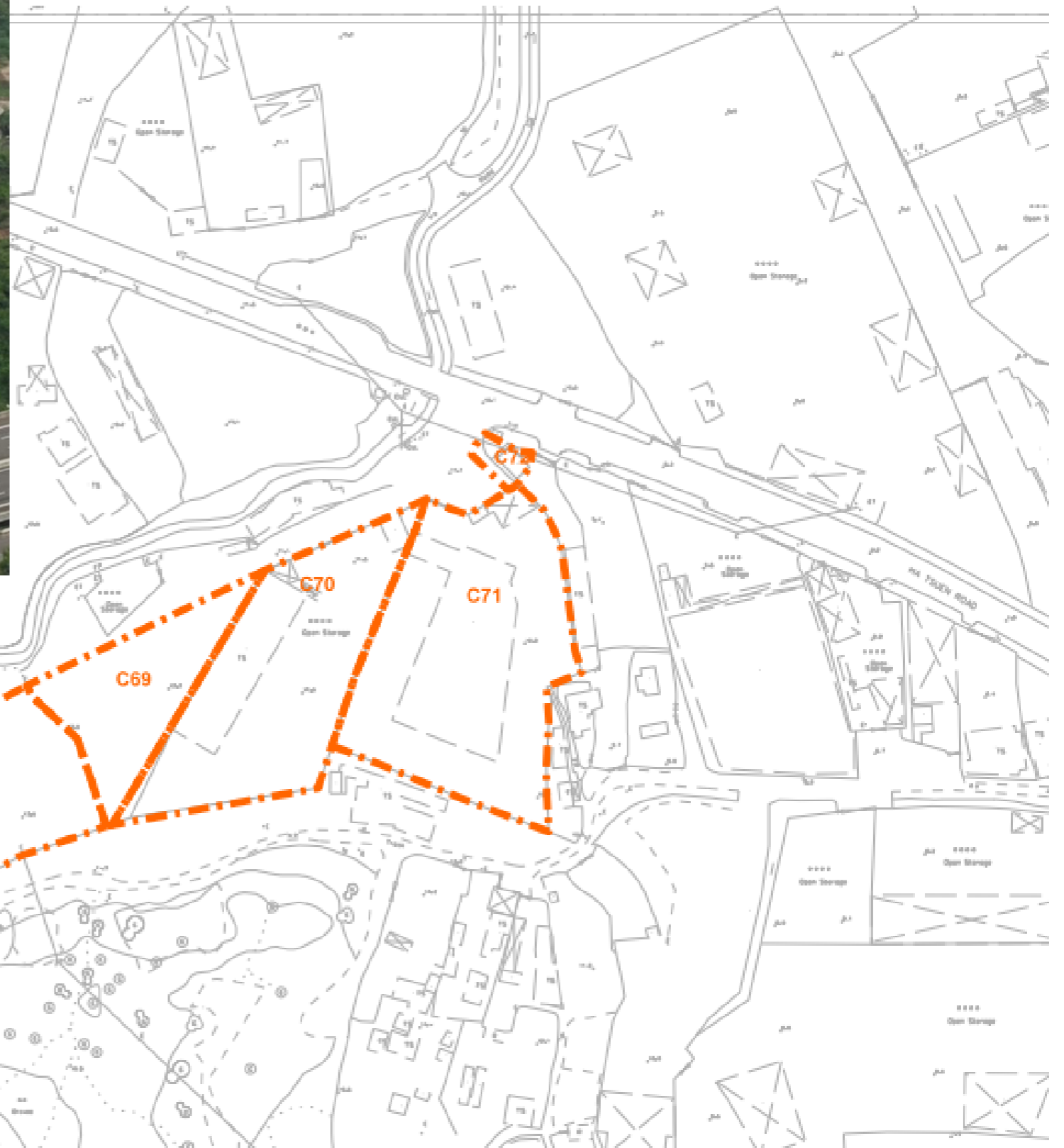
Site Reconnaissance Information and Recommendation	
Date of Survey	Dec-14
Conducted by	Eleanor Cunningham and Squall Lam
Site Observation	The site was vacant and concrete paved.
Potentially Contaminating Activities	<u>Current Activities and Information from FSD and EPD</u> No potentially contaminating activities were identified. Based on FSD/EPD information, there were no DGs / chemical wastes / incident / spillage records for the site.
	<u>Past Activities</u> Warehouse The possible contaminating activities may include loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.
References of Photographs of Site Reconnaissance	Appendix E3 - Sheet 18 of 36
Recommended No. of Boreholes*	21
Recommended Grid Size in Practice Guide (in meters)*	17
Key Chemicals of Concern	Metals (full list), PCRs, VOCs and SVOCs.
Necessity for Further Site Investigation	Yes
Future Land Use	Green Belt, Road, Sewage Treatment Works and Logistics Facility
RBRGs	Lower of Industrial or Public Park

Note: The recommended testing and sampling protocol (i.e. grid size, no. of boreholes and key COCs) is only tentative and is subject to be reviewed after the sites are resumed by the Project Proponent.

*Determination of the number of boreholes and grid size is based on EPD Practice Guide for Investigation and Remediation of Contaminated Land (PG) as summarized below:

Area of Site (m ²)	Grid Size	Min Number of Sampling Points
100	6	3
500	13	3
1,000	13	6
2,000	13	12
4,000	17	14
5,000	17	17
8,000	17	28
10,000	19	29
30,000	31	32
90,000	51	35

^TBC: To be confirmed. The current land uses are warehouse with no other historical potentially contaminated land uses identified. The presence and degree of contamination would greatly depend on the types of goods stored. For example, warehouses that stored general household goods (e.g. furniture and toys) are unlikely to cause contamination to the underlying soil and groundwater. A site re-appraisal within these sites are therefore required at the later stage of the development to (i) assess the nature of these warehouses and site conditions, (ii) confirm the necessity for site investigation works and, if required, (iii) formulate the sampling and testing strategies.



AGREEMENT NO. CE 2/2011 (CE)
 HUNG SHUI KIU NEW DEVELOPMENT AREA
 PLANNING AND ENGINEERING STUDY –
 INVESTIGATION

Location of Surveyed Site
 (C69, C70, C71, C72, C85,
 C86)

SCALE	N.T.S.	DATE	March 2016
CHECK	PDA	DRAWN	VARIOUS
JOB NO.	60222570	APPENDIX E3 (Sheet 18 of 36)	Rev A



**AGREEMENT NO. CE 2/2011 (CE)
HUNG SHUI KIU NEW DEVELOPMENT AREA
PLANNING AND ENGINEERING STUDY –
INVESTIGATION**

**Location of Surveyed Site
(C80a, C80b, C81, C82,
C83, C84)**

SCALE	N.T.S.	DATE	March 2016
CHECK	PDA	DRAWN	VARIOUS
JOB NO.	60222570	APPENDIX E3 (Sheet 20 of 36)	Rev A

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Appendix C

Photographic Records of Site Walkover

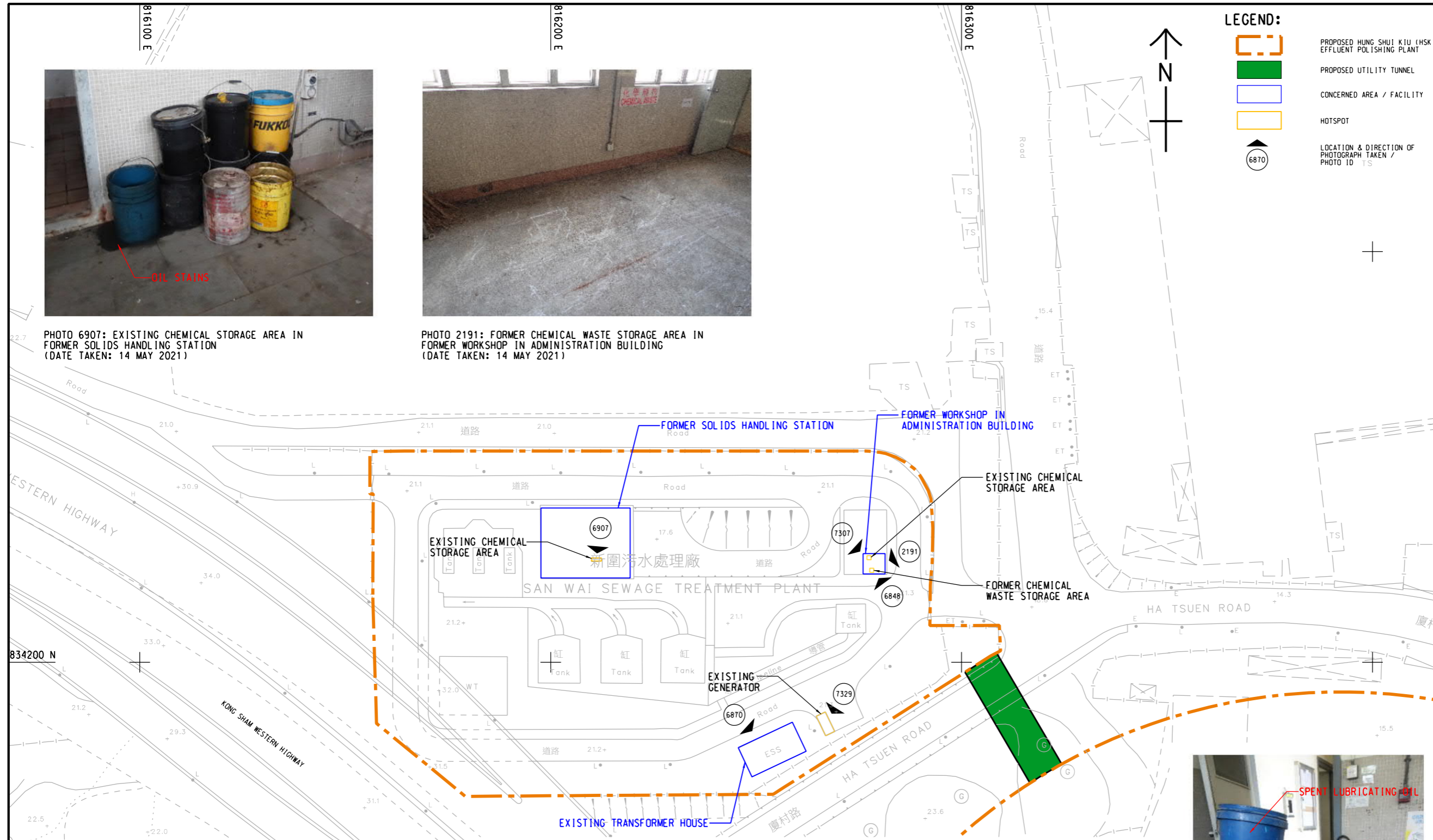
[Blank]



PHOTO 6907: EXISTING CHEMICAL STORAGE AREA IN FORMER SOLIDS HANDLING STATION (DATE TAKEN: 14 MAY 2021)



PHOTO 2191: FORMER CHEMICAL WASTE STORAGE AREA IN FORMER WORKSHOP IN ADMINISTRATION BUILDING (DATE TAKEN: 14 MAY 2021)



LEGEND:

- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- PROPOSED UTILITY TUNNEL
- CONCERNED AREA / FACILITY
- HOTSPOT
- LOCATION & DIRECTION OF PHOTOGRAPH TAKEN / PHOTO ID TS

AECOM

PROJECT

HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

CLIENT

渠務署
 Drainage Services Department

CONSULTANT

AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.

STATUS

SCALE **DIMENSION UNIT**

A1 1: 500 METRES

KEY PLAN



PHOTO 6870: EXISTING TRANSFORMER HOUSE (INACCESSIBLE) (DATE TAKEN: 14 MAY 2021)



PHOTO 7329: EXISTING BACKUP GENERATOR (DATE TAKEN: 14 MAY 2021)



PHOTO 7307: FORMER WORKSHOP IN ADMINISTRATION BUILDING (DATE TAKEN: 14 MAY 2021)



PHOTO 6848: EXISTING CHEMICAL STORAGE AREA IN FORMER WORKSHOP IN ADMINISTRATION BUILDING (DATE TAKEN: 14 MAY 2021)

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PROJECT NO. **CONTRACT NO.**

60631936 CE 6/2019 (DS)

SHEET TITLE

PHOTOGRAPHIC RECORDS OF SITE WALKOVER (SAN WAI PRELIMINARY TREATMENT WORKS)

SHEET 1 OF 2

SHEET NUMBER

60631936/EIA/HSKEPP/PR1

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:
2021/11/19
E:\PROJECTS\60631936\Drawing\REPORT\EIA\HSKEPP\777.dgn
Photo by: tao.chen



PHOTO 7364: STORAGE OF CONSTRUCTION MATERIALS AND ACCESS ROAD (DATE TAKEN: 14 MAY 2021)



PHOTO 7352: DISUSED FINE SCREEN CHAMBER (DATE TAKEN: 14 MAY 2021)



PHOTO 7345: FORMER SOLIDS HANDLING STATION (DATE TAKEN: 14 MAY 2021)



PHOTO 2242: BLEACH STORAGE AREA IN FORMER SOLIDS HANDLING STATION (DATE TAKEN: 14 MAY 2021)



PHOTO 6870: DISUSED DETRITOR (DATE TAKEN: 14 MAY 2021)



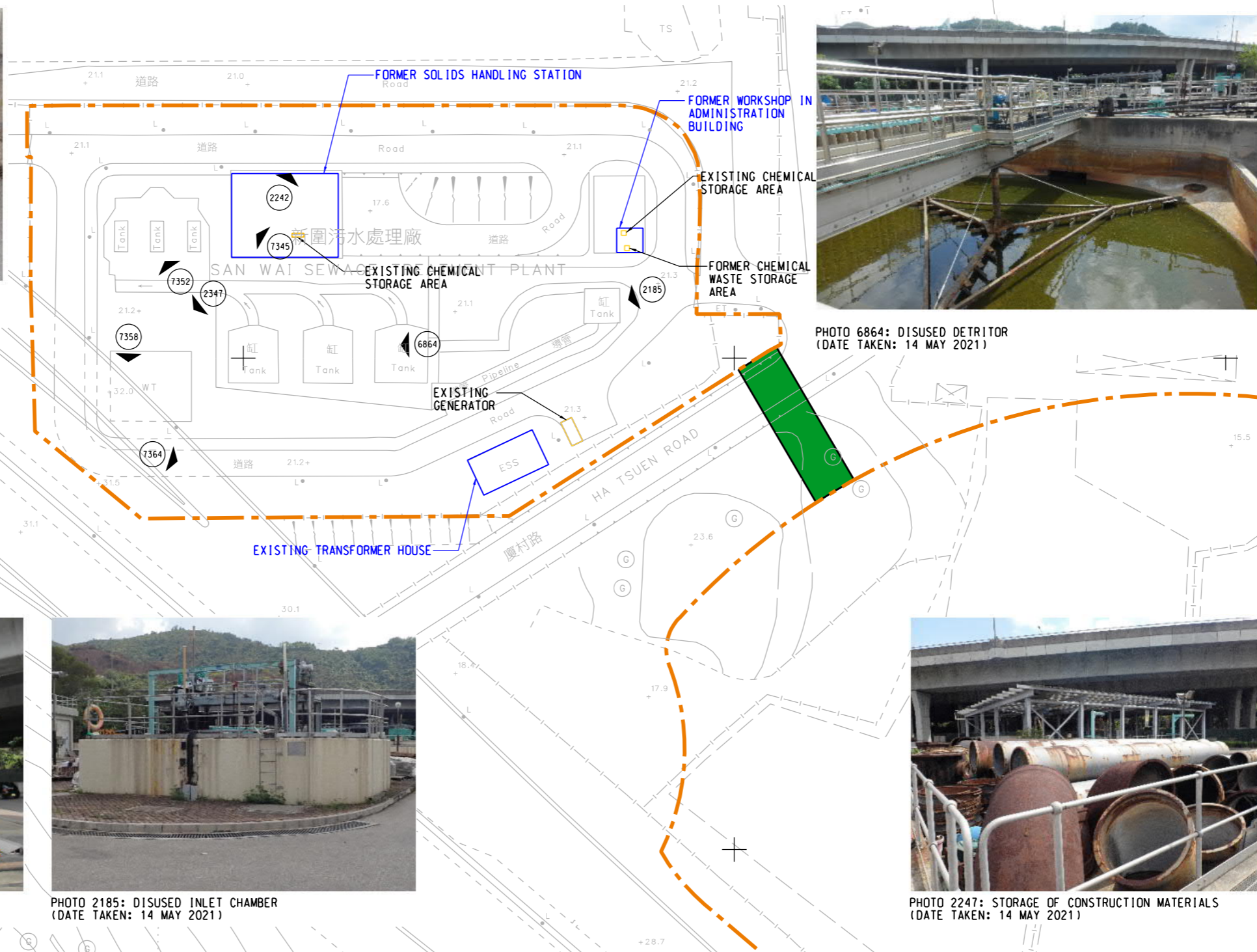
PHOTO 7358: DISUSED WATER STORAGE TANK (DATE TAKEN: 14 MAY 2021)



PHOTO 2185: DISUSED INLET CHAMBER (DATE TAKEN: 14 MAY 2021)



PHOTO 2247: STORAGE OF CONSTRUCTION MATERIALS (DATE TAKEN: 14 MAY 2021)



LEGEND:

- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- PROPOSED UTILITY TUNNEL
- CONCERNED AREA / FACILITY
- HOTSPOT
- LOCATION & DIRECTION OF PHOTOGRAPH TAKEN / PHOTO ID TS



PROJECT
HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

CLIENT
渠務署
Drainage Services Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION			
NO.	DATE	DESCRIPTION	CHK.

STATUS

SCALE
A1 1: 500

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60631936

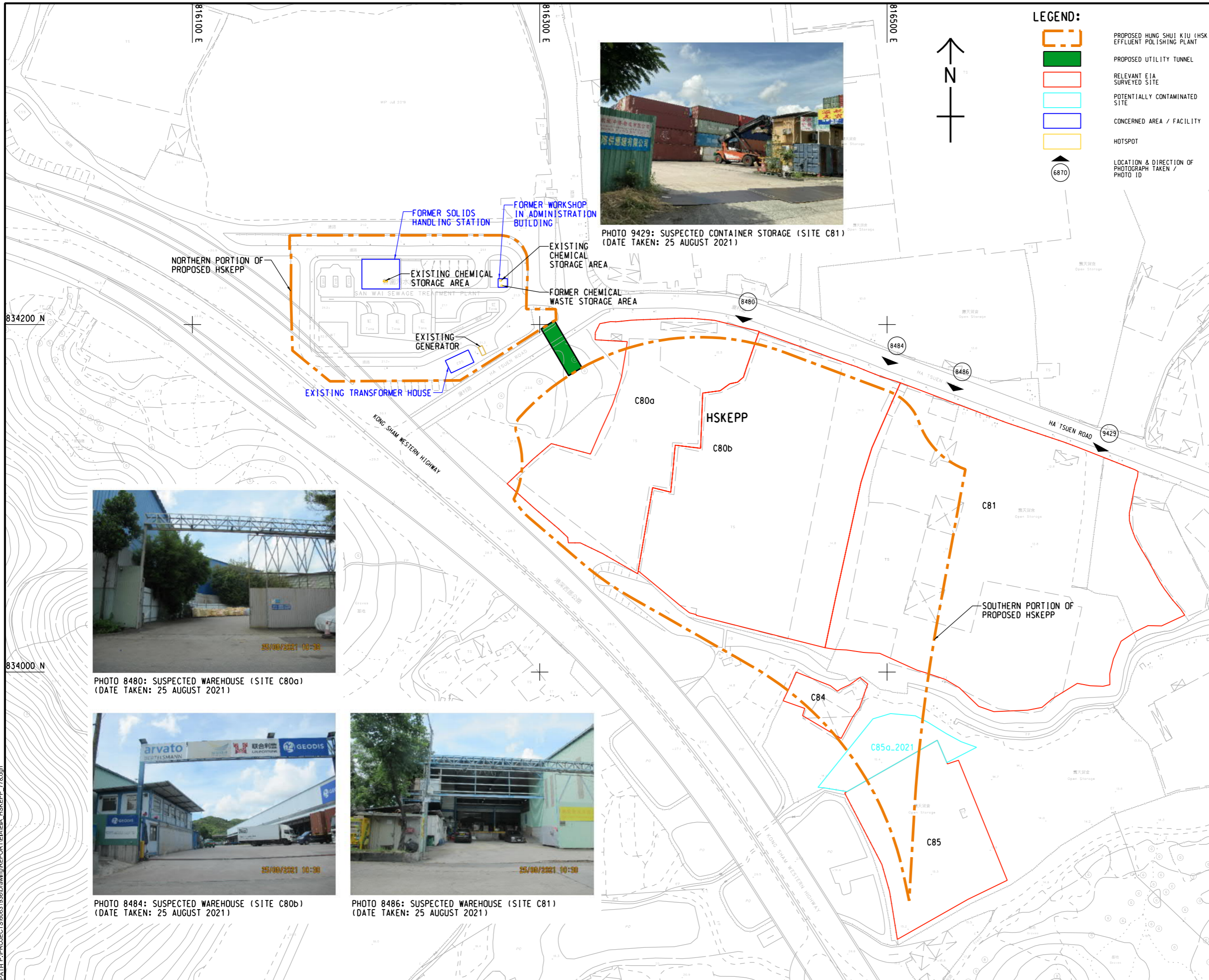
CONTRACT NO.
CE 6/2019 (DS)

SHEET TITLE
PHOTOGRAPHIC RECORDS OF SITE WALKOVER (SAN WAI PRELIMINARY TREATMENT WORKS)

SHEET NUMBER
60631936/EIA/HSKEPP/PR2

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 Checked:
 Designer:
 Project Management Initials:



PROJECT
 項目
HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

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

IR	DATE	DESCRIPTION	CHK.

STATUS
 狀況

SCALE
 比例
 A1 1: 1000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60631936

CONTRACT NO.
 合約編號
 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 PHOTOGRAPHIC RECORDS OF SITE WALKOVER

SHEET NUMBER
 圖紙編號
 60631936/EIA/HSKEPP/PR3

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



PHOTO 7574: SUSPECTED WAREHOUSE (SITE C84)
(DATE TAKEN: 25 AUGUST 2021)

PHOTO 9384: SUSPECTED WAREHOUSE (SITE C84)
(DATE TAKEN: 25 AUGUST 2021)



PHOTO 7486: SUSPECTED WAREHOUSE (SITE C85) & SUSPECTED OPEN AREA STORAGE (SITE C85a_2021)
(DATE TAKEN: 25 AUGUST 2021)



PHOTO 9391: SUSPECTED OPEN AREA STORAGE (SITE C85a_2021)
(DATE TAKEN: 25 AUGUST 2021)



PHOTO 8496: SUSPECTED WAREHOUSE (SITE C85)
(DATE TAKEN: 25 AUGUST 2021)

LEGEND:

- PROPOSED UTILITY TUNNEL
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- RELEVANT EIA SURVEYED SITE
- POTENTIALLY CONTAMINATED SITE
- CONCERNED AREA / FACILITY
- HOTSPOT
- LOCATION & DIRECTION OF PHOTOGRAPH TAKEN / PHOTO ID

AECOM

PROJECT

HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

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
A1 1: 1000

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60631936

CONTRACT NO.
CE 6/2019 (DS)

SHEET TITLE
PHOTOGRAPHIC RECORDS OF SITE WALKOVER

SHEET NUMBER
60631936/EIA/HSKEPP/PR4

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Appendix D
Site Walkover Checklists

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Annex C1

Site Walkover Checklist

DATE OF INSPECTION 14 May 2021

GENERAL SITE DETAILS

SITE OWNER/CLIENT Drainage Services Department

PROPERTY ADDRESS San Wai Preliminary Treatment Works,
Ha Tsuen Road, New Territories (Lot No. GYA-YL 214)

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Ms. Chloe Ng, Mr. Robert Yuen, Mr. Kin Au

POSITION Project / Graduate Environmental Consultant, AECOM

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Mr Au

POSITION Electrical Inspector, Drainage Services Department

TELEPHONE 2486 6421

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: 3

Part-time: N/A

Temporary/Seasonal: N/A

Maximum no. of people on site at any time: 3

Typical hours of operation: 24 hours

Number of shifts: 3 (8 am – 4 pm)

Days per week: 7

Weeks per year: 52

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: approx. 1.1 hectares

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

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

Drainage Services Department (Previous owner)

Is a site plan available? If yes, please attach. Yes/~~No~~ Refer to Figure 3.1 of CAP

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

If yes, identify those parties: _____

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

North: Works site of Phase 1 Upgrading of Sai Wai Sewage Treatment Works

South: Ha Tsuen Road, Kong Sham Western Highway

East: Ha Tsuen Road

West: Kong Sham Western 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.).

Generally flat terrain.

State the size and location of the nearest residential communities.

Tseung Kong Wai (area of about 2 ha, approx. 650m northeast of the site).

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

A "Conservation Area" is located to the west, south-west of the Project site, covering

123.22 ha of natural terrain of Yuen Tau Shan.

Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes
1. What are the main activities/operations at the above address?	--	Preliminary sewage treatment (decommissioned); Currently as construction materials storage.
2. How long have you been occupying the site?	N/A	18 years since 1993, with operation ceased in March 2021.
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?	N/A	
5. What were the main activities/operations during their occupancy?	N/A	Vacant land
6. Have there been any major changes in operations carried out at the site in the last 10 years?	Yes	Operation ceased in March 2021.
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	Sodium hypochlorite solution (bleach) was used for preliminary sewage treatment. Lubricating oils were used for equipment maintenance. Diesel was used as fuel for a backup generator.
• Where do you store these chemicals?	N/A	Bleach was stored in the former solids handling station; Lubricating oils were stored in the former workshop; Diesel was stored in the fuel tank of the generator.
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)?	N/A	Bleach and lubricant oils were received by trucks. Bleach and lubricating oils were stored in drums; Diesel was received by diesel oil tank truck and directly filled into the fuel tank of the generator.
16. Do you have any underground storage tanks? (If yes, please provide details.)	Yes	
• How many underground storage tanks do you have on site?	N/A	2
• What are the tanks constructed of?	N/A	Concrete
• What are the contents of these tanks?	N/A	Clean water and recycled water
• Are the pipelines above or below ground?	N/A	Above
• If the pipelines are below ground, has any leak and integrity testing been performed?	N/A	
• Have there been any spills associated with these tanks?	No	
17. Are there any disused underground storage tanks?	Yes	The water tanks have been disused since March 2021.
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	Yes	Checked daily by site staff.
19. How are the wastes disposed of?	N/A	Screened materials were disposed to landfill. Chemical wastes (spent lubricating oils) were stored in the former chemical waste storage area in the workshop and transported off-site regularly by licensed collectors.
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?	N/A	
• What were the substances spilled?	N/A	
• What was the quantity of material spilled?	N/A	
• Did you notify the relevant departments of the spill?	N/A	
• What were the actions taken to clean up the spill?	N/A	
• What were the areas affected?	N/A	
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.)?	N/A	The disused underground water tanks are currently remained on site and will be removed.
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	Bleach was observed on wooden pallets on tiled floor in the former solids handling station. The chemical storage area in the solids handling station was observed on tiled floor; The chemical and chemical waste storage areas inside the former workshop were concrete paved; The generator was observed on concrete paved ground.
2. What are the conditions of the bund walls and floors?	N/A	Tiled floor / wooden pallets / concrete paved floor and concrete paved ground were 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 lubricating oils.
5. Is there a storage site for the wastes?	Yes	Spent lubricating oils were stored in the former chemical waste storage area in the workshop.
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.)	Yes	Lubricating oil stains were observed on the tiled floor of the chemical storage area in the former solids handling station.
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	A transformer in the transformer house.
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?	Yes	Fuel (diesel) and lubricating oils were used on site.

Annex C1

Site Walkover Checklist

DATE OF INSPECTION 25 August 2021

GENERAL SITE DETAILS

SITE OWNER/CLIENT Drainage Services Department

PROPERTY ADDRESS Proposed Hung Shui Kiu Effluent Polishing Plant,
Ha Tsuen Road, Yuen Long (Except San Wai Preliminary Treatment Works)

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Ms. Chloe Ng, Mr. Robert Yuen, Mr. Kin Au

POSITION Project / Assistant / Graduate Environmental Consultant, AECOM

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Not available

POSITION --

TELEPHONE --

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: N/A

Part-time: N/A

Temporary/Seasonal: N/A

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

Annex C1

Site Walkover Checklist

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

Generally flat terrain.

State the size and location of the nearest residential communities.

Tseung Kong Wai (area of about 2 ha, approx. 500m northeast of the site).

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

A "Conservation Area" is located to the west, south-west of the Project site, covering

123.22 ha of natural terrain of Yuen Tau Shan.

Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes*
1. What are the main activities/operations at the above address?	--	Suspected various industrial land uses (warehouses, container storage and open area storage)
2. How long have you been occupying the site?	N/A	
3. Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	N/A	
4. Prior to your occupancy, who occupied the site?	N/A	
5. What were the main activities/operations during their occupancy?	N/A	
6. Have there been any major changes in operations carried out at the site in the last 10 years?	N/A	
7. Have any polluting activities been carried out in the vicinity of the site in the past?	N/A	
8. To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	N/A	
9. Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	N/A	
10. Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	N/A	
11. Are any chemicals used in your daily operations? (If yes, please provide details.)	N/A	
• Where do you store these chemicals?	N/A	
12. Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	N/A	
13. Has the facility produced a separate hazardous substance inventory?	N/A	
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.)	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: approx. 4.1 hectares

What area of the site is covered by buildings (%): approx. 60 %

Please list all current and previous owners/occupiers if possible. Government land and
mainly unknown private owners or occupiers.

Is a site plan available? If yes, please attach. Yes/~~No~~ Refer to Figure 2.1 of CAP

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

If yes, identify those parties: N/A

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

North: Ha Tsuen Road

South: Kong Sham Western Highway

East: Various industrial land uses

West: San Wai Preliminary Treatment Works

Annex C1

Site Walkover Checklist

Observations

	Yes/No	Notes*
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	N/A	No chemical storage areas observed.
2. What are the conditions of the bund walls and floors?	N/A	
3. Are any surface water drains located near to drum storage and unloading areas?	N/A	
4. Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	N/A	
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?	N/A	No chemicals observed.

* All sites were inaccessible at the time of site walkover, only peripheral observation were made.

	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)?	N/A	
16. Do you have any underground storage tanks? (If yes, please provide details.)	N/A	
• How many underground storage tanks do you have on site?	N/A	
• What are the tanks constructed of?	N/A	
• What are the contents of these tanks?	N/A	
• Are the pipelines above or below ground?	N/A	
• If the pipelines are below ground, has any leak and integrity testing been performed?	N/A	
• Have there been any spills associated with these tanks?	N/A	
17. Are there any disused underground storage tanks?	N/A	
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	N/A	
19. How are the wastes disposed of?	N/A	
20. Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	N/A	
21. Have any spills occurred on site? (If yes, please provide details.)	N/A	
• When did the spill occur?	N/A	
• What were the substances spilled?	N/A	
• What was the quantity of material spilled?	N/A	
• Did you notify the relevant departments of the spill?	N/A	
• What were the actions taken to clean up the spill?	N/A	
• What were the areas affected?	N/A	
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.)	N/A	
23. Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	N/A	
24. Are there any known contaminations on site? (If yes, please provide details.)	N/A	
25. Has the site ever been remediated? (If yes, please provide details.)	N/A	

* No interview was able to be conducted. Notes shown are based on observation from site walkover.

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Appendix E

Responses from Government Departments on Relevant Information

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Our Ref.: EPCY:WLKL:WKCW:qc:60631936/2020007477W

27 August 2020

27 AUG 2020
- AXED

By Fax (2685 1133) & Post

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

Dear Sir/Madam,

Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant – Investigation

Request for Information of Chemical Waste Producer and Chemical Spillage Accident

AECOM Asia Co. Ltd. has been commissioned by Drainage Services Department as the Consultant to undertake land contamination assessment for the captioned project. The Concerned Areas are indicated in the figures enclosed.

As part of the land contamination assessment and following *the Practice Guide for Investigation and Remediation of Contaminated Land* issued by EPD, we have to collect historical information regarding the past and present activities of the Concerned Areas. In order to facilitate our assessment, we would like to request for the following information regarding the captioned Concerned Areas:

1. Current and past (as 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 chemical waste); and
2. Reported accidents of spillage / leakage of chemicals within the Concerned Areas.

Please feel free to contact our Ms. Chloe Ng at 3922 9305 / Mr. Robert Yuen at 3922 9439 should you have any queries.

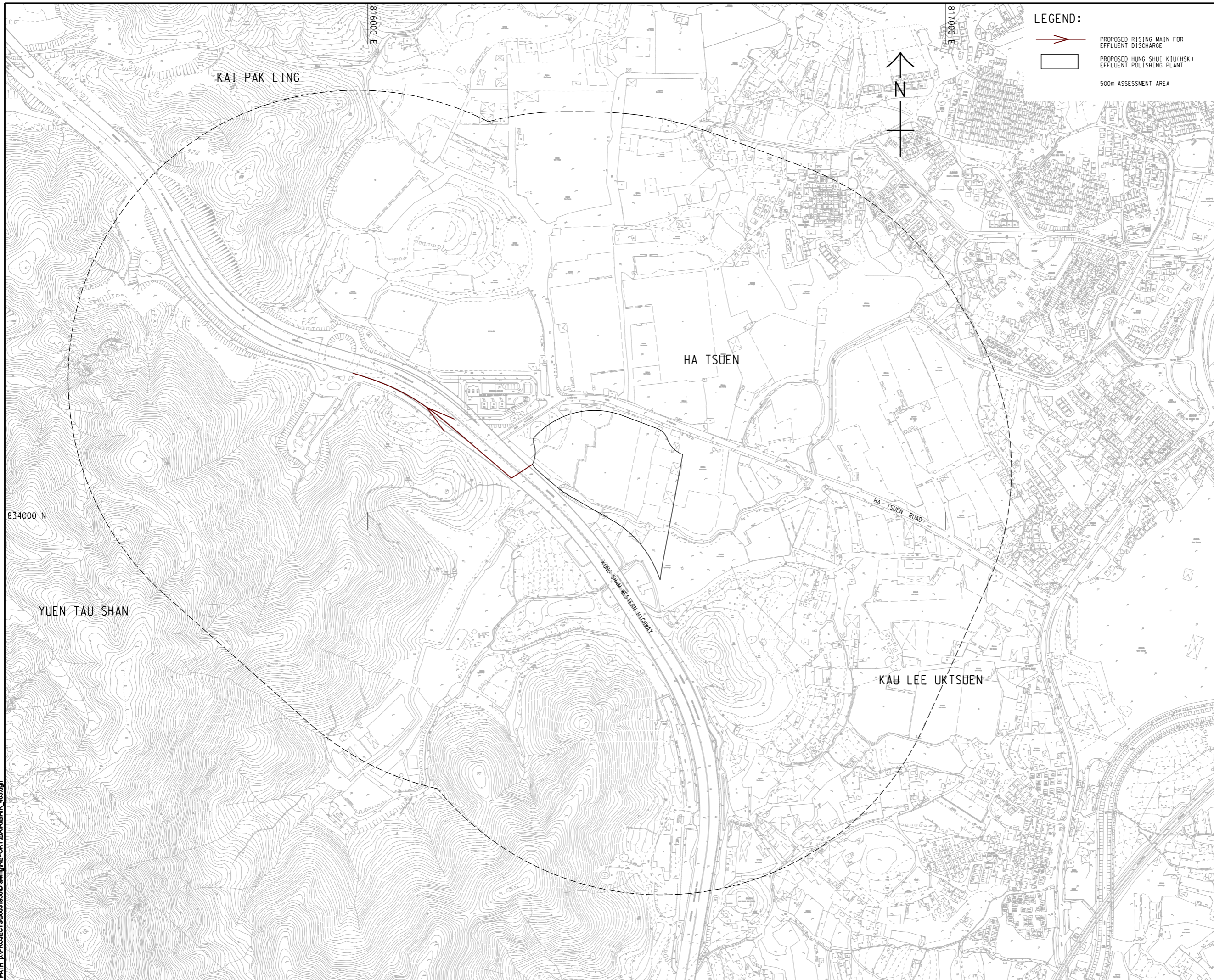
Thank you very much for your kind assistance.

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






Edward Poon
Executive Director
Water, Hong Kong

Encl. Site Location Plan Drawing No. 606031936/EIAIR005 & 006



LEGEND:

-  PROPOSED RISING MAIN FOR EFFLUENT DISCHARGE
-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  500m ASSESSMENT AREA

AECOM

PROJECT

**HUNG SHUI KIU
EFFLUENT POLISHING
PLANT AND
YUEN LONG SOUTH
EFFLUENT POLISHING
PLANT - INVESTIGATION**

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 : 3000

DIMENSION UNIT

米/公尺

KEY PLAN

PROJECT NO.

60631936

CONTRACT NO.

CE 6/2019 (DS)

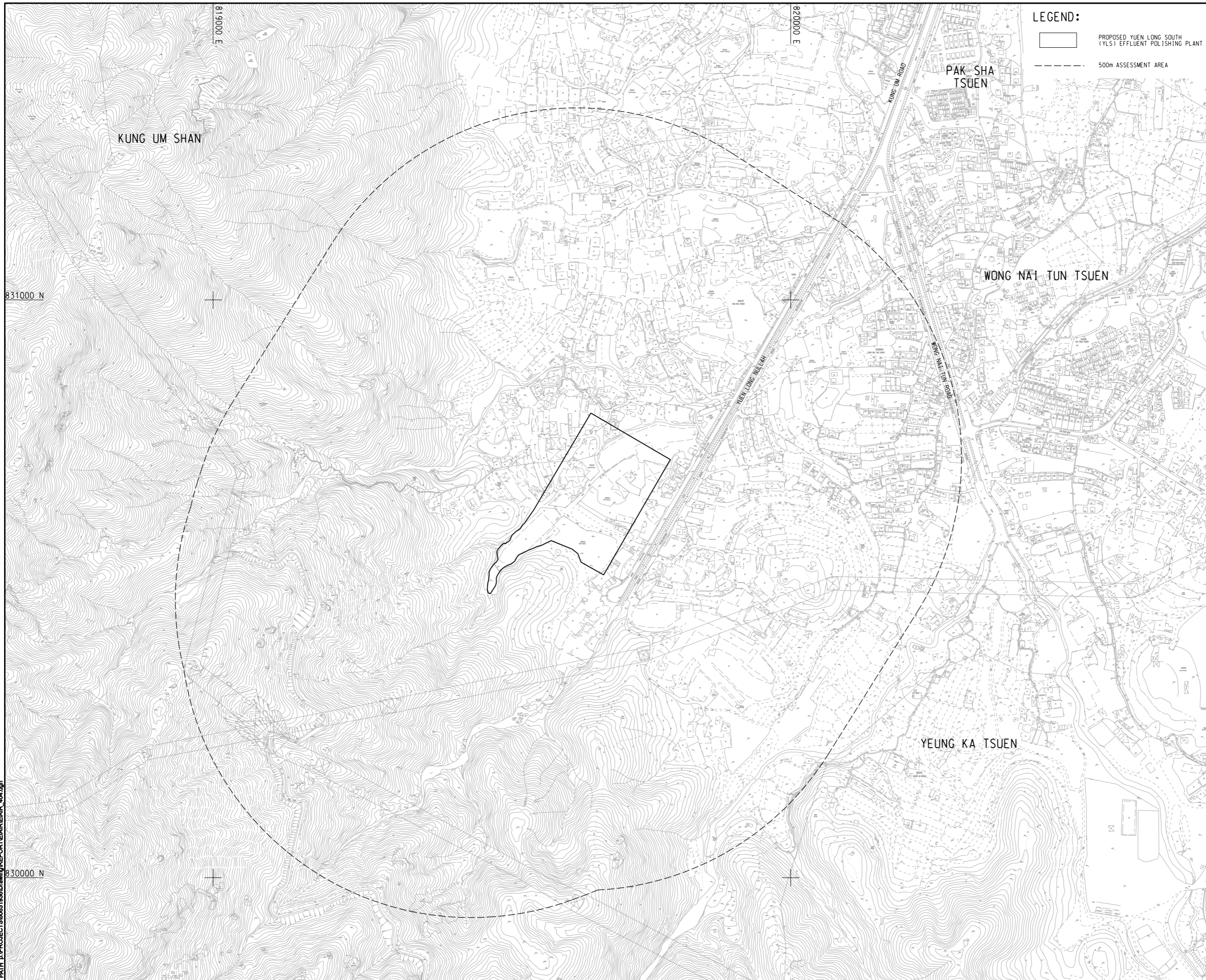
SHEET TITLE

**SITE LOCATION PLAN AND 500m
ASSESSMENT AREA
(HUNG SHUI KIU
EFFLUENT POLISHING PLANT)**

SHEET NUMBER

60631936/EAIR/003

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LEGEND:

- PROPOSED YUEN LONG SOUTH (YLS) EFFLUENT POLISHING PLANT
- 500m ASSESSMENT AREA

AECOM

PROJECT
項目

HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

CLIENT
業主

渠務署
Drainage Services Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
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SUB-CONSULTANTS
分判工程顧問公司

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修訂

NO.	DATE	DESCRIPTION	CHK.

STATUS
階段

NO.	DATE	DESCRIPTION	CHK.

SCALE
比例

A1 1 : 3000

KEY PLAN
索引圖

PROJECT NO.
項目編號

60631936

CONTRACT NO.
合約編號

CE 6/2019 (DS)

SHEET TITLE
圖紙名稱

SITE LOCATION PLAN AND 500m ASSESSMENT AREA (YUEN LONG SOUTH EFFLUENT POLISHING PLANT)

SHEET NUMBER
圖紙編號

60631936/EAIR/004

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本署檔案
OUR REF: EP910/G1/1/YLW
來函檔案
YOUR REF:
TEL NO: 2158 5825
圖文傳真
FAX NO: 2650 6033
網址
HOMEPAGE: <http://www.epd.gov.hk/>

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F, Sha Tin Government Offices,
No. 1 Sheung Wo Che Road,
Shatin, 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
上禾輦路一號
沙田政府合署十樓

23 October 2020

AECOM
8/F. Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, HK.
(Attn.: Edward Poon, Executive Director)

Dear Mr. POON,

Agreement No. CE 8/2019 (DS)

**Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant –
Investigation
Request for Information of Chemical Waste Producer and Chemical Spillage Accident**

I refer your letter received by this department on 3 September 2020 about the captioned. Our reply is as below:-

- (a) For the register of Chemical Waste Producers, a registry is available at our Territory Control Office at Wan Chai. Please contact our Mr. Dennis LEUNG, Senior Environmental Protection Inspector, at Tel : 2835 1027 for details;
- (b) For the records of reported accidents of spillage/leakage of chemicals at the areas specified in Site Location Plan of your letter, please be informed that there is no reported chemical spillage accidents in the past three years.

Please contact me should you have any questions.

Yours faithfully,

(William WONG)

for Director of Environmental Protection

Au, Kin

From: Au, Kin
Sent: Tuesday, August 31, 2021 4:28 PM
To: hllai@epd.gov.hk
Cc: dennisleung@epd.gov.hk; ericfung@epd.gov.hk; Ng, Lok Yi Chloe; Yuen, Robert; Tso, Shiu Heng Lawrence; Tam, Ching Yee Christine; Ng, Jenny; Man, Yu Kit Marty
Subject: CE 6/2019 (DS) - Request for Information of CWP and Chemical Spillage Accident Records (Updated Boundaries)
Attachments: Responses from Government Departments on Relevant Information_EPD.pdf; Layout Plan_Updated Boundaries.pdf
Follow Up Flag: Follow up
Flag Status: Flagged

Dear Mr. Lai,

I refer to our letter ref.: 60631936/2020007477W dated 27 August 2020 and your reply with ref.: EP910/G1/1/YLW dated 23 October 2020, regarding our captioned information request.

We would like to request for the following information regarding the updated project boundary of Proposed Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant as indicated in **Layout Plan_Updated Boundaries** attached:

1. Current and past (as early as the records are available) registered Chemical Waste Producer(s) within the updated project boundary (preferably with the registration date, status (active or inactive), nature and quantity of the chemical waste); and
2. Reported accidents of spillage / leakage of chemicals within the updated project boundary.

Attached the letter for your reference. Due to tight study programme, grateful if you could help to follow up and provide us the information by 15 September 2021.

Please feel free to contact our Ms. Chloe Ng at 3922 9305 or Mr. Kin Au at 3922 9507 should you have any queries.

Thank you very much for your kind assistance.

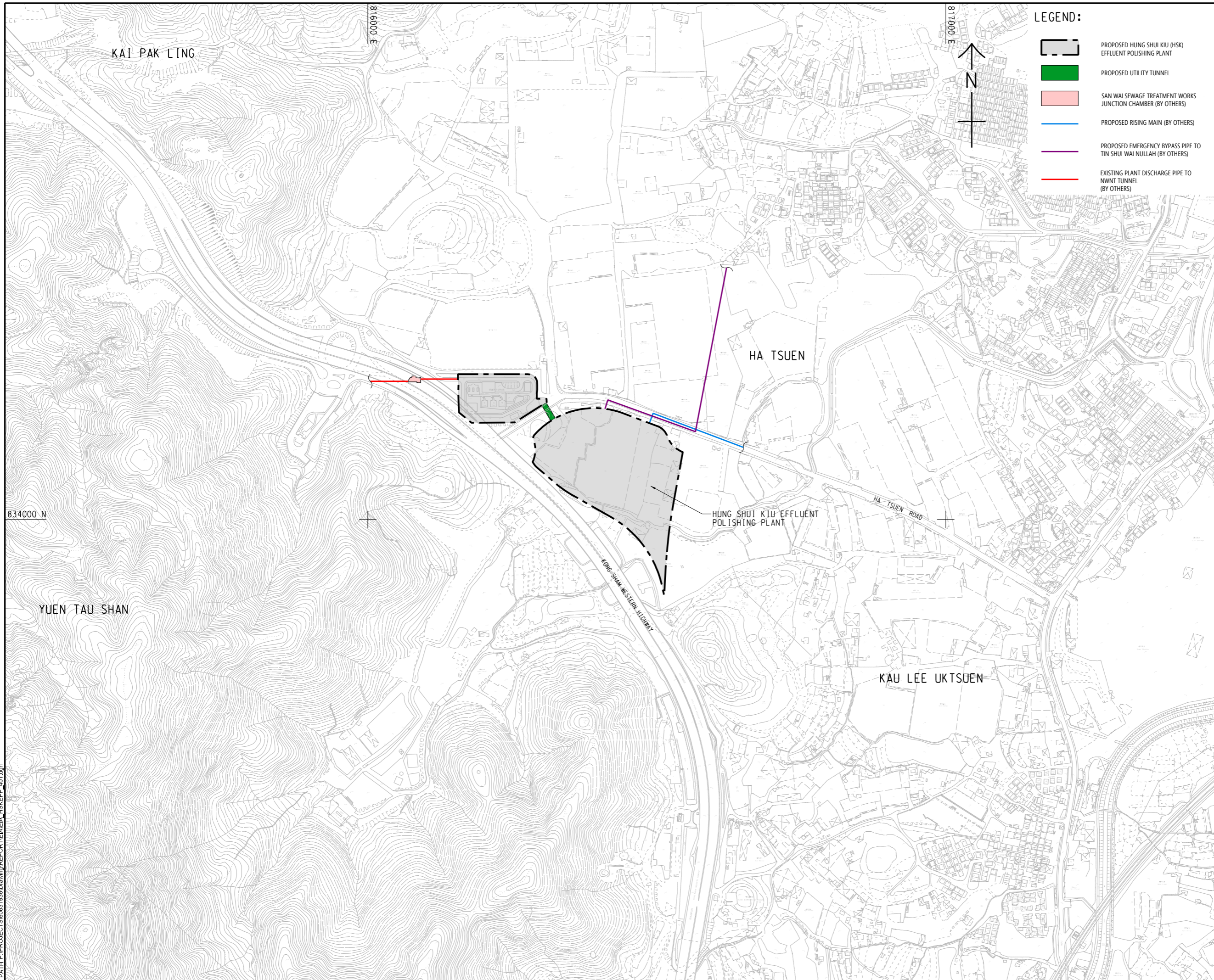
Regards,

Kin Au







Graduate Environmental Consultant, Environment, Hong Kong
D +852 3922 9507
kin.au@aecom.com

AECOM
aecom.com

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LEGEND:

-  PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
-  PROPOSED UTILITY TUNNEL
-  SAN WAI SEWAGE TREATMENT WORKS JUNCTION CHAMBER (BY OTHERS)
-  PROPOSED RISING MAIN (BY OTHERS)
-  PROPOSED EMERGENCY BYPASS PIPE TO TIN SHUI WAI NULLAH (BY OTHERS)
-  EXISTING PLANT DISCHARGE PIPE TO NWNT TUNNEL (BY OTHERS)



PROJECT
 HUNG SHUI KIU EFFLUENT POLISHING PLANT AND YUEN LONG SOUTH EFFLUENT POLISHING PLANT - INVESTIGATION

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 : 3000

DIMENSION UNIT
 METERS

KEY PLAN

PROJECT NO.
 60631936

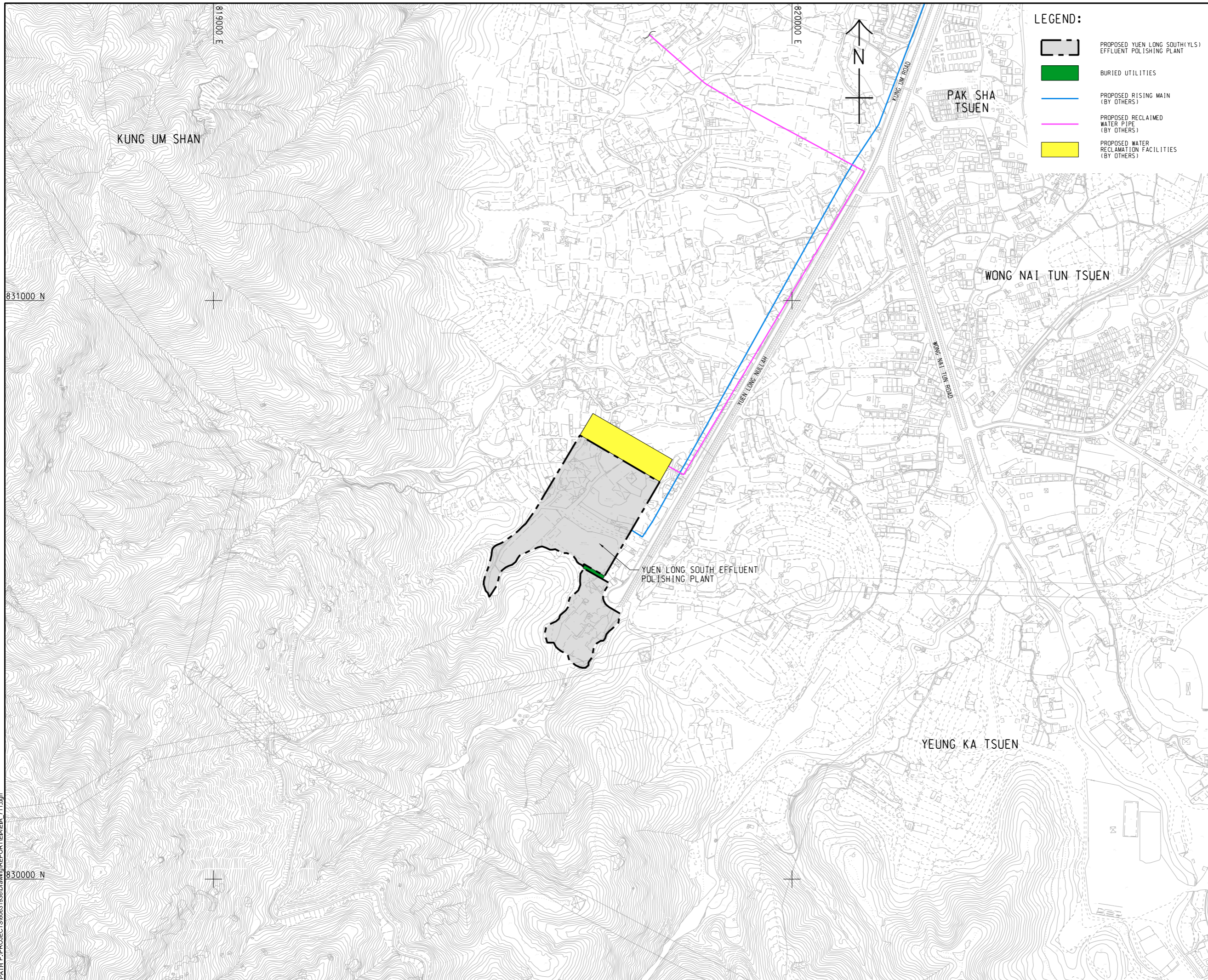
CONTRACT NO.
 CE 6/2019 (DS)

SHEET TITLE
 LOCATION OF HUNG SHUI KIU EFFLUENT POLISHING PLANT

SHEET NUMBER
 60631936/EIA/HSKEPP/FIGURE 1.1

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ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:
 2021/10/5
 PATH P:\PROJECTS\60631936\Drawing\REPORT\EA\EA_711.dgn



LEGEND:

- PROPOSED YUEN LONG SOUTH (YLS) EFFLUENT POLISHING PLANT
- BURIED UTILITIES
- PROPOSED RISING MAIN (BY OTHERS)
- PROPOSED RECLAIMED WATER PIPE (BY OTHERS)
- PROPOSED WATER RECLAMATION FACILITIES (BY OTHERS)



PROJECT
 HUNG SHUI KIU
 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
 EFFLUENT POLISHING
 PLANT - INVESTIGATION

CLIENT
 渠務署
 Drainage Services Department

CONSULTANT
 AECOM Asia Company Ltd.
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 分判工程師公司

ISSUE/REVISION

IR	DATE	DESCRIPTION	CHK.

STATUS

SCALE
 A1 1 : 3000

DIMENSION UNIT
 METRES

KEY PLAN

PROJECT NO.
 60631936

CONTRACT NO.
 CE 6/2019 (DS)

SHEET TITLE
 LOCATION OF YUEN LONG SOUTH
 EFFLUENT POLISHING PLANT

SHEET NUMBER
 60631936/EIA/FIGURE 1.1

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Au, Kin

From: hllai@epd.gov.hk
Sent: Tuesday, September 28, 2021 4:13 PM
To: Au, Kin
Subject: [EXTERNAL] Re: CE 6/2019 (DS) - Request for Information of CWP and Chemical Spillage Accident Records (Updated Boundaries)

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Mr. AU,

CE 6/2019 (DS) - Request for Information of CWP and Chemical Spillage Accident Records (Updated Boundaries)

I refer your email dated 31 August 2021 about the captioned. Our reply is as below:-

(a) This Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may also need to check with other parties / departments for such information as appropriate.

(b) For the register of Chemical Waste Producers, a registry is available at our Territory Control Office at Wan Chai. Please contact our Mr. Eric FUNG, Senior Environmental Protection Inspector, at Tel : 2835 1027 for details;

Yours faithfully,

Best Regards,
LAI Ho-leung, LEO
EPD, Tel :2158 5825

From: "Au, Kin" <kin.au@aecom.com>
To: "hllai@epd.gov.hk" <hllai@epd.gov.hk>
Cc: "dennisleung@epd.gov.hk" <dennisleung@epd.gov.hk>, "ericfung@epd.gov.hk" <ericfung@epd.gov.hk>, "Ng, Lok Yi Chloe" <Chloe.Ng@aecom.com>, "Yuen, Robert" <robert.yuen@aecom.com>, "Tso, Shiu Heng Lawrence" <lawrence.tso@aecom.com>, "Tam, Ching Yee Christine" <christine.tam@aecom.com>, "Ng, Jenny" <jenny.ng1@aecom.com>, "Man, Yu Kit Marty" <marty.man@aecom.com>
Date: 31/08/2021 16:30
Subject: CE 6/2019 (DS) - Request for Information of CWP and Chemical Spillage Accident Records (Updated Boundaries)

Dear Mr. Lai,

I refer to our letter ref.: 60631936/2020007477W dated 27 August 2020 and your reply with ref.: EP910/G1/1/YLW dated 23 October 2020, regarding our captioned information request.

We would like to request for the following information regarding the updated project boundary of Proposed Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant as indicated in **Layout Plan_Updated Boundaries** attached:

1. Current and past (as early as the records are available) registered Chemical Waste Producer(s) within the updated project boundary (preferably with the registration date, status (active or inactive), nature and quantity of the chemical waste); and
2. Reported accidents of spillage / leakage of chemicals within the updated project boundary.

Attached the letter for your reference. Due to tight study programme, grateful if you could help to follow up and provide us the information by 15 September 2021.

Please feel free to contact our Ms. Chloe Ng at 3922 9305 or Mr. Kin Au at 3922 9507 should you have any queries.

Thank you very much for your kind assistance.

Regards,

Kin Au

Graduate Environmental Consultant, Environment, Hong Kong
D +852 3922 9507
kin.au@aecom.com

AECOM
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Our Ref.: EPCY:WLKL:WKCW:qc:60631936/2020010625W

18 September 2020

By Fax (2739 5879) & Post

Fire Services Department
Fire Services Headquarters Command
Management Group (MG)
9/F, Fire Services HQ Building,
1 Hong Chong Road, Tsim Sha Tsui East,
Kowloon

Attn: Mr Kong, Wai Chung

Dear Sir,

**Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and Yuen Long South Effluent Polishing Plant –
Investigation**

Request for Information about Dangerous Goods Store and Incidents Records

I refer to your letter (ref: (136) in FSD GR 6-5/4 R Pt.28) dated 7 September 2020 regarding the captioned subject.

We have provided additional information on the drawings showing some of the street names, facilities names and building names within the study areas.

For your record, the appointment letter from our client, Drainage Services Department (DSD), was also enclosed.

Please feel free to contact our Ms. Chloe Ng at 3922 9305 / Mr. Robert Yuen at 3922 9439 should you have any queries.

Thank you very much for your kind assistance.

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


Edward Poon
Executive Director
Water, Hong Kong

Encl. Site Location Plan (Drawing No. 60639136/EIAIR005 and 006)
Appointment letter from DSD

cc CE/HATS, DSD -Attn: Mr. LEE C. C. Lawrence (w/o encl.)



**Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme Division
5/F, Western Magistracy,
2A Pok Fu Lam Road, Hong Kong**

**渠務署
污水處理服務科
淨化海港計劃部
香港德輔道西 2A 號
四區裁判法院 5 樓**

來函編號 Your Ref:

本署編號 Our Ref: (00QZTL) in DSD HATS 1/CE201906

電話 Tel: (852) 2594 7299

圖文傳真 Fax: (852) 3104 6426

By Fax and Post

6 April 2020

DISTRIBUTION

Dear Sirs,

**Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and
Yuen Long South Effluent Polishing Plant – Investigation**

Notification of Award of Consultancy


I am pleased to inform you that AECOM Asia Company Limited (AECOM) has been appointed by this Department to undertake the captioned consultancy Agreement which commenced on 27 March 2020 for completion in 2022.

2. The scope of the assignment comprises the following for Hung Shui Kiu Effluent Polishing Plant (HSKEPP) and Yuen Long South Effluent Polishing Plant (YLSEPP) and the overall layout plans of the project are enclosed for reference:-

- (a) investigation study and preliminary design of HSKEPP and YLSEPP;
- (b) impact assessments, public engagement and consultation;
- (c) site investigation, surveys and laboratory testing; and
- (d) any other works recommended from various technical studies and assessments in the contract.

3. During the period of the above Agreement, AECOM may approach your office to request for information in relation to the Agreement. I should be grateful if you would offer your kind assistance to them such that the Agreement could be carried out successfully. Should you have any enquiry, please feel free to contact the undersigned. Thank you for your kind assistance.

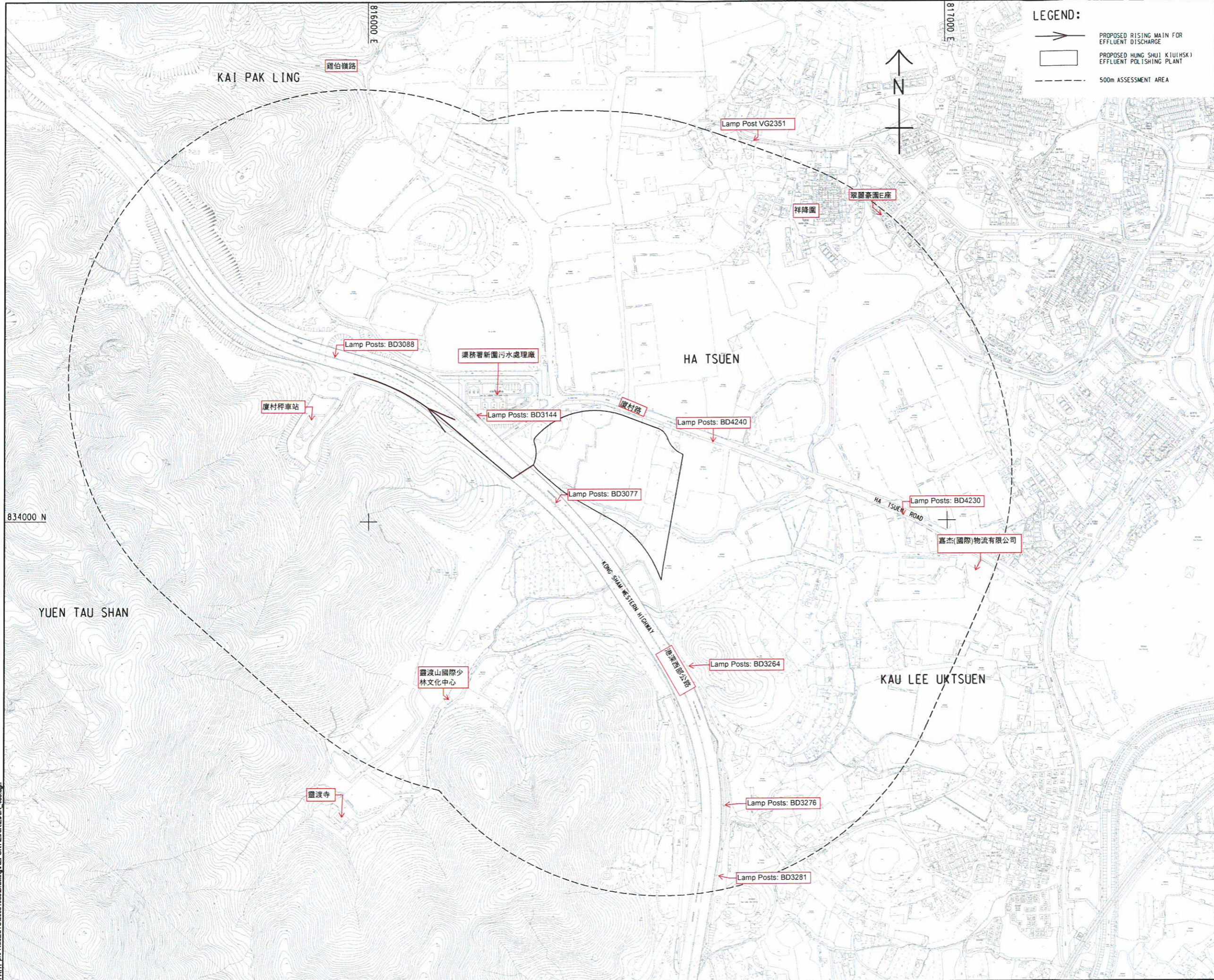
Yours faithfully,


(Oliver W K AU-YEUNG)

for Chief Engineer / Harbour Area Treatment Scheme
Drainage Services Department

Encl.

Plot File by: GaoYU 20200722
 PATH: p:\PROJECTS\60631936\Drawing\REPORT\EAIR\EAIR_403.dgn
 ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:



LEGEND:

- PROPOSED RISING MAIN FOR EFFLUENT DISCHARGE
- PROPOSED HUNG SHUI KIU (HSK) EFFLUENT POLISHING PLANT
- 500m ASSESSMENT AREA

AECOM

PROJECT
 HUNG SHUI KIU
 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
 EFFLUENT POLISHING
 PLANT - INVESTIGATION

CLIENT
 渠務署
 Drainage Services Department

CONSULTANT
 工程顧問公司
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ISSUE/REVISION

IR	DATE	DESCRIPTION	CHK
號	日期	內容摘要	號

STATUS

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A1 1 : 3000

KEY PLAN

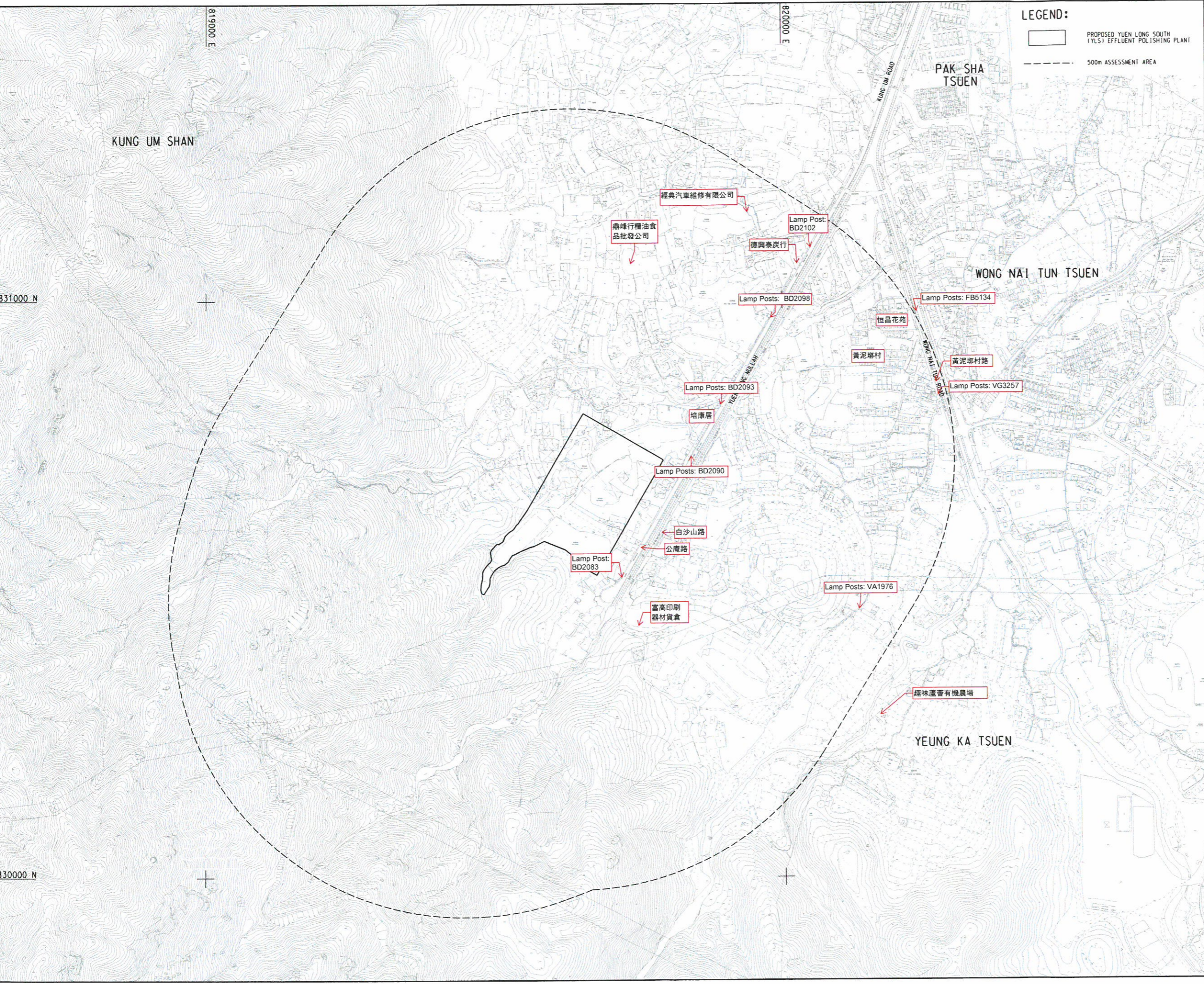
PROJECT NO. **CONTRACT NO.**
 項目編號 合約編號
 60631936 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 SITE LOCATION PLAN AND 500m
 ASSESSMENT AREA
 (HUNG SHUI KIU
 EFFLUENT POLISHING PLANT)

SHEET NUMBER
 圖紙編號
 60631936/EIAIR/003

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Plot File By: GaoYU 2020/07/22
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 Project Management Initials: Designer: Checked: Approved: ISO A1 894mm x 841mm



LEGEND:
 PROPOSED YUEN LONG SOUTH (YLS) EFFLUENT POLISHING PLANT
 500m ASSESSMENT AREA

AECOM
PROJECT
 HUNG SHUI KIU
 EFFLUENT POLISHING
 PLANT AND
 YUEN LONG SOUTH
 EFFLUENT POLISHING
 PLANT - INVESTIGATION

CLIENT
 渠務署
Drainage Services Department
CONSULTANT
 工程顧問公司
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ISSUE/REVISION
 修訂

NR	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	檢核

STATUS
 階段

SCALE **DIMENSION UNIT**
 比例 尺寸單位
 A1 1 : 3000

KEY PLAN
 索引圖

PROJECT NO. **CONTRACT NO.**
 項目編號 合約編號
 60631936 CE 6/2019 (DS)

SHEET TITLE
 圖紙名稱
 SITE LOCATION PLAN AND 500m
 ASSESSMENT AREA
 (YUEN LONG SOUTH
 EFFLUENT POLISHING PLANT)

SHEET NUMBER
 圖紙編號
 60631936/EIAIR/004

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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. : (157) in FSD GR 6-5/4 R Pt. 30
來函檔號 YOUR REF. : EPCY:WLKL:WKCW:qc:60631936/2020010625W
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電話 TEL NO. : 2733 7741

14 January 2021

AECOM Asia Co. Ltd
12/F, Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong.
(Attn: Mr. Edward POON, Executive Director)

Dear Mr. POON,

**Agreement No. CE 6/2019 (DS)
Hung Shui Kiu Effluent Polishing Plant and
Yuen Long South Effluent Polishing Plant Investigation
Request for Information of Dangerous Goods & Incident Records**

I refer to your letter of 18.9.2020 regarding the captioned request and reply below in response to your questions:-

Please be advised that neither records of dangerous goods license, fire incidents 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,

(NG Wing-chi)
for Director of Fire Services

[Blank]

Appendix F

Relevant RBRGs, Soil Saturation Limit and Solubility Limit

[Blank]

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.

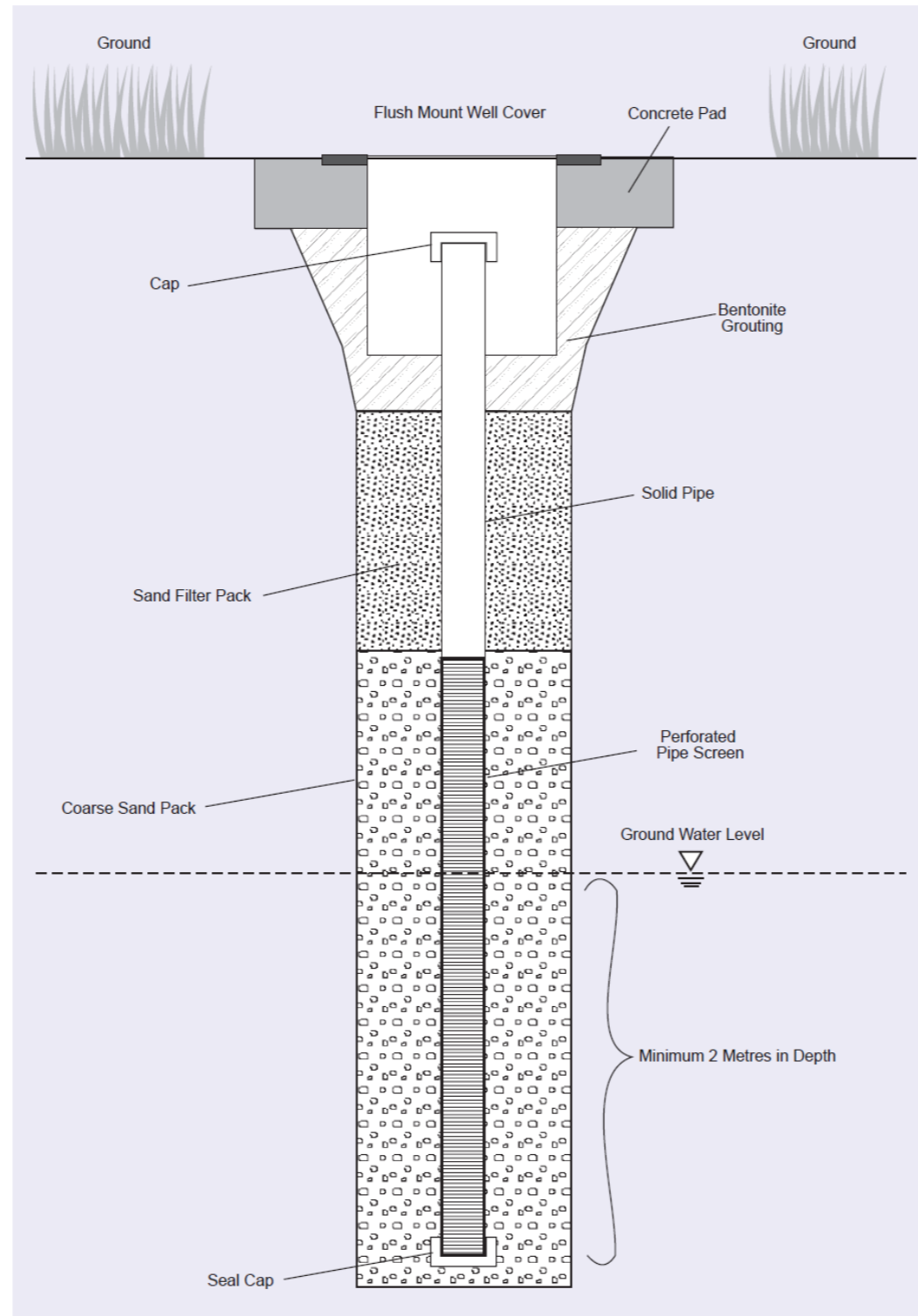
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Appendix G

Typical Design of Groundwater Monitoring Well

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Typical Design of a Groundwater Monitoring Well



Source: Practice Guide for Investigation and Remediation of Contaminated Land, EPD, Aug. 2011

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