



**CONTRACT NO. SPW 01/2021
ENVIRONMENTAL TEAM FOR
RELOCATION OF SHA TIN SEWAGE TREATMENT
WORKS TO CAVERNS – SITE PREPARATION
AND ACCESS TUNNEL CONSTRUCTION**

UNDER ENVIRONMENTAL PERMIT NO. EP-533/2017

**SUPPLEMENTARY CONTAMINATION ASSESSMENT PLAN
FOR SHA TIN SEWAGE TREATMENT WORKS
(FOR THE AREAS OF MECHANICAL WORKSHOP, CHEMICAL
WASTE AREA, SCRAP IRON STORAGE AREA AND CHEMICAL
WASTE COLLECTION TANK, DANGEROUS GOODS AND
CHEMICAL WASTE STORE, ENV-G04, ENV-G07, ENV-G14
AND ENV-G28)**

(REV. 4)

CLIENT:

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Date: 18 May 2022

Your ref:

Our ref: PL-202205032

AECOM Asia Limited
c/o Site Office
21 Hang Tai Road
Ma On Shan
New Territories

Attn: Mr. Simon Leung, CRE

Dear Mr. Leung,

Re: Contract No. DC/2018/05

**Relocation of Sha Tin Sewage Treatment Works to Cavern - Site Preparation and
Access Tunnel Construction
Supplementary Contamination Plan (Rev.4)**

Reference is made to the Supplementary Contamination Plan (Rev.4) provided by the Environmental Team on 17 May 2022.

Please be informed that we have no adverse comments on the captioned submission. We hereby verify the report in accordance with Condition 2.21 of Environmental Permit No. EP-533/2017.

Thank you for your attention.

Yours sincerely,
For and on behalf of
Acuity Sustainability Consulting Limited

Ir Y.H. LAW
Independent Environmental Checker

c.c. Drainage Services Department
Lam Environmental Services Limited

Attn.: Mr. Stanley Hung By e-mail
Attn.: Mr. Derek Lo By e-mail



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1. Introduction

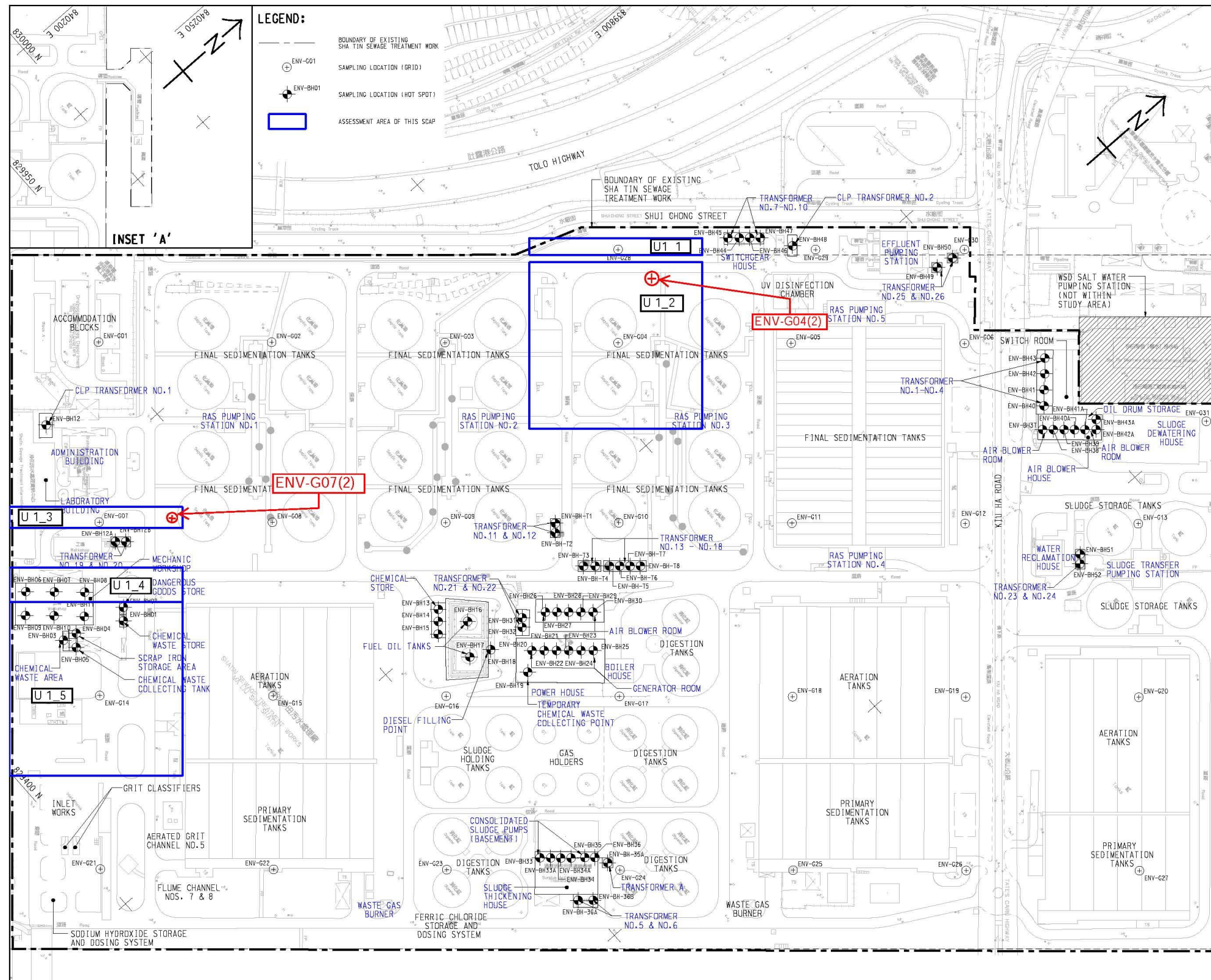
1.1 Background

- 1.1.1 To support social and economic development in Hong Kong, there is a pressing need to optimize the supply of land for various uses by sustainable and innovative approaches. One possible approach is rock cavern development. The Policy Agenda of the 2016 Policy Address has stated that works for the relocation of the Sha Tin Sewage Treatment Works (STSTW) is to commence as soon as possible to release the existing site, of a size about 28 hectares, for development purpose.
- 1.1.2 The Relocation of STSTW to Caverns (the Project) is implemented so as to release the existing site, of a size about 28 hectares, for other uses.
- 1.1.3 Lam Environmental Services Limited (LES) has been appointed by Drainage Services Department (DSD) to carry out the Supplementary Contamination Assessment Plan (SCAP) to identify the potential land contamination issues at the assessment area for partial fulfilment of Condition 2.21 of the EP.
- 1.1.4 DSD intends to redevelop part of the existing DSD STSTW Site (total 5 nos. marked with "U1_1, U1_2", U1_3, U1_4 and U1_5 in **Figure 1-1**, the Site) into workshops, new sewage treatment facilities and DG store. This SCAP only covers the assessment of those area and subsequent SCAP(s) for the existing STSTW will be submitted prior to demolition. Site location map is shown in **Figure 1-1**.

1.2 Environmental Legislation and Standards

- 1.2.1 The SCAP was prepared with reference to the following relevant legislations, documents and guidelines that are applicable to land contamination assessment and remediation in Hong Kong:
- Guidance Note for Contaminated Land Assessment and Remediation, issued on 15 August 2007 by the Environmental Protection Department (EPD) (the Guidance Note).
 - Guidance Manual for Use of Risk-Based Remediation Goals (RBRG) for Contaminated Land Management, published in December 2007 by EPD (the Guidance Manual).
 - Practice Guide for Investigation and Remediation of Contaminated Land, published in August 2011 by EPD (the Practice Guide).

Figure 1-1 Site Location Map



2. SITE APPRAISAL

2.1 Site Appraisal Approach

2.1.1 Site walkover was conducted on 3 June 2021 to identify the potential land contamination sources due to the present land-use activity at the Site that may lead to land contamination. Site appraisal also included review of previous contamination studies associated with the Site and historical information and site reconnaissance.

2.2 Review of Land Contamination Studies Associated With the Site

2.2.1 A Land Contamination Assessment was conducted for the EIA of Sha Tin Cavern Sewage Treatment Works (AEIAR-202/2016) to assess the potential land contamination concern at existing STSTW prior to July 2015 by reviewing previous land contamination assessment, site reconnaissance and acquisition of information from government department.

2.2.2 The Site falls within the assessment area of “Administration and Laboratory Buildings”, “Mechanic Workshop”, “Final Sediment Tank” and “Boundary of Existing STSTW” and the potential land contamination risk of Site were reviewed in the approved CAP. The previous site walkover conducted on 7 November 2014 and 28 December 2015 in the approved CAP concluded no land contamination was found within the ground floor of the “Administration and Laboratory Buildings” while a number of hotspots, including, for example, workshop, transformers, generators, diesel tanks and chemical / chemical waste storage area, were identified during the site walkover. The sampling point covered in the assessment area and there could be land contamination impacts if the underlying soil / groundwater were contaminated during the handling and storage of hazardous substances. SI works are recommended within the area and the Chemicals of Concern (CoCs) include metals, VOCs, SVOCs, PCRs and PCBs are proposed in the approved CAP agreed by the EPD are extracted as below **Table 2-1**. The assessment areas and sampling locations are shown in **Figure 2-1**.

Table 2-1 Summary of Sampling Points & CoCs proposed in Approved CAP at the Site

Sampling Location ID ¹	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth ¹		Parameters to be Tested
ENV-BH01	Target potential hotspot area at the Chemical Wastes Store	Borehole drilling to 2m below the groundwater table or 6m bgs	Soil	i. 0.5m bgs ¹ ii. 1.5m bgs iii. 3.0m bgs iv. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
			GW	If present ³	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} ,



Sampling Location ID ¹	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth ¹	Parameters to be Tested	
				Metals ^{2a}	
ENV-BH02	Target potential hotspot area at the Dangerous Goods Store		Soil	v. 0.5m bgs ¹ vi. 1.5m bgs vii. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
			GW	If present ³	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
ENV-BH03	Target potential hotspot area at the Chemical Waste Area		Soil	ii. 0.5m bgs ¹ iii. 1.5m bgs iv. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
			GW	If present ³	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
ENV-BH04	Target potential hotspot area at the Scrap Iron Storage Area		Soil	ii. 0.5m bgs ¹ iii. 1.5m bgs iv. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
			GW	If present ³	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
ENV-BH05	Target potential hotspot area at the Chemical Waste Collecting Tank		Soil	ii. 0.5m bgs ¹ iii. 1.5m bgs iv. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
			GW	If present ³	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} ,



Sampling Location ID ¹	Sampling and Testing Rationale	Sampling Method	Sample Matrix/ Depth ¹		Parameters to be Tested
					Metals ^{2a}
ENV-BH06 to BH11	Target potential hotspot area at the Mechanic Workshop		Soil	ii. 0.5m bgs ¹ iii. 1.5m bgs iv. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
				GW	If present ³
ENV-G04, ENV-G07, ENV-G14, ENV-G28	Grid Sampling points for the whole STSTW(280,000m ²)		Soil	ii. 0.5m bgs ¹ iii. 1.5m bgs iv. 3.0m bgs i. 6.0m bgs or at 2m below GW level, which is shallower.	PCR ^{2b} , VOCs ^{2c} , SVOCs ^{2d} , Metals ^{2a}
				GW	If present ³

Remark:

1. bgs refers to below ground surface; GW refers to groundwater
2. Metals:
 - a. For soil: Antimony, Arsenic, Barium, Cadmium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Tin, Zinc, Mercury, Chromium (III) and Chromium (VI);
For groundwater: Mercury
 - b. PCR refers to C6 – C8, C9 – C16 and C17 – C35
 - c. VOCs: Acetone, Benzene, Bromodichloromethane, 2-Butanone, Chloroform, Ethylbenzene, Methyl tert-Butyl Ether, Methylene Chloride, Styrene, Tetrachloroethene, Toluene, Trichloroethene and Xylenes (Total)
 - d. SVOCs:

For soil: Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Bis-(2-ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Hexachlorobenzene, Indeno(1,2,3cd)pyrene, Naphthalene, Phenanthrene, Phenol and Pyrene.

For groundwater: Acenaphthylene, Acenaphthene, Anthracene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, Fluorene, Hexachlorobenzene, Naphthalene, Phenanthrene and Pyrene.

3. Groundwater sample would be collected if encountered.
4. All sampling and testing requirement specified in the CAP shall be followed.

2.2.3 A Land Contamination Assessment was conducted for the EIA of Sha Tin Cavern Sewage Treatment Works (AEIAR-202/2016) to assess the potential land contamination concern at existing STSTW prior to July 2015 by reviewing previous land contamination assessment, site reconnaissance and acquisition of information from government department.

2.2.4 In order to review to confirm the findings in the EIA CAP at the concerned site is still valid after 5 years of approval of the EIA CAP, this SCAP assessed potential land contamination risk by following approaches:

- Review of aerial photos between 2016 and 2020;
- Acquisition of historical Information from Environmental Protection Department (EPD) and Fire Services Department (FSD);
- Conduct site reconnaissance and interview with the land users (DSD).

2.3 Review of Historical Information

Review of Aerial Photographs

2.3.1 Aerial photographic records for the Site between 2016 and 2020 were reviewed to evaluate the likelihood of potential contamination associated with past uses of the Site. The historical land uses identified from the review are summarised in **Table 2-2** and the aerial photographs are provided in **Appendix B**.

Table 2-2 Summary of Historical Land-use at the Site

Year	Landuse / Description	Aerial Photo Ref.
Prior to 2015	<ul style="list-style-type: none"> - Reclamation first appeared in 1974 and completed in around 1981 - No signification change at the assessment area after the construction of the UV disinfection chamber within the Site in 2009. 	Appendix 2.02 of the CAP
2016	<ul style="list-style-type: none"> - Mechanic Workshop, Chemical Waste Store, Scrap Iron Storage Area, Chemical Waste Area, DG/Chemical Waste Store and Final Sedimentation Tanks of Sha Tin Sewage Treatment Works 	E003385C
2019	<ul style="list-style-type: none"> - Mechanic Workshop, Chemical Waste Store, Scrap Iron Storage Area, Chemical Waste Area, DG/Chemical Waste Store and Final Sedimentation Tanks of Sha Tin Sewage Treatment Works 	E063859C
2020	<ul style="list-style-type: none"> - Mechanic Workshop, Chemical Waste Store, Scrap Iron Storage Area, Chemical Waste Area, DG/Chemical Waste Store and Final Sedimentation Tanks of Sha Tin Sewage Treatment Works 	E089853C

2.3.2 The aerial photos taken from 2016, 2019 and 2020 have shown no changes in land use at the Site since 2015 and potential land contamination activities were observed from the aerial photos during 2016 to 2020.

Acquisition of historical Information from EPD and FSD

2.3.3 EPD and FSD were approached to obtain information regarding chemical waste and dangerous goods storage at the Site.

2.3.4 Further to EPD's replies, visit to EPD's Southern Centre Office on 5 July 2021 were made to review the available record of registered Chemical Waste Producers (CWPs) at the Site and a number of registered CWPs were identified at the STSTW, copies of the Chemical Waste Producer records were obtained from DSD for the STSTW and details are summarized in **Table 2-3**. According to the EPD's reply, no record of chemical spillage/leakage or leakage of chemical within the study area for the past 5 years. The EPD's reply was attached in **Appendix C**.

2.3.5 Table 2-3 Summary of CWPs within the Site

CWPs (CWP No.)	Status	Type of Chemical Wastes	Year of Application
Director of Drainage Services (0014-753-D226-10)	Inactive	<ul style="list-style-type: none"> - Spent lubrication oil; - Transformer oil; - Alkaline solution - Battery 	1999
	Active	<ul style="list-style-type: none"> - Spent lubrication oil; - Spent mineral oil; - Unwanted battery; and - Wastes containing lubrication/mineral oil 	2013

2.3.6 Of the above chemicals, lubricating oil, mineral oil is commonly known as land contaminant. Relevant chemicals of concern (COCs) include metals, VOCs, PAHs, PCRs and PCBs.

2.3.7 FSD also replied no records of dangerous good license, fire incidents and spillage/leakage of dangerous good were found in the Site and details are summarized in **Table 2-4**. The FSD's reply was attached in **Appendix C**.

Table 2-4 Summary of Dangerous Goods & Incident Records

No.	Type of DG	Quantity	Store Locations
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1.	Cat. 3 Sodium Hydroxide Solution	10,000 Litres	Sha Tin Sewage Treatment Works
2.	Cat. 4 Sodium Hypochlorite Solution	7.85 m ³	Sha Tin Sewage Treatment Works
3.	Cat. 4 Sodium Hypochlorite Solution	7.85 m ³	Sha Tin Sewage Treatment Works

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

Interview with the Site owner (DSD)

2.3.9 Interview with Site owner (DSD) was conducted for obtaining information and history of the Site. The completed questionnaire used during the Site walkover and interview is provided in **Appendix D**.

2.4 Site Walkover

Site Description and Surrounding

2.4.1 The total site area of existing STSTW is approximately 280,000m² and it is located at No. 1 Shui Chong Street, Shatin as shown in **Figure 1-1**. Total 4 nos. of “U1” grids were covered in this SCAP, each grid was 100 x 100m as demarcated in the approved CAP. A number of existing buildings and structures are within the “U1” grids, namely, Administration Building, CLP’s Transformer No.1, 19 & 20, Final Sediment Tanks, Mechanic Workshop, Dangerous Goods Store, Chemical Waste Store, Scrap Iron Storage Area, Chemical Waste Collecting Tank and Chemical Waste Area.

2.4.2 Surrounding land uses of STSTW are summarised as below **Table 2-5**.

Table 2-5 Surrounding Land use of the Site

Direction	Land-use
North	Police Station, Hotel and The Chinese University of Hong Kong
South	Hong Kong Jockey Club Stable
East	Shing Mun River
West	Industrial (MTR and Highway)

Site Walkover on 3 June 2021

2.4.3 A joint site walkover among Resident Site Staff (RSS) and the DSD’s representative was conducted on 3 June 2021 to gather information regarding the existing condition of the Site as well as its enviros to confirm any potential land contamination source. No underground structure was observed during the inspection, which is tally with the as-built drawings.

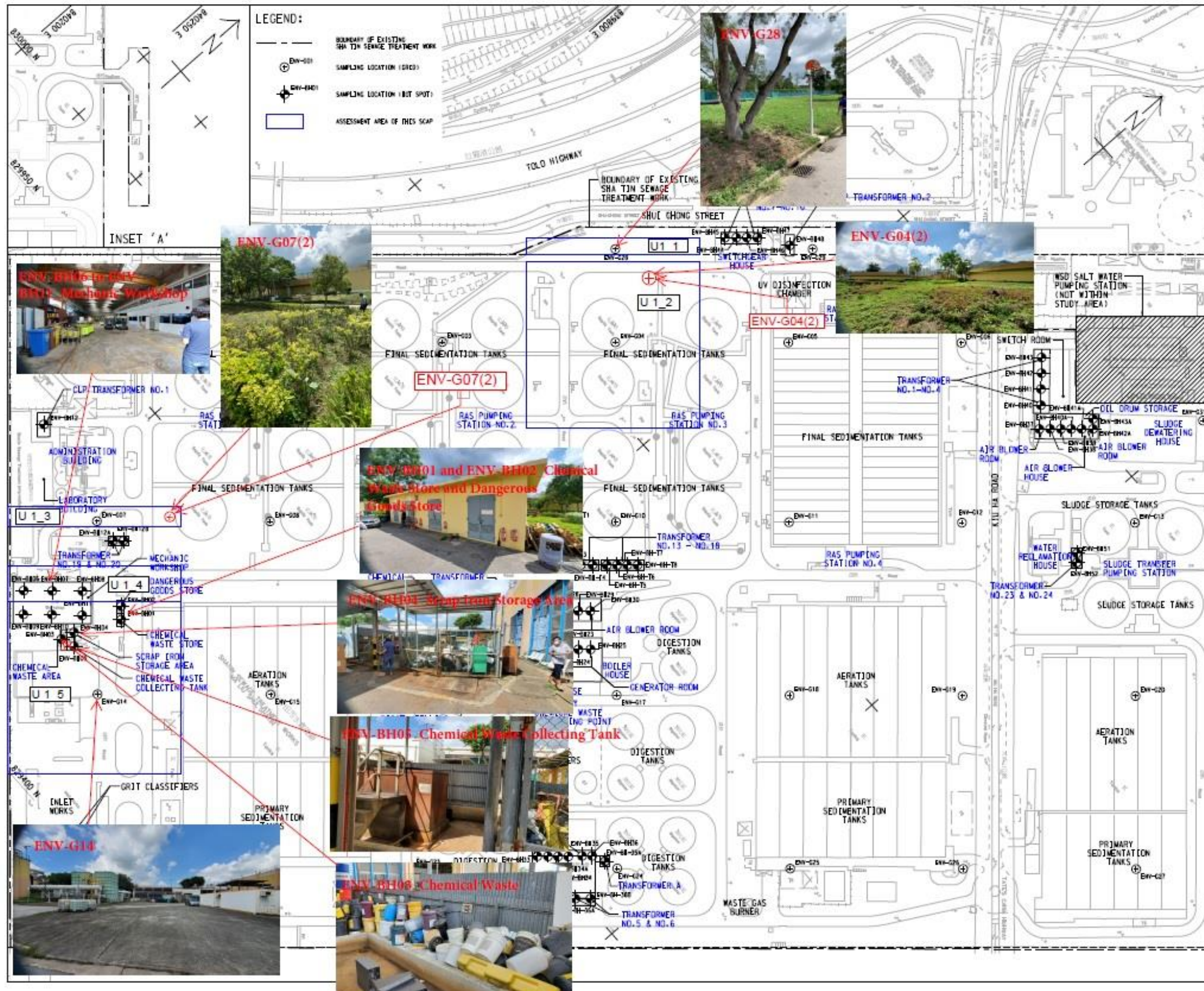


- 2.4.4 Mechanic Workshop, Dangerous Goods Store, Chemical Waste Store, Scrap Iron Storage Area, Chemical Waste Collecting Tank and Chemical Waste Area were visited to identify the current use and condition. According to the Resident Site Staff (RSS) and the DSD's representative, a number of hotspots, including, for example, workshop, used battery, diesel tanks and chemical / chemical waste storage area, were identified during the site walkover. The ground is concrete paved and observed in good condition without stain. There could be potential land contamination risk if the underlying soil / groundwater were contaminated during the handling and storage of hazardous substances.
- 2.4.5 Findings from the site walkover are summarised in **Table 2-6** and the corresponding photo records are shown in **Appendix E**.

Table 2-6 Summary of Site Walkover Findings

Floor Level	Inspected Area	Findings	Rationale for Need of Intrusive Site Investigation (S.I.)	Require S.I.?	Representative Sampling Location(s)	Photo Ref. in Appendix E
G/F	Chemical Wastes Store (26 m ²)	<ul style="list-style-type: none"> - Empty chemical containers are stored on shelf in the Chemical waste store. The floor of the store is concrete paved and were observed in good condition without stain. - Chemicals observed included spent acid and alkali. 	1 sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV-BH01	Photo 1
	Dangerous Goods (DG) Store (28 m ²)	<ul style="list-style-type: none"> - No report of spillage or leakage of dangerous goods from FSD records. - The floor of the DG Store is concrete paved and was observed in good condition without stain. - The DG containers are observed to be in good condition. - Chemicals stored include Sodium Hypochlorite Solution, thinner and paints. 	1 sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV-BH02	Photo 1 to Photo 3
	Chemical Waste Area (42 m ²)	<ul style="list-style-type: none"> - The Chemical Waste Area has a metal roof and the floor of the area is concrete paved with bunding. The concrete pavement and bunding are in good condition without stain. - Empty lubrication oil, grease container, bleach drum and waste battery are temporary stored in the area until collection by registered chemical waste collector. 	1 sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV_BH03	Photo 4
	Scrap Iron Storage Area (21m ²)	<ul style="list-style-type: none"> - Metal scraps such as machine parts are temporary stored in this area till collection by contractor. The area is paved with intact concrete. - Concrete floor was observed in good condition without crack. 	1 sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV-BH04	Photo 5
	Chemical Waste Collecting Tank (34 m ²)	<ul style="list-style-type: none"> - The chemical waste collecting tank is placed on top of a concrete paved area with concrete bunding to prevent spilling and leakage. - Chemical containers and oil drums would be emptied to this collecting tank before placing them in the chemical waste store and chemical waste area. - Concrete floor was observed in good condition without crack and oil stains. 	1 sampling location proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV-BH05	Photo 6
	Mechanic Workshop (1,090 m ²)	<ul style="list-style-type: none"> - The workshop is concrete paved with no oil stain observed. Repair and maintenance of valve bodies, spindles pups and other light machine take place in the workshop. - Typical maintenance may include greasing and lubrication involving lubrication oil. 	6 sampling locations proposed. COCs includes metals, VOCs, SVOCs and PCRs.	Yes	ENV-BH06 to ENV-BH11	Photo 7 to Photo 8

Figure 2-1 Assessment Areas and Sampling Locations



3. Sampling and Testing Plan for Site Investigation

3.1 Location of Site Investigation

Mechanical Workshop

3.1.1 According to the approved CAP, 6 hotspot sampling point – ENV-BH6 to ENV-BH11 were proposed to study the target hotspot area at the Mechanic Workshop. The locations of ENV-BH6 to ENV-BH11 are indicated in the location plan at **Appendix A**.

Chemical Waste Area, Scrap Iron Storage Area and Chemical Waste Collection Tank

3.1.2 According to the approved CAP, 3 hotspot sampling point – ENV-BH3 to ENV-BH5 were proposed to study the target potential hotspot area at the Chemical Waste Area, Scrap Iron Storage Area and Chemical Waste Collection Tank. The locations of ENV-BH3 to ENV-BH5 are indicated in the location plan at **Appendix A**.

Dangerous Goods and Chemical Waste Store

3.1.3 According to the approved CAP, 2 hotspot sampling point – ENV-BH1 and ENV-BH2 were proposed to study the target potential hotspot area at Dangerous Goods and Chemical Waste Store. The locations of ENV-BH1 and ENV-BH2 are indicated in the location plan at **Appendix A**.

Grid sampling at ENV-G04

3.1.4 According to the approved CAP, a 100 x 100m regular grid sampling arrangement was proposed to study the vertical profile of possible contamination within the existing STSTW. This SCAP covered the study area of grids ENV-G04 and grid soil sampling shall be conducted for this grid. After reviewing the actual site conditions, the proposed grid sampling points of ENV-G04 are located at a final sedimentation tank. The final sedimentation tank will still be operated for a while and will not be demolished in a short period. In view of the above, an alternative grid sampling point ENV-G04 (2) is proposed and indicated in the location plan at **Appendix A**.

Grid sampling at ENV-G07

3.1.5 According to the approved CAP, a 100 x 100m regular grid sampling arrangement was proposed to study the vertical profile of possible contamination within the existing STSTW. This SCAP covered the study area of grids ENV-G07 and grid soil sampling shall be conducted for this grid. After reviewing the actual site conditions, the grid sampling point – ENV-G07 is very close to existing building structure. An alternative grid sampling point ENV-G07 (2) is proposed and indicated in the location plan at **Appendix A**.

Grid sampling at ENV-G14

3.1.6 According to the approved CAP, a 100 x 100m regular grid sampling arrangement was proposed to study the vertical profile of possible contamination within the existing STSTW. This

SCAP covered the study area of grids ENV-G14 and grid soil sampling shall be conducted for this grid.

Grid sampling at ENV-G28

3.1.7 According to the approved CAP, a 100 x 100m regular grid sampling arrangement was proposed to study the vertical profile of possible contamination within the existing STSTW. This SCAP covered the study area of grids ENV-G28 and grid soil sampling shall be conducted for this grid.

3.1.8 The CoCs proposed in the approved CAP agreed by the EPD for laboratory analysis are extracted as **Table 2-1**.

3.2 Proposed Sampling Method and Depth of Sampling

Soil Sampling

3.2.1 All sampling and testing requirement specified in the CAP shall be followed. The CAP proposed that all soil boring / excavation and sampling shall be supervised by a land contamination specialist to oversee all soil sampling and determine the appropriate depth at each sampling point with respect to the actual site conditions. He/she is required to supervise soil and field reporting as stated in Section 3.3.1 and Section 3.6 of Practice Guide (e.g. soil profiling, sign of contamination, groundwater level, presence of non-aqueous phase liquid). Boreholes sampling shall be conducted by dry rotary drilling to prevent cross-contamination by flushing medium during sampling. An inspection pit shall be developed to 1.5m below ground level (m bgl) to identify any underground utilities at all sampling locations for safety reasons and a disturbed soil shall be collected at depth of 0.5m bgl from the inspection pit by using stainless steel hand tools or other appropriate equipment. Undisturbed U100/U76 soil sampling shall then be collected from 1.5m, 3.0m and 6.0m or at 2m below groundwater level, whichever is shallower.

3.2.2 If drilling of borehole are considered not possible (e.g. presence of underground utilizes, limitation of headroom space, etc.), a trial pit shall be developed to 3m bgl. Disturbed soil sampling shall be collected at 0.5m, 1.5m and 3.0m below ground level at the trial pit to delineate the vertical contamination profile.

3.2.3 Sufficient amount of soil samples should be taken as required by the laboratory for analyses of the specified parameters. Backup samples shall be kept. All soil samples shall be properly labelled.

3.2.4 Strata logging for the borehole shall be conducted by a qualified geologist during drilling/digging at all sampling locations. The strata log shall include the general stratigraphic description, depth of soil samples taken, 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 in the log.

Groundwater Sampling and Free Product Measurement

- 3.2.5 If groundwater is encountered, groundwater samples should be taken for laboratory analysis.
- 3.2.6 Groundwater sampling well should be installed if groundwater is encountered unless agreed otherwise by the land contamination specialist. The typical design of the groundwater sampling well was proposed in the CAP and extracted in **Appendix F**. After installation of the monitoring well, groundwater levels (metres below ground level) should be measured with an interface probe to assess groundwater gradient and predominant direction.
- 3.2.7 Thickness of any Non-aqueous Phase Liquid (NAPL) or free product layer floating on top of the groundwater shall be measured and recorded before groundwater samples are taken, if present. A sample should be collected for analysis the composition of such layer in laboratory if encountered.
- 3.2.8 If groundwater is encountered for trial pit sampling method, groundwater sample shall be taken after collecting all required soil samples. The trial pits shall be pumped to near dry and allowed to recharge for 24 hours before sampling.
- 3.2.9 Before groundwater sampling, the monitoring wells should be purged in order to remove fine-grained materials and to freshly refill representative groundwater samples.
- 3.2.10 Groundwater sample shall be collected using Teflon bailer and decanted immediately into appropriate sample containers provided by the laboratory to minimise agitation and volatilization of VOCs from the samples. After sample collection, samples shall be stored at temperature of about 0-4°C until delivered to laboratory.

3.3 Sampling, Handling and Transport of Samples

- 3.3.1 All sampling equipment should be thoroughly decontaminated by washing with phosphate-free detergent and rinsed with distilled/deionised water prior to sampling and between drilling, digging and sampling event to prevent cross contamination of samples.
- 3.3.2 Following sampling, samples should be stored in a cool box at a temperature of between 0°C and 4°C and transported to the laboratory within the sample retention time, as advised by the laboratory.

3.4 QA/QC Procedures

- 3.4.1 For the field QA/QC samples, the followings shall be followed:
- 1 duplicate soil sample per 20 soil samples and 1 duplicate groundwater sample per 20 groundwater samples for analysis of same parameters as shown in **Table 2-1**.
 - 1 field blank per 20 samples for analysis of same parameters as shown in **Table 2-1**.



- 1 equipment sample shall be collected per 20 samples for analysis of same parameters as shown in **Table 2-1**.
- 1 trip blank sample per 10 trips for petroleum carbon range C6-C8.

3.4.2 Supporting documentation, including Chain-of-Custody Procedures, Data Quality Objectives and Quality Assurance/Quality Control, shall be maintained by the project proponents and shall be submitted to EPD when required.

3.5 Laboratory Analytical Requirements

3.5.1 The CAP recommended the reporting limits and reference methods for the laboratory analyses of soil and groundwater samples for the COCs under this land contamination assessment. The schedule for laboratory analysis is listed in **Table 3-1**:

Table 3-1 Parameters, Reporting Limits and Reference Methods for Laboratory Analysis

Parameters	Soil Reporting Limit (mg/kg)	Reference Test Method	Groundwater Reporting Limit (µg/L)	Reference Test Method
SVOCs				
Acenaphthene	0.5	USEPA 8270 or equivalent method*	2	USEPA 8270 or equivalent method*
Acenaphthylene	0.5		2	
Anthracene	0.5		2	
Benzo(a)anthracene	0.5		NA	
Benzo(a)pyrene	0.5		NA	
Benzo(b)fluoranthene	0.5		1	
Benzo(g,h,i)perylene	0.5		NA	
Benzo(k)fluoranthene	0.5		NA	
bis-(2-Ethylhexyl)phthalate	5		NA	
Chrysene	0.5		1	
Dibenzo(a,h)anthracene	0.5		NA	
Fluoranthene	0.5		2	
Fluorene	0.5		2	
Hexachlorobenzene	0.2		4	
Indeno(1,2,3-cd)pyrene	0.5		NA	
Naphthalene	0.5		2	
Phenanthrene	0.5		2	
Phenol	0.5		NA	
Pyrene	0.5		2	
VOCs				
Acetone	50	USEPA 8260 or equivalent method*	500	USEPA 8260 or equivalent method*
Bromodichloromethane	0.1		5	
2-Butanone	5		50	
Chloroform	0.04		5	
Methyl tert-Butyl Ether	0.5		5	
Methylene Chloride	0.5		50	
Styrene	0.5		5	
Tetrachloroethene	0.04		5	
Trichloroethene	0.1		5	
Benzene	0.2		5	



Parameters	Soil Reporting Limit (mg/kg)	Reference Test Method	Groundwater Reporting Limit (µg/L)	Reference Test Method
Toluene	0.5		5	
Ethylbenzene	0.5		5	
Xylenes	2		20	
Metals				
Antimony	1	USEPA 6020A or equivalent method*	NA	NA
Arsenic	1		NA	NA
Barium	1		NA	NA
Cadmium	0.2		NA	NA
Chromium III [^]	1	By calculation	NA	NA
Chromium VI	1	USEPA 3060 APHA 3500 Cr: D or equivalent method*	NA	NA
Cobalt	1	USEPA 6020A or equivalent method*	NA	NA
Copper	1		NA	NA
Lead	1		NA	NA
Manganese	1		NA	NA
Mercury	0.05		0.5	USEPA 6020A or equivalent method*
Molybdenum	1		NA	NA
Nickel	1		NA	NA
Tin	1		NA	NA
Zinc	1	NA	NA	
Petroleum Carbon Ranges (PCRs)				
C6 - C8	5	USEPA 8015/8260 or equivalent method*	20	USEPA 8015/8260 or equivalent method*
C9 - C16	200		500	
C17 - C35	500		500	

Notes:

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

3.6 Health and Safety Precautions

3.6.1 All health and safety recommendations specified in the CAP shall be implemented.



- 3.6.2 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;
 - d. Availability of and instruction in the location, use and maintenance of personal protective equipment;
 - e. Any abnormal conditions found shall be reported immediately to the safety officer and the land contamination specialist.
- 3.6.3 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. The following measures were recommended in the CAP and shall be implemented, but not limited to, for minimising the risk to field personnel during SI:
- a. Maintain proper safety devices, barriers to minimise hazards during performance of the work;
 - b. Prohibit smoking and open flames and the carrying of matches and lighters;
 - c. Develop and maintain a written emergency plan applicable to the Work and Site;
 - d. Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;
 - e. Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;
 - f. Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for existing work, weather and environmental conditions; and
 - g. The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.
- 3.6.4 Workmen Compensation Insurance and third party insurance must be provided for the SI work.



4. Interpretation of Results for Site Investigation

4.1 Future Land Use and Land Use Scenarios of the Site

4.1.1 As confirmed with the DSD, the assessment area covered in this SCAP will be developed into workshops, office, new sewage treatment facilities and DG store. Area of U1_1, U1_3, U1_4 and U1_5 are intended to be developed into workshops, new sewage treatment facilities and DG store and the criteria of industrial land use is considered appropriate for such landuse, while the U1_2 is intended to be developed into office and the criteria of urban residential landuse is considered appropriate for such landuse. The assessment criteria for each assessment area is summarised as below **Table 4-1**. A tentative redevelop plan has been provided in **Appendix G** for reference.

Table 4-1 Assessment Criteria for Each Assessment Area of U1_1, U1_2, U1_3, U1_4 and U1_5

Assessment Area	Tentative Future Landuse	Appropriate Land Use Scenario
U1_1	Workshop	Industrial
U1_2	Office	Urban Residential
U1_3	DG store	Industrial
U1_4	New sewage treatment facilities	Industrial
U1_5	New sewage treatment facilities	Industrial

5. Conclusion

- 5.1.1 This SCAP was prepared to conduct a review to confirm the findings in the EIA CAP at the Site is still valid after 5 years of approval of the EIA CAP. DSD intends to redevelop part of the existing DSD STSTW Site (total 5 nos. marked with "U1_1 to U1_5" in **Figure 1-1**, the Site) into workshops, new sewage treatment facilities and DG store. This SCAP only covers the assessment of those area and subsequent SCAP(s) for the existing STSTW will be submitted prior to demolition. Site location map is shown in **Figure 1-1**.
- 5.1.2 In this study, site appraisal was conducted to identify potential land contamination sources/hotspot in the Site by site inspection on 3 June 2021, review of aerial photos, obtaining information from government departments and interview with the land owner. Also, the findings on land contamination issues prior to 2016 from EIA CAP was also reviewed to obtain the information prior to 2016 for the Site. Based on the findings of the CAP for the Site and this SCAP, a programme, targeting the Chemical Waste Area, Chemical Waste Collection Tank, Scrap Iron Storage Area had been proposed. A total of 3 hotspot locations and 4 grid sampling locations were proposed for soil and groundwater sample collection in this stage. The collected samples will be tested for the COCs: SVOCs, VOCs, metals and petroleum carbon ranges. The study area is considered valid.
- 5.1.3 According to Section 7.1.1.4 of the CAP, no construction works or development shall be carried out within the Site prior to the approval of the Contamination Assessment Report (CAR) or Remediation Report (if necessary).
- 5.1.4 A CAR shall be prepared following the site investigation work at all sampling locations. The CAR should present the detailed methodology, observations and the analytical results from the site investigation works. The CAR shall be submitted for EPD endorsement.
- 5.1.5 If contamination is confirmed, strategies for remediation of the Site shall be recommended in a Remediation Action Plan (RAP), to be prepared by the Contamination Specialist. The RAP shall be submitted for EPD endorsement.

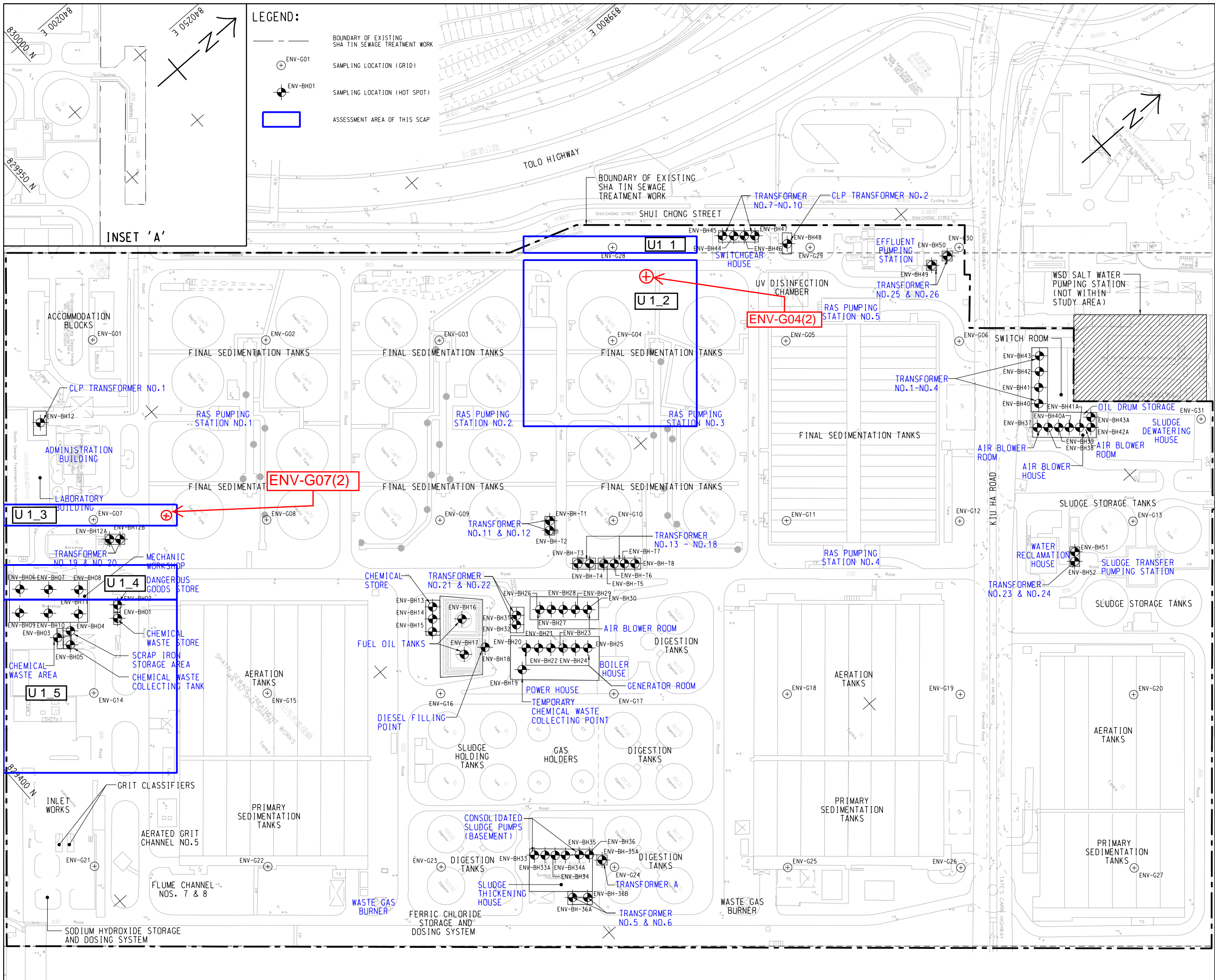


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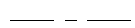



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Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix A

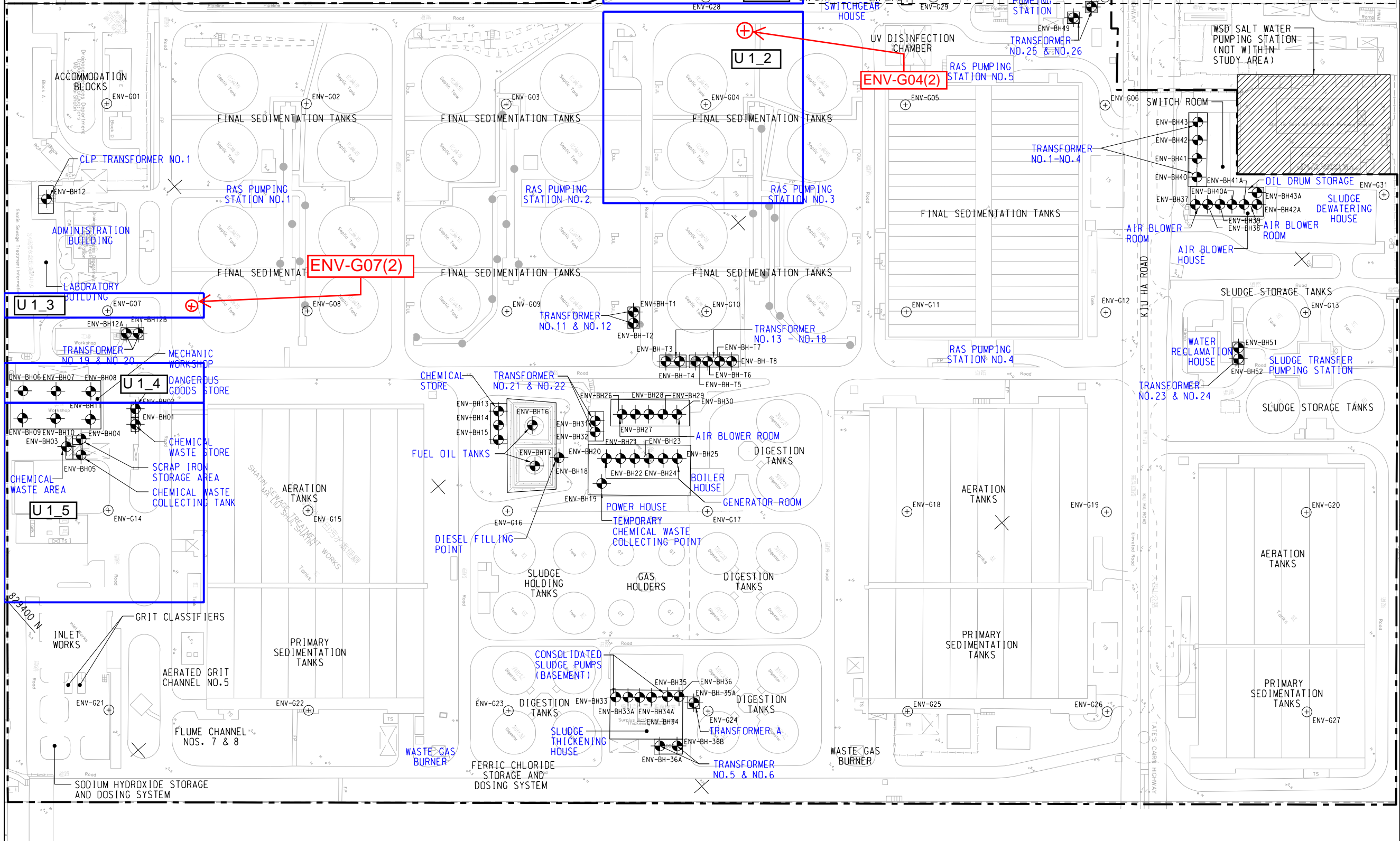
Location Plan of Sampling Locations



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-  BOUNDARY OF EXISTING SHA TIN SEWAGE TREATMENT WORK
-  ENV-G01 SAMPLING LOCATION (GRID)
-  ENV-BH01 SAMPLING LOCATION (HOT SPOT)
-  ASSESSMENT AREA OF THIS SCAP

INSET 'A'





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Appendix B1

Aerial Photos Extracted from the CAP



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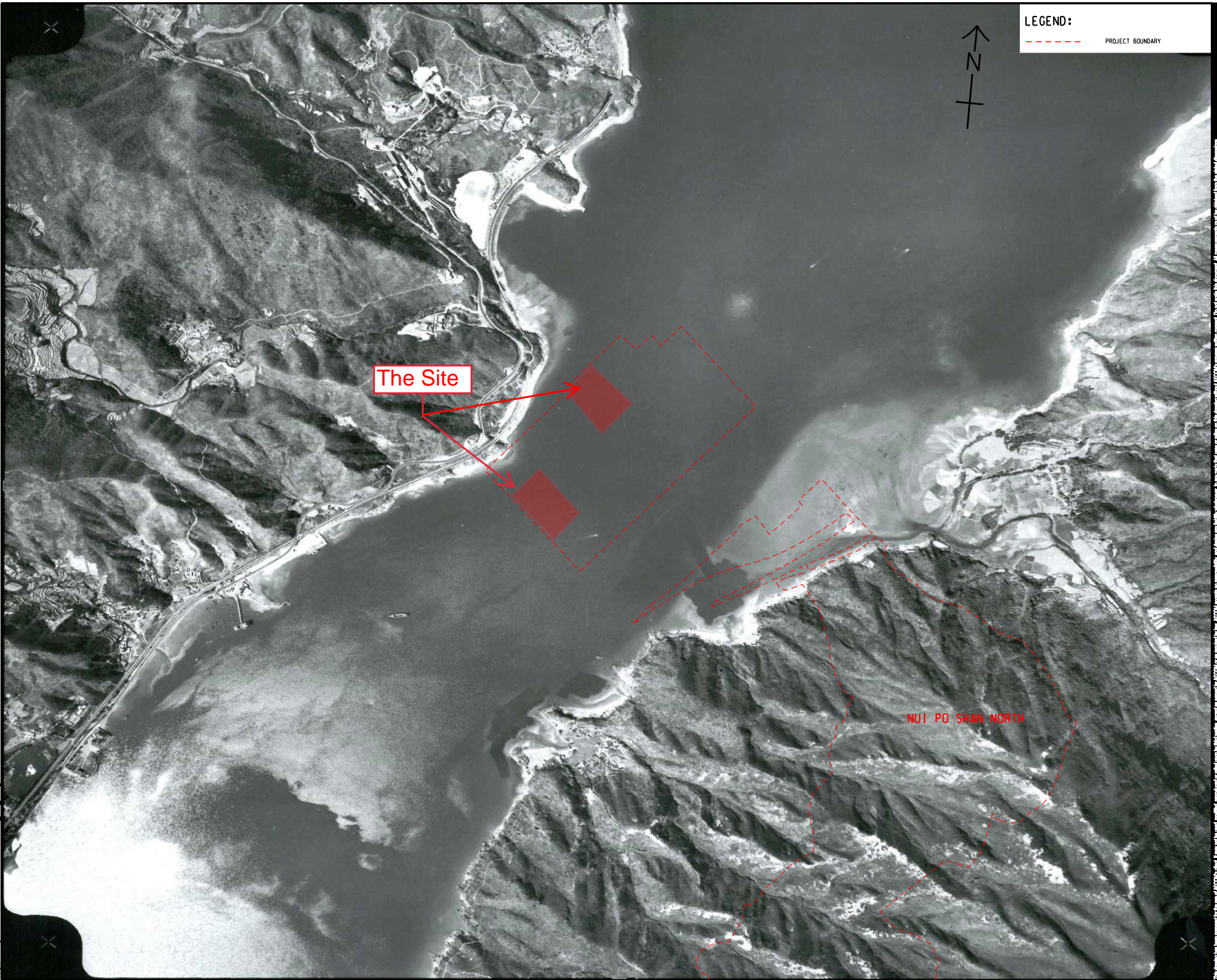
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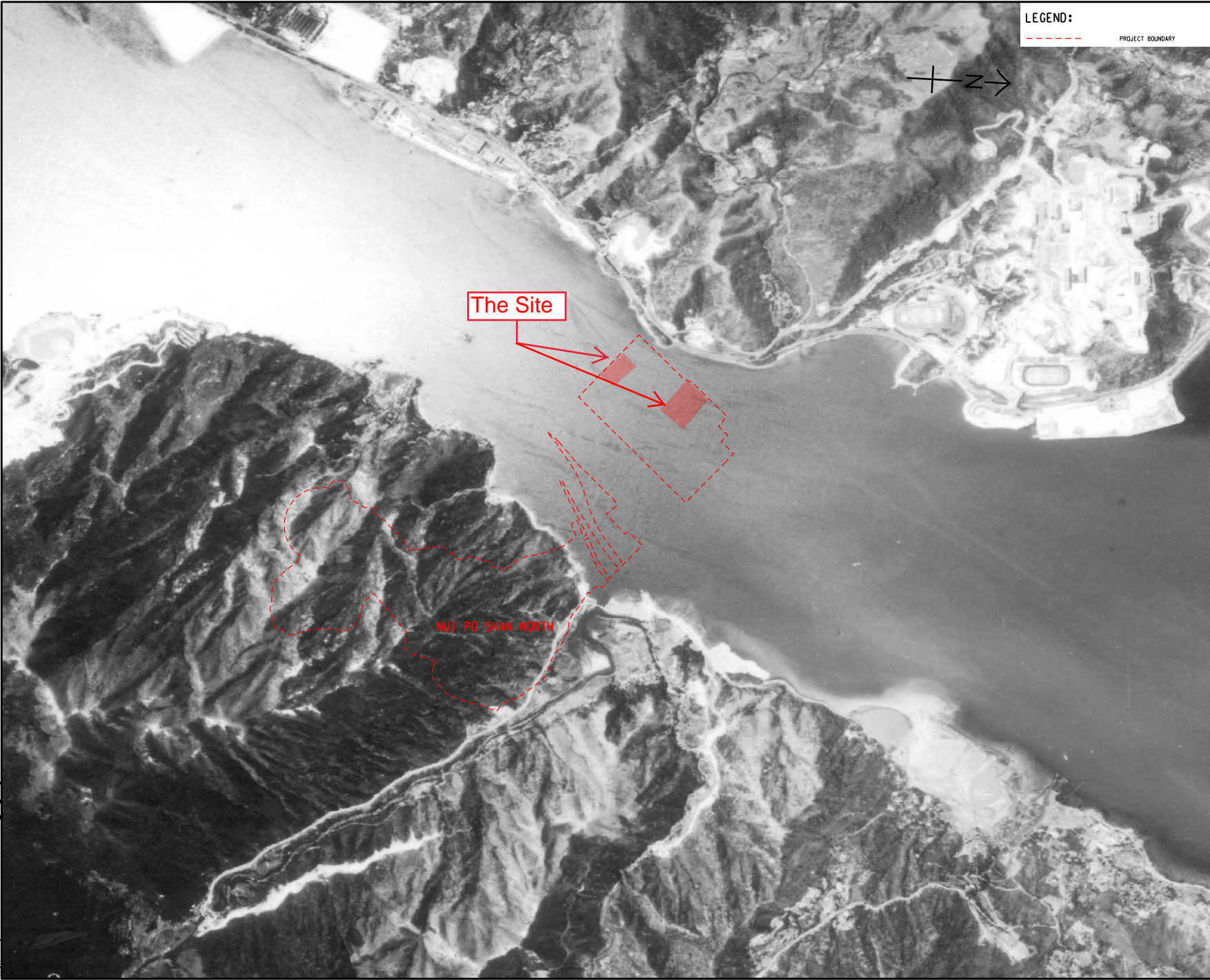
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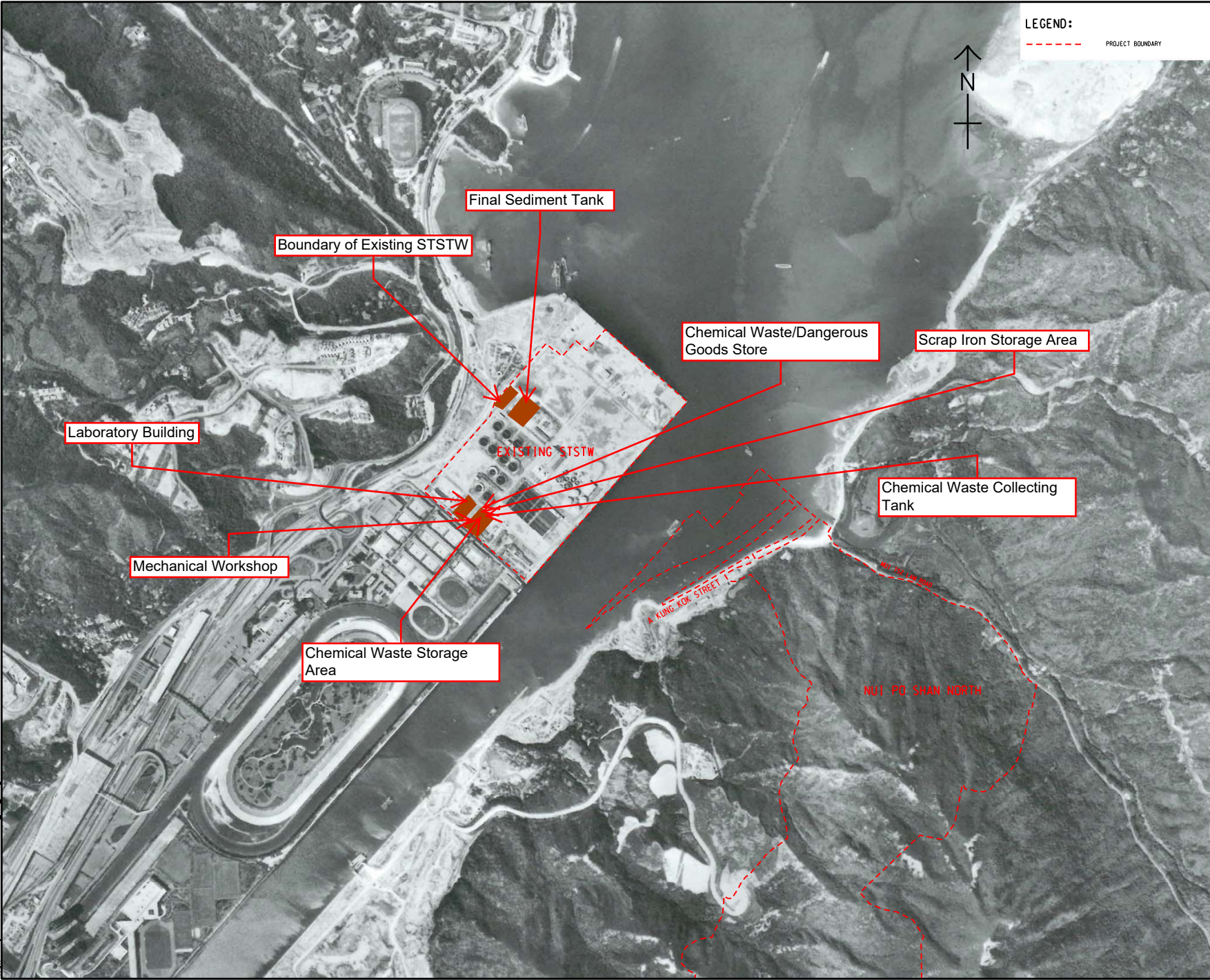
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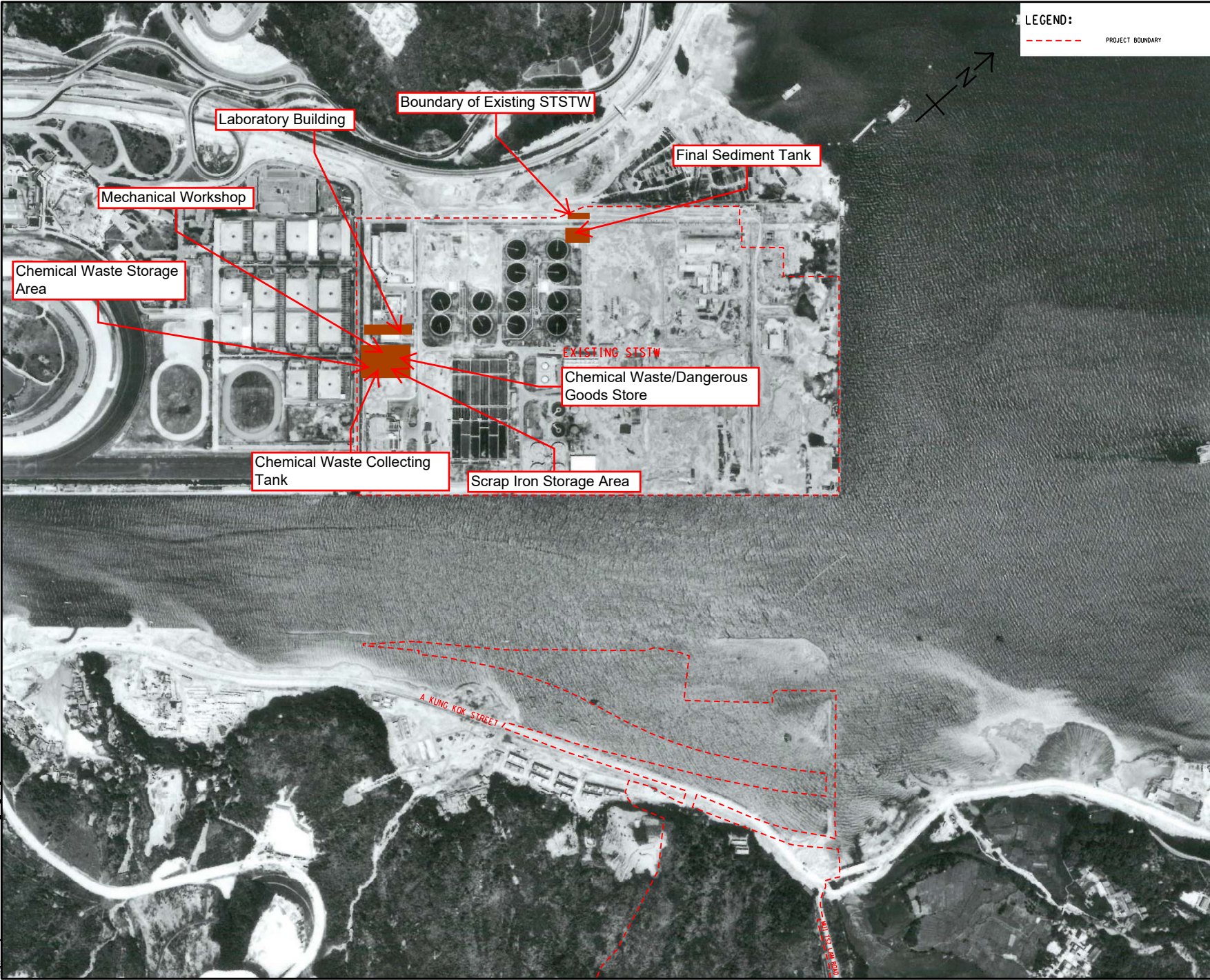
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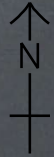
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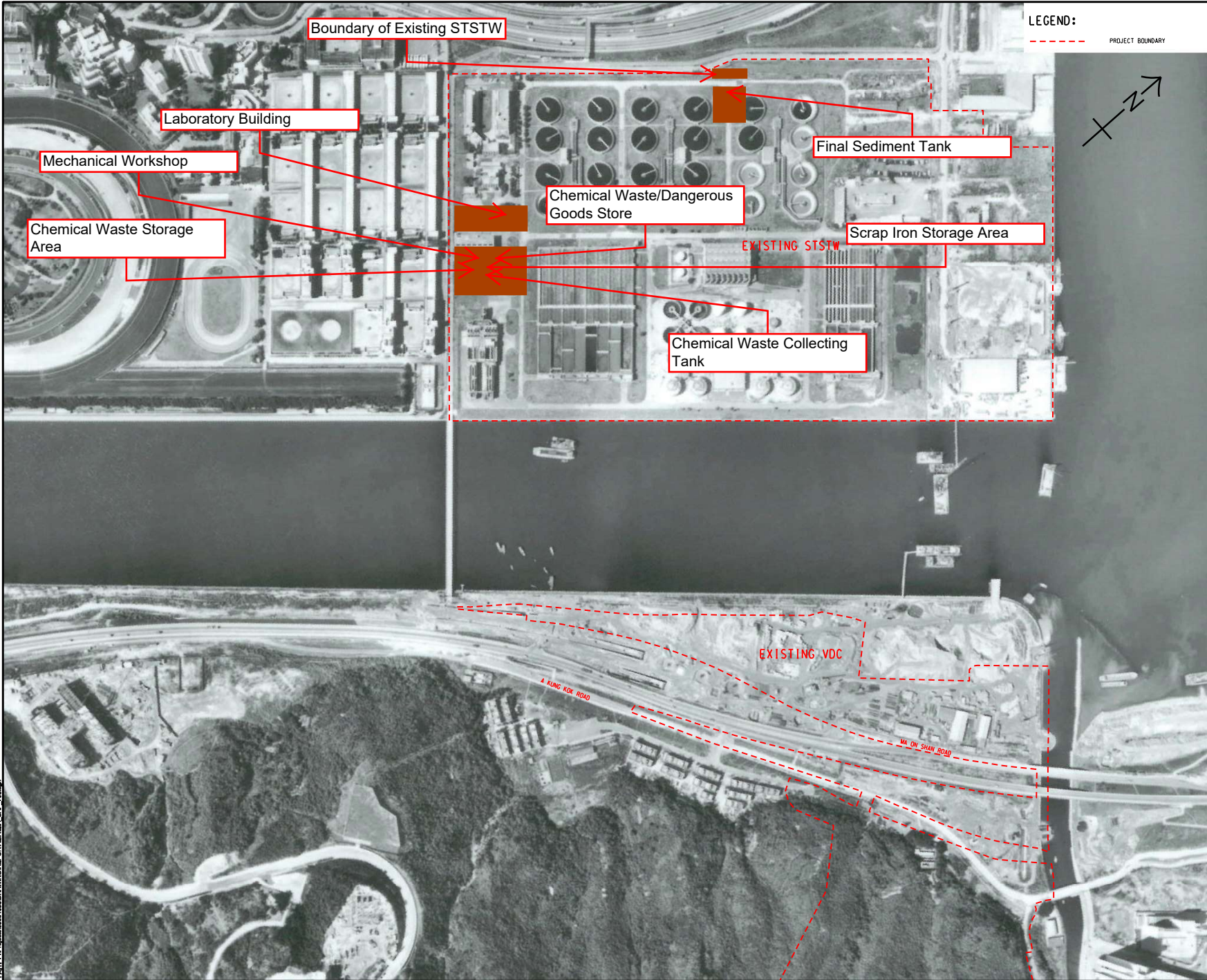
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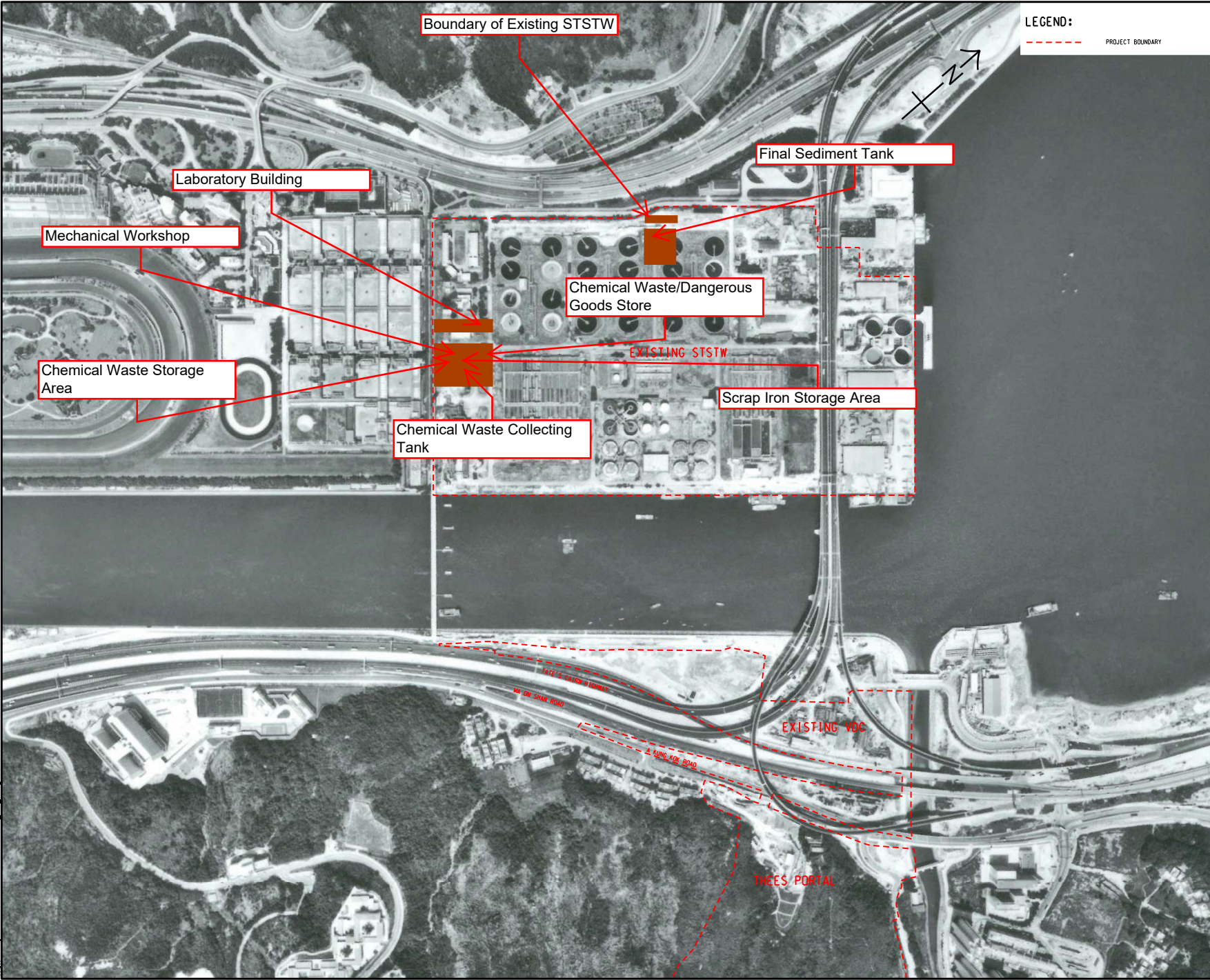
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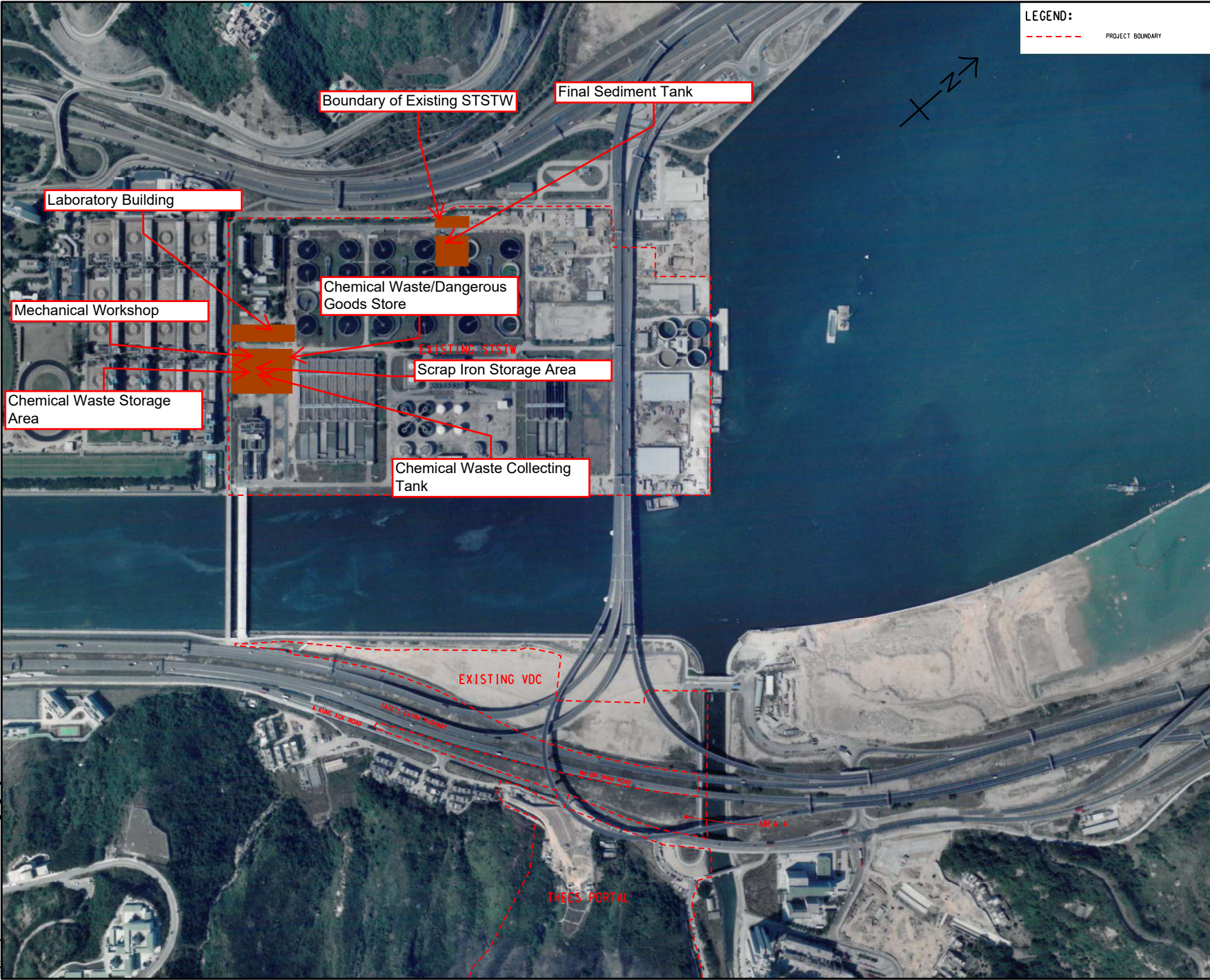
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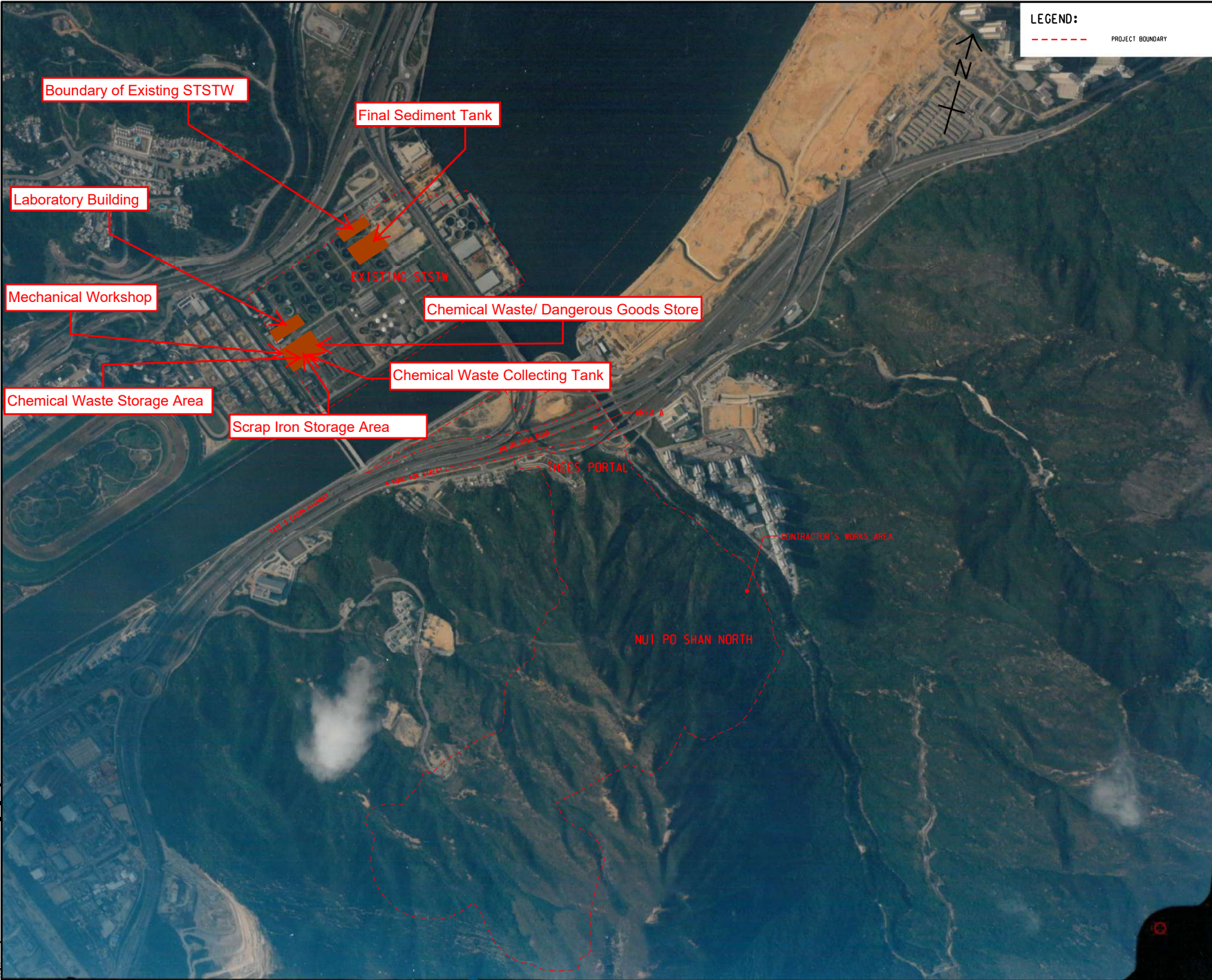
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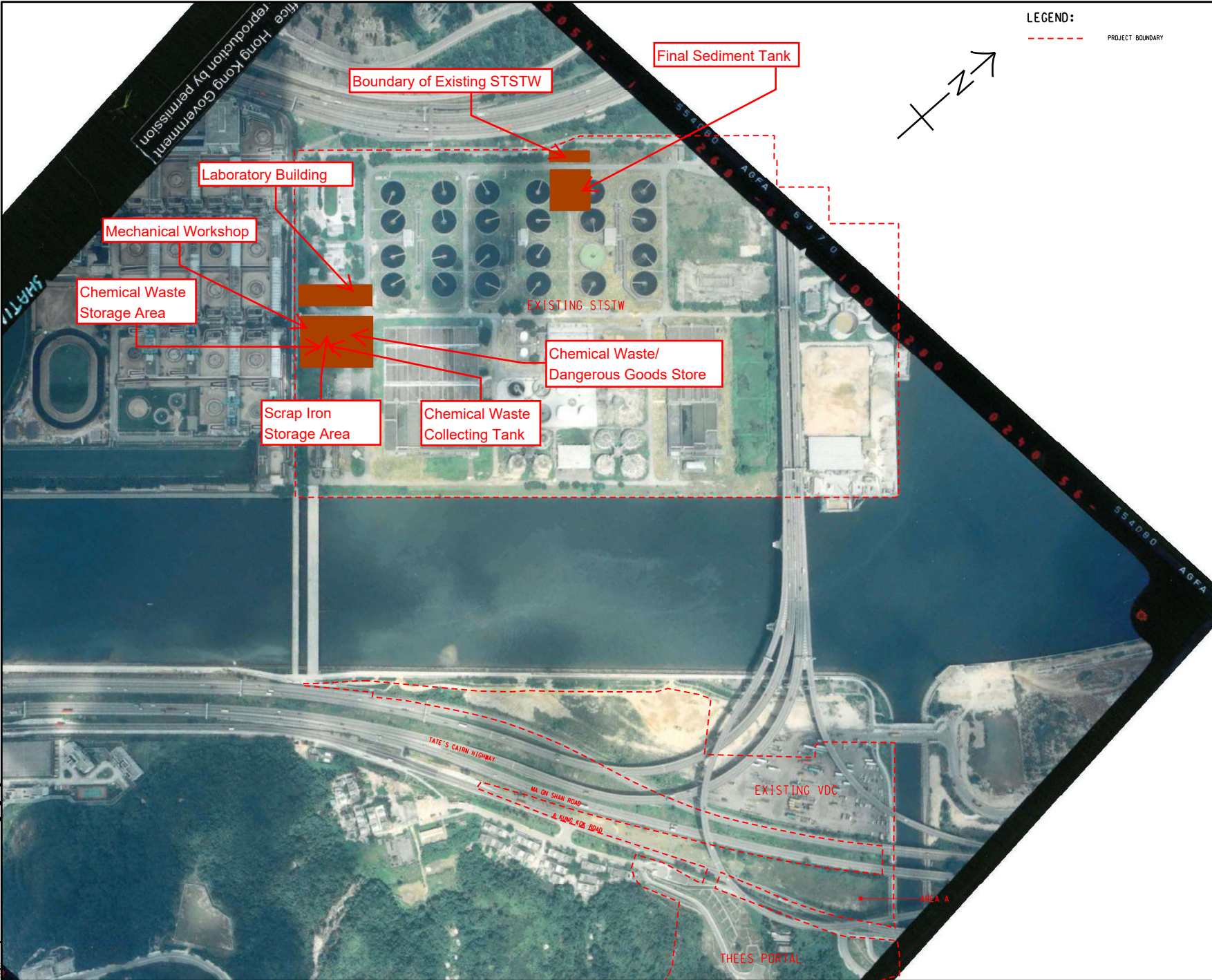
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PROJECT
 RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS: CAVERNS AND SEWAGE TREATMENT WORKS - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
 Drainage Services Department

CONSULTANT
 AECOM Asia Company Ltd.
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SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.
B	MAR. 16	EIA	
A	JAN. 16	EIA	
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STATUS

SCALE
 A1 : 2000
KEY PLAN

DIMENSION UNIT
 METRES

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Project Management Initials: Designer: Checker: Approved: ISO A1 84mm x 84mm
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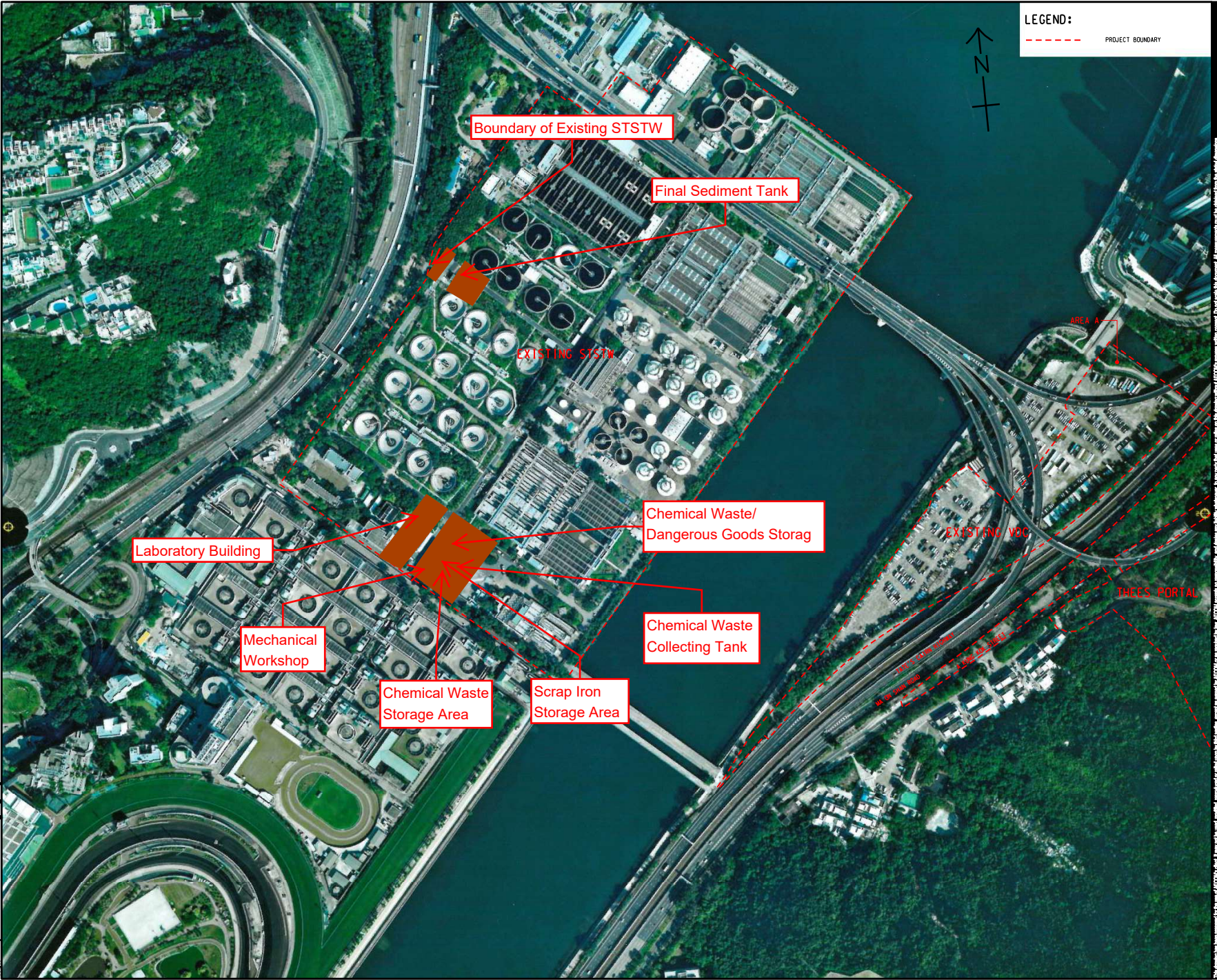
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 METRES

KEY PLAN

PROJECT NO. 60334056
CONTRACT NO. CE 30/2014 (DS)

SHEET TITLE
 AERIAL PHOTOGRAPH (2004)

SHEET NUMBER
 60334056/CAP/2004B



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STATUS

SCALE
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KEY PLAN

DIMENSION UNIT
 METRES

PROJECT NO.
 60334056

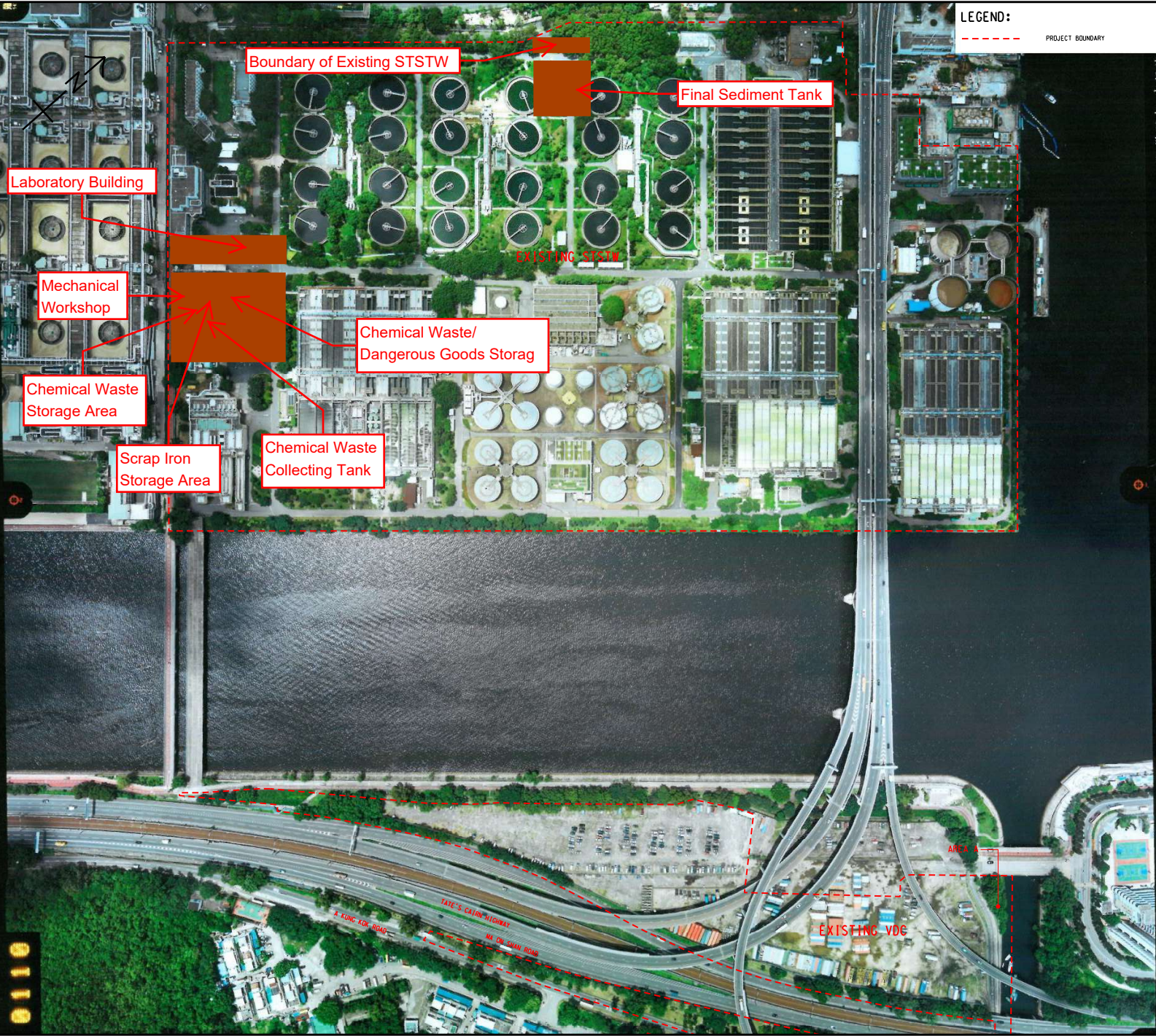
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 The Government of Hong Kong Special Administrative Region
 香港特別行政區政府 地政總署測繪處



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PROJECT
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CLIENT
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 Drainage Services Department

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STATUS

SCALE
 A1 1:1500
SCALE UNIT
 METRES

KEY PLAN

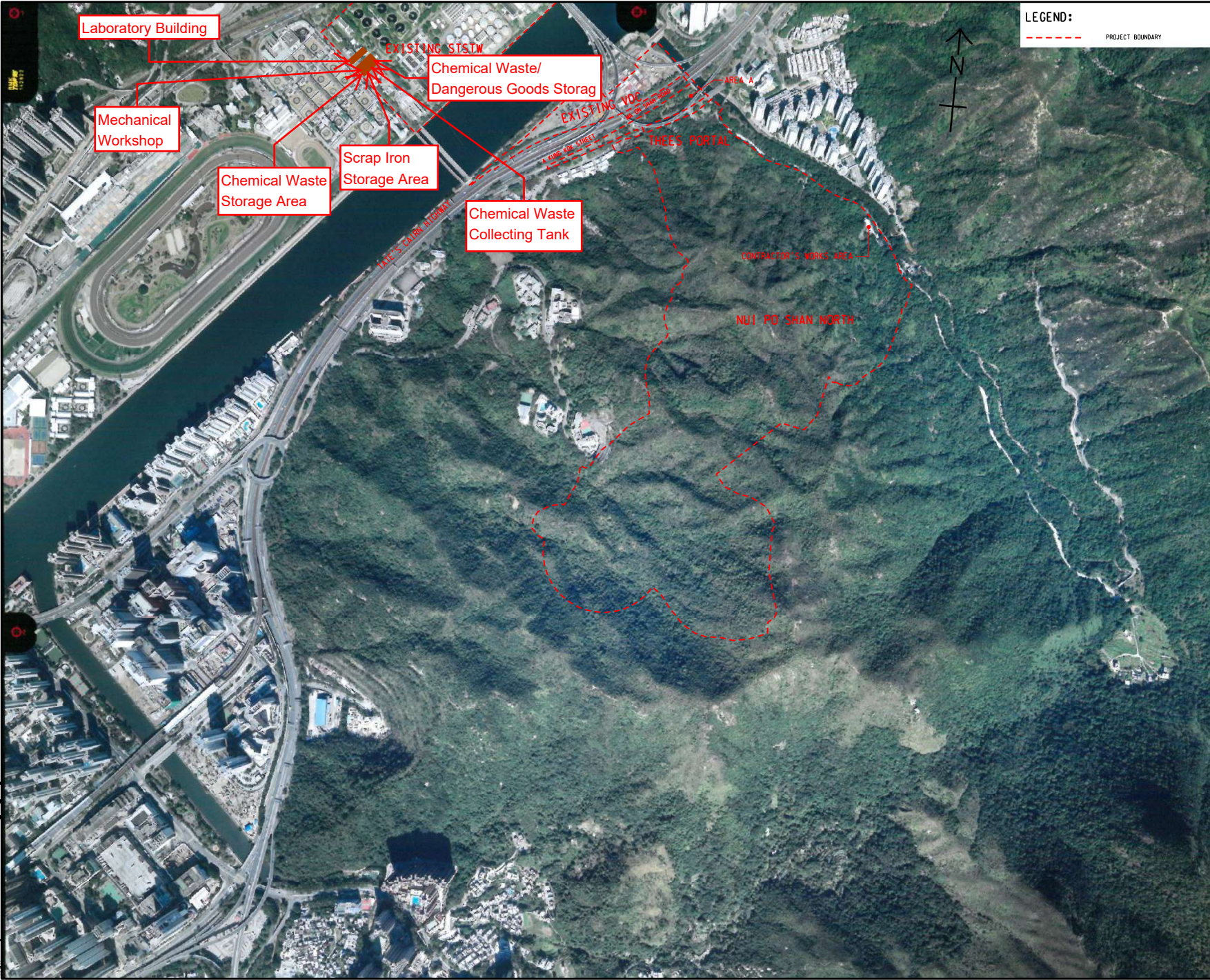
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 Approved:
 Checked:
 Designer:
 Project Management Initials:
 2016/02/22
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 P:\16\02\22\20160222\20160222\REPORT\EA\EA_CAP_713.dgn



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 - - - - - PROJECT BOUNDARY



PROJECT
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SCALE
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DIMENSION UNIT
 METRES

KEY PLAN

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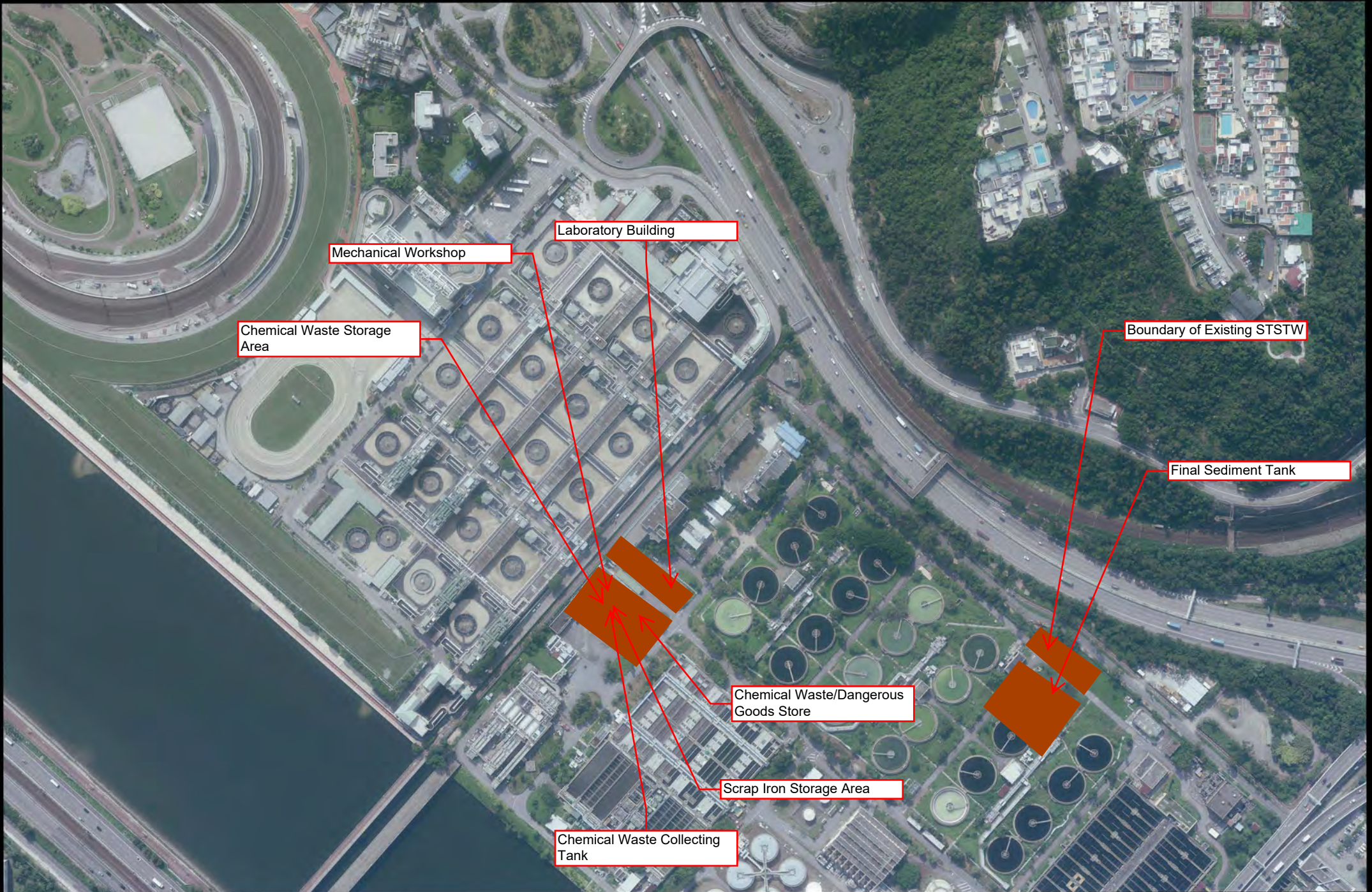
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Drainage Services Department
Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix B2

Aerial Photos of 2016 and 2020









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Drainage Services Department
Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix C

Replies from FSD and EPD



消防處

香港九龍尖沙咀東部康莊道1號
消防處總部大廈



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.** : (139) in FSD GR 6-5/4 R Pt. 34
來函檔號 **YOUR REF.** : J2021-03/CS/L011/FSD
電子郵件 **E-mail** : hkfsdenq@hkfsd.gov.hk
圖文傳真 **FAX NO.** : 2739 5879
電 話 **TEL NO.** : 2733 7741

28 June 2021

Lam Environmental Services Limited
19/F, Remex Centre,
42 Wong Chuk Hang Road,
Hong Kong.
(Attn: Mr. Raymond DAI, Contamination Specialist)

Dear Mr. DAI,

**Relocation of Sha Tin Sewage Treatment Works to Caverns –
Site Preparation and Access Tunnel Construction
Supplementary Land Contamination Plan (SCAP)
Request for Information of Dangerous Goods & Incident Records**

I refer to your letters of 17.5.2021 regarding the captioned subject.

According to our record, from the year of 1990 to present moment, dangerous goods licenses have been issued by this department to the subject address, with details as shown in **Appendix A**. No incident record was found at the aforesaid location with your given conditions.

If you have further questions, please feel free to contact the undersigned.

Date	9/7/2021	Scanned	<input type="checkbox"/>	
Job No.	J2021-03			
	Action	Inform	Initial	Remarks
PL				
GL				
SK				
CM				
FW				
RD				
SpK/Ben				

Yours sincerely,

(NG Wing-chit)
for Director of Fire Services



Appendix A

**Relocation of Sha Tin Sewage Treatment Works to Caverns –
Site Preparation and Access Tunnel Construction
Supplementary Land Contamination Plan (SCAP)
Request for Information of Dangerous Goods & Incident Records**

No.	Type of DG	Quantity	Store Location
1.	Cat. 3 Sodium Hydroxide Solution	10,000 Litres	Sha Tin Sewage Treatment Works
2.	Cat. 4 Sodium Hypochlorite Solution	7.85 m ³	Sha Tin Sewage Treatment Works
3.	Cat. 4 Sodium Hypochlorite Solution	7.85 m ³	Sha Tin Sewage Treatment Works

本署檔案
OUR REF: EP 540/P5/1
來函檔案
YOUR REF: J2021-03/CS/L010/EPD
電話
TEL NO: 2158 5841
圖文傳真
FAX NO: 2650 6033
網址
HOME PAGE: <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,
Sha Tin, N.T. Hong Kong.



環境保護署
環保法規管理科
區域辦事處(北)
香港新界沙田
上禾輋路1號
沙田政府合署10樓

31 May 2021

Lam Environmental Services Limited
19/F, Remex Centre,
42 Wong Chuk Hang Road,
Hong Kong

Dear Mr. Dai,

**Relocation of Sha Tin Sewage Treatment Works to Caverns - Site Preparation and
Access Tunnel Construction
Supplementary Land Contamination Plan (SCAP)
Request for Information**

I refer to your letter dated 17 May 2021 on the captioned.

Regarding your enquiries in the above letter, this Regional Office has no record of spillage or leakage of chemicals within the Project sites for the past 5 years. You may like to check with other relevant parties or departments for such information as appropriate.

As registered chemical waste producers within the Project sites are concerned, a register of chemical waste producers is available for inspection in the Territorial Control Office of this department. If you would like to inspect, please contact Mr. Leung Chi-keung, Dennis at 2835 1017 for making appointment to view the records.

Should you have any query on the matter, please contact me at 2158 5841.

Yours sincerely,

(Polly Law)

for Director of Environmental Protection



Lam Environmental Services Limited

Drainage Services Department
Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix D

Questionnaire used during Interview with Site Owner (DSD)

Annex C1

Site Walkover Checklist

GENERAL SITE DETAILS

SITE OWNER/CLIENT Drainage Services Department, HKSAR

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

PERSON CONDUCTING THE QUESTIONNAIRE

NAME Man Cheung (LES)

POSITION Senior Project Engineer

AUTHORIZED OWNER/CLIENT REPRESENTATIVE (IF APPLICABLE)

NAME Pun Siu Wo, David

POSITION Electrical and Mechanical Engineer

TELEPHONE 26841050

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: 120

Part-time: _____

Temporary/Seasonal: _____

Maximum no. of people on site at any time: 80

Typical hours of operation: 24 hrs

Number of shifts: 3

Days per week: 7 Days

Weeks per year: All days throughout the year

Scheduled plant shut-down: N/A

Detail the main sources of energy at the site:

Gas	Yes/ No
Electricity	Yes/ No
Coal	Yes/No
Oil	Yes/ No
Other	Yes/No

SITE DESCRIPTION

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

What is the total site area: 23,560m²

What area of the site is covered by buildings (%): ~20%

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

Hong Kong Drainage Services Department

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

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

If yes, identify those parties: N/A

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

North: Police Station, Hotel and The Chinese University of Hong Kong

South: Hong Kong Jockey Club Stable

East: Shing Mun River

West: Industrial (MTR and Highway)

Annex C1

Site Walkover Checklist

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

Sewage treatment facilities on reclaimed land

State the size and location of the nearest residential communities.

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

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

No

Questionnaire with Existing/Previous Site Owner or Occupier

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

12. Monthly updated: Sodium Hypochlorite Solution x 159boxes; Paint x 21boxes; Chlorine Tablet x 40boxes; Thinner x 50boxes; Rush Reformer x 7bottles; Chemical waste (Spent Acid x 30drums; Spent Alkali x 9drums; Organic Solvent x 23drums)

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

Annex C1

Site Walkover Checklist

Observations

	Yes/No	Notes
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	Yes	Floor of chemical store, chemical waste store, area, collection tank and D.G store was paved with concrete. Bund wall was provided for Chemical tank and cylinder as secondary containment.
2. What are the conditions of the bund walls and floors?	-	The bund wall and concrete floor was observed 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 oil, waste battery, grease, scrap
5. Is there a storage site for the wastes?	Yes	Chemical waste store, area, collection tank and refuse collection point
6. Is there an on-site landfill?	No	
7. Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	
8. Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	
9. Are there any potential off-site sources of contamination?	No	
10. Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	Yes	Switchboards
11. Are there any sumps, effluent pits, interceptors or lagoons on site?	Yes	
12. Any noticeable odours during site walkover?	Yes	Odour from sewage
13. Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Yes	Fuels, lubricating oil, NaOCl



Lam Environmental Services Limited

Drainage Services Department
Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix E

Photo Record of Site Walkover

Dangerous Goods / Chemical Waste Store



Photo 1 – Dangerous Goods / Chemical Waste Store



Photo 2 – The bagged sodium hypochlorite (in powder form) is stored in the DG store room A

Dangerous Goods / Chemical Waste Store



Photo 3 – Paint and paint thinner are stored in the room B.

Chemical Waste Area



Photo 4 – Empty lubrication oil containers, grease containers, bleach drums and waste batteries

Scrap Iron Storage Area



Photo 5 – Temporary metal scrap storage area

Chemical Waste Collecting Tank



Photo 6 – 4000L chemical waste collecting tank

Mechanical Workshop



Photo 7 – Overview of workshop



Photo 8 – Storage area

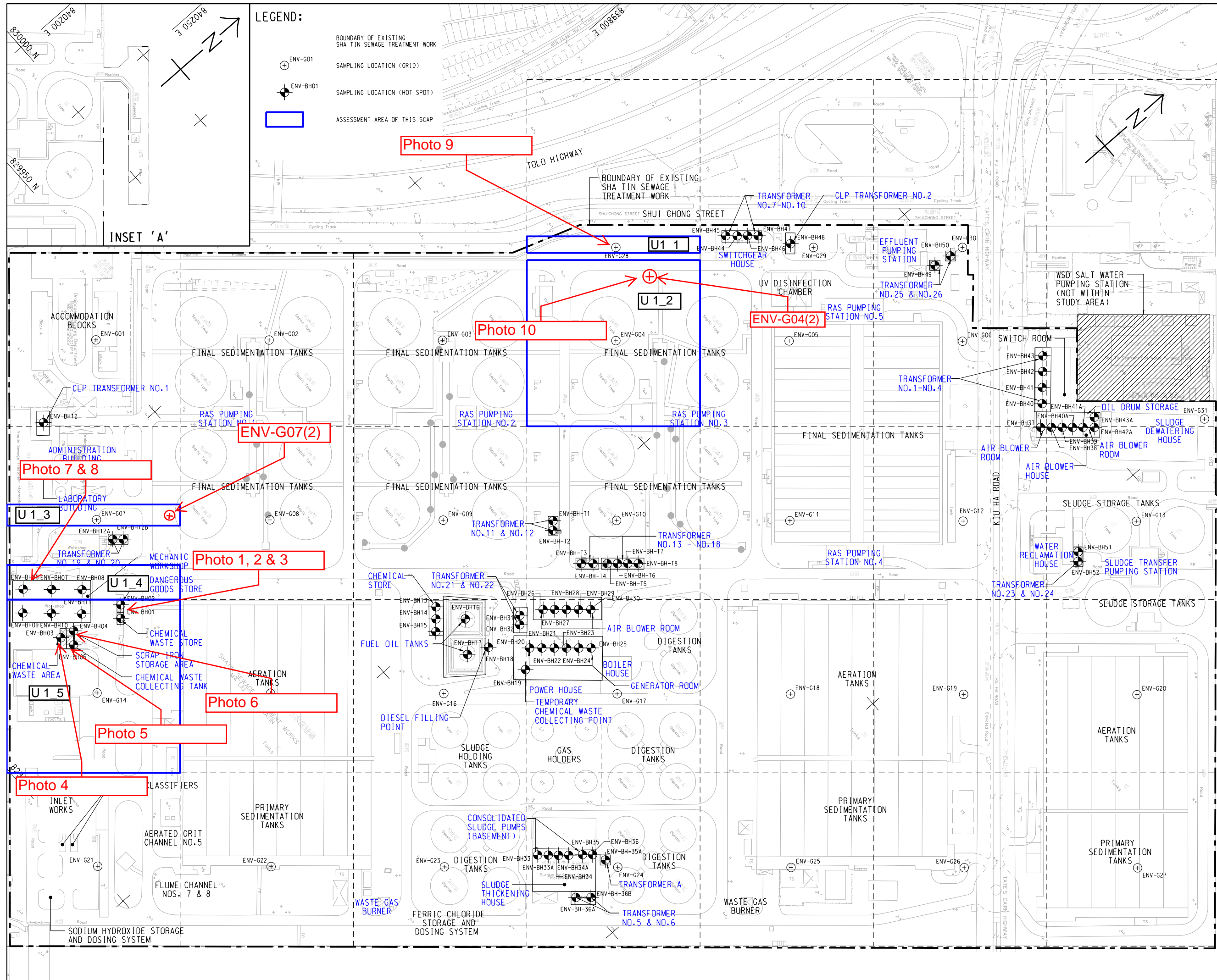
Boundary of Existing STSTW



**Photo 9 –Boundary of Existing STSTW
Final Sediment Tank**



Photo 10 –Final Sediment Tank



- LEGEND:**
- BOUNDARY OF EXISTING SHA TIN SEWAGE TREATMENT WORK
 - ⊕ ENV-G01 SAMPLING LOCATION (GRID)
 - ⊙ ENV-BH01 SAMPLING LOCATION (HOT SPOT)
 - ▭ ASSESSMENT AREA OF THIS SCAP

INSET 'A'

Photo 9

Photo 10

Photo 7 & 8

Photo 1, 2 & 3

Photo 6

Photo 5

Photo 4

ENV-G07(2)

ENV-G04(2)

U1_3

U1_5

U1_1

U1_2

U1_4

TRANSFORMER NO. 21 & NO. 22

TRANSFORMER NO. 13 - NO. 18

TRANSFORMER A

TRANSFORMER NO. 5 & NO. 6

TRANSFORMER NO. 7-NO. 10

CLP TRANSFORMER NO. 2

EFFLUENT PUMPING STATION

TRANSFORMER NO. 25 & NO. 26

RAS PUMPING STATION NO. 5

TRANSFORMER NO. 1-NO. 4

TRANSFORMER NO. 11 & NO. 12

RAS PUMPING STATION NO. 4

TRANSFORMER NO. 23 & NO. 24

CLP TRANSFORMER NO. 1

RAS PUMPING STATION NO. 1

RAS PUMPING STATION NO. 2

RAS PUMPING STATION NO. 3

TRANSFORMER NO. 19 & NO. 20

CHEMICAL WASTE AREA

SCRAP IRON STORAGE AREA

CHEMICAL WASTE COLLECTING TANK

FUEL OIL TANKS

DIESEL FILLING POINT

POWER HOUSE

TEMPORARY CHEMICAL WASTE COLLECTING POINT

GAS HOLDERS

DIGESTION TANKS

CONSOLIDATED SLUDGE PUMPS (BASEMENT)

DIGESTION TANKS

SLUDGE THICKENING HOUSE

DIGESTION TANKS

FERRIC CHLORIDE STORAGE AND DOSING SYSTEM

DIGESTION TANKS

TRANSFORMER NO. 36B

TRANSFORMER NO. 36A

TRANSFORMER NO. 36B

WASTE GAS BURNER

SODIUM HYDROXIDE STORAGE AND DOSING SYSTEM

FLUME CHANNEL NOS. 7 & 8

AERATED GRIT CHANNEL NO. 5

CLASSIFIERS

INLET WORKS

MECHANIC WORKSHOP

LABORATORY BUILDING

ADMINISTRATION BUILDING

ACCOMMODATION BLOCKS

WASTE GAS BURNER

SLUDGE HOLDING TANKS

GENERATOR ROOM

BOILER HOUSE

AIR BLOWER ROOM

DIGESTION TANKS

AIR BLOWER ROOM

GENERATOR ROOM

BOILER HOUSE

AIR BLOWER ROOM

DIGESTION TANKS

AERATION TANKS

PRIMARY SEDIMENTATION TANKS

WASTE GAS BURNER

AERATION TANKS

PRIMARY SEDIMENTATION TANKS

WASTE GAS BURNER

TRANSFORMER NO. 23 & NO. 24

AERATION TANKS

PRIMARY SEDIMENTATION TANKS

WASTE GAS BURNER

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

AIR BLOWER ROOM

WATER RECLAMATION HOUSE

AERATION TANKS

PRIMARY SEDIMENTATION TANKS

WASTE GAS BURNER

SLUDGE DEWATERING HOUSE

SLUDGE TRANSFER PUMPING STATION

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SWITCH ROOM

AIR BLOWER ROOM

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

WSD SALT WATER PUMPING STATION (NOT WITHIN STUDY AREA)

OIL DRUM STORAGE

SLUDGE DEWATERING HOUSE

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS

SLUDGE STORAGE TANKS



Lam Environmental Services Limited

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Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
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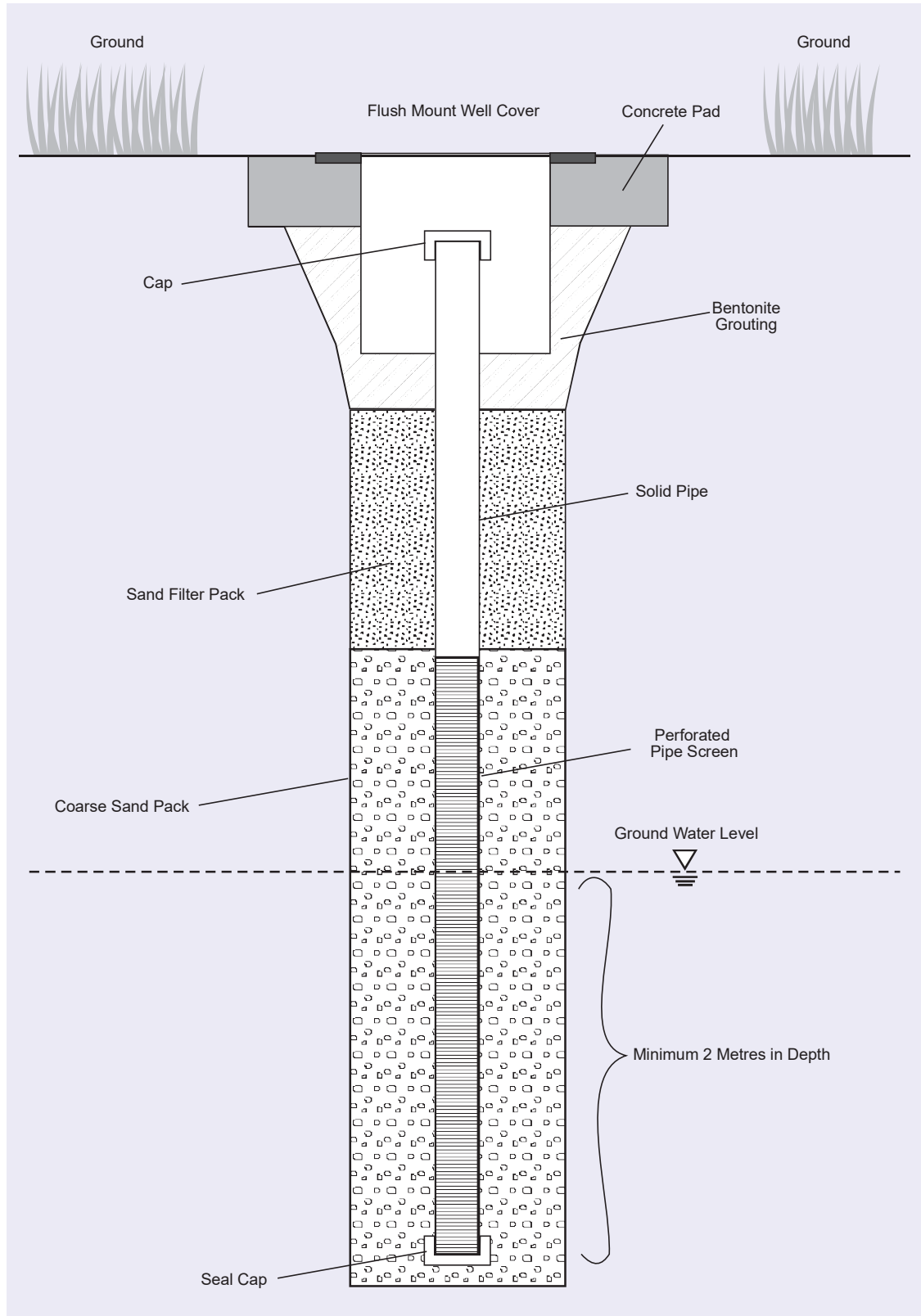
Appendix F

Typical Design of the Groundwater Sampling Well Extracted from Annex E of EPD's Practice Guide

Annex E

Site Investigation Methods

Figure E3
Schematic Drawing of Groundwater Monitoring Well





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Drainage Services Department
Relocation Of Sha Tin Sewage Treatment Works
Supplementary Contamination Assessment Plan for
the Sha Tin Sewage Treatment Works

Appendix G

Tentative Redevelop Site Plan of the Site

