

JOB No.: TCS01196/22



WSD CONTRACT No.: 7/WSD/21 -

CONSTRUCTION OF SIU HO WAN WATER TREATMENT  
WORKS EXTENSION AND SIU HO WAN RAW WATER  
BOOSTER PUMPING STATION

3<sup>rd</sup> QUARTERLY ENVIRONMENTAL MONITORING AND  
AUDIT REPORT – (November 2022 to January 2023)

PREPARED FOR

CHINA ROAD AND BRIDGE CORPORATION

Date	Reference No.	Prepared By Fai So	Certified By Tam Tak Wing
14 February 2023	TCS01196/22/600/R0048v1		
		Assistant Environmental Consultant	Environmental Team Leader

Version	Date	Remarks
1	14 February 2023	First Submission

Our Ref. 1988/23-0006



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**Attn: Mr. SY Kin Lik (SE/CM 3)**

14 February 2023

**By E-mail**

Dear Sir,

**RE: CONTRACT NO. 7/WSD/21  
INDEPENDENT ENVIRONMENTAL CHECKER FOR ENVIRONMENTAL MONITORING AND AUDIT FOR  
SIU HO WAN WATER TREATMENT WORKS EXTENSION  
2<sup>nd</sup> QUARTERLY ENVIRONMENTAL MONITORING AND AUDIT REPORT – (NOVEMBER 2022 TO  
JANUARY 2023)**

I refer to the 3<sup>rd</sup> Quarterly Environmental monitoring and audit report – (November 2022 to January 2023)(Report No.: TCS01196/22/600/R0048v1) received on 14 February 2023 by the Environmental Team (ET), Action-United Environmental Services & Consulting (AUES) via email. In accordance with Condition 4.4 of Environmental Permit No.EP-207/2005/A, I hereby verify the captioned report.

Yours faithfully,

For and on behalf of  
**Allied Environmental Consultants Ltd.**

A handwritten signature in black ink, appearing to be 'Joanne NG', with a small dot at the end.

Joanne NG  
Independent Environmental Checker

*JN/tw*

c.c. Action-United Environmental Services & Consulting (AUES)  
Binnies Hong Kong Limited

Attn: Mr. Ben Tam (By E-mail)  
Attn: Mr. Alex TUNG (By E-mail)

## EXECUTIVE SUMMARY

ES.01. This is the 3<sup>rd</sup> Quarterly EM&A Summary Report presenting monitoring results and inspection finding for the Project for the reporting period from *1 November 2022 to 31 January 2023*.

### ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. Environmental monitoring activities under the EM&A programme for the Contract in the Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Sessions
Air Quality	24-Hour TSP	16
Inspection / Audit	ET Regular Environmental Site Inspection	14
	Joint site audit with Project Consultant and IEC	3

### ACTION AND LIMIT LEVELS EXCEEDANCE

ES.03. In the Reporting Period, no air quality monitoring exceedance was recorded.

### ENVIRONMENTAL COMPLAINT

ES.04. In the Reporting Period, no environmental complaint was received.

### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05. In the Reporting Period, no prosecution or notification of summons was received.

### REPORTING CHANGE

ES.06. No reporting change was recorded in the Reporting Period.

### FUTURE KEY ISSUES

ES.07. For dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to Siu Ho Wan Sewage Treatment Works. The *Contractor* should fully implement the construction dust mitigation measures as appropriately.

ES.08. All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.

ES.09. All other mitigation measures recommended in the Implementation Schedule for Environmental Mitigation Measures of the EM&A Manual should be properly implemented and maintained as far as practicable.

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## 1 INTRODUCTION

### 1.1 PROJECT BACKGROUND

- 1.1.1 Water Supplies Department (WSD) is the Proponent of the Works Contract *7/WSD/21 – Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station* (hereinafter named as the “Works Contract”). The Project works predicted by WSD will be undertaken about 34 months. Layout plan of the Project is shown in *Appendix A*.
- 1.1.2 According to the Environmental Impact Assessment Ordinance (EIAO), the proposed Siu Ho Wan Water Treatment Works Extension is a Designated Project under Schedule 2, which shall be implemented under the Environmental Permit EP-207/2005/A (hereinafter called the “EP”). Besides, the works for Siu Ho Wan Raw Water Booster Pumping Station is a non-designated project which mentioned in Section 1.10 of Environmental Monitoring and Audit (EM&A) Manual.
- 1.1.3 The Works Contract construction activities mainly include:-
- Extension of the existing Siu Ho Wan WTW within the existing Siu Ho Wan WTW compound from a capacity of 150,000 m<sup>3</sup>/day to 300,000 m<sup>3</sup>/day
  - Uprating of the treated/fresh water pumping capacity in the existing Siu Ho Wan Raw Water and Fresh Water Pumping Station within the existing Siu Ho Wan WTW compound from a capacity of 150,000 m<sup>3</sup>/day to 300,000 m<sup>3</sup>/day
  - Construction of the proposed Siu Ho Wan Raw Water Booster Pumping Station and the laying of the associated water mains
- 1.1.4 On 20 March 2022, *China Road and Bridge Corporation* (hereinafter called the “Main Contractor”) awarded the Works Contracts *7/WSD/21*. According to EM&A Manual, only air quality monitoring is required to be conducted which related to the works area under Contracts *7/WSD/21* during construction phase of the SHW WTW Extension. Moreover, site inspection and audit is required under the EM&A program to ensure the recommended environmental mitigation measures are implemented properly and effective.
- 1.1.5 The Main-Contractor appointed Action-United Environmental Services & Consulting (AUES) as the Environmental Team of the Project (hereinafter referred as the “ET”) to implement air quality (baseline and impact) monitoring as well as associated duties in accordance with the EM&A Manual stipulation.
- 1.1.6 Some design changes of the Project have been identified after the EIA stage for betterment in the design development. Some of these changes requires supplementary environmental review to address their likely environmental impacts and to identify any additional mitigation measures required for compliance with the EIAO. Supplementary environmental review has been performed for the changes and the review results are presented in the “Review Report on Environmental Impact Assessment (Review Report on EIA)” prepared under “Agreement No. CE 82/2017 (WS)”. Having reviewed the Review Report on EIA, no changes to the environmental monitoring requirement in the EM&A Manual are proposed for the work of SHW WTW Extension.
- 1.1.7 According to the approved EM&A Manual, only air quality is required to be monitored during the construction phase of the Project. As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Pursuant to the EM&A Manual, baseline environmental monitoring is required to be conducted prior to commencement of the construction works under the Project. Baseline air quality monitoring was conducted from *8 to 21 April 2022*. During the baseline monitoring period, no major construction activities under the Project was observed.
- 1.1.8 This is the *3<sup>rd</sup>* Quarterly EM&A Report presenting monitoring results and inspection finding for the Project for the reporting period from *1 November 2022 to 31 January 2023*.

## 1.2 REPORT STRUCTURE

1.2.1 The Quarterly EM&A Report is structured into the following sections:-

*Section 1 Introduction*

*Section 2 Project Organization and Construction Progress*

*Section 3 Summary of Impact Monitoring Requirements*

*Section 4 Air Quality Monitoring*

*Section 5 Waste Management*

*Section 6 Site Inspections*

*Section 7 Environmental Complaints and Non-Compliances*

*Section 8 Implementation Status of Mitigation Measures*

*Section 9 Conclusions and Recommendations*

## 2 PROJECT ORGANISATION AND CONSTRUCTION PROGRESS

### 2.1 PROJECT ORGANISATION

2.1.1 The project organization is shown in *Appendix B*. The roles and responsibilities of the various parties involved in the EM&A process and the organizational structure of the organizations responsible for implementing the EM&A programme are outlined below.

#### Water Supplies Department (WSD)

2.1.2 WSD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by WSD to audit the results of the EM&A works carried out by the ET.

#### Environmental Protection Department (EPD)

2.1.3 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

#### Project Manager's Delegate (PMD)

2.1.4 The *PMD* is responsible for overseeing the construction works and for ensuring that the works are undertaken by the *Contractor* in accordance with the specification and contract requirements. The duties and responsibilities of the *PMD* with respect to EM&A are:

- Supervise the *Contractor's* activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the *Contractor* when action is required to reduce impacts in accordance with the Event and Action Plans;
- Comply with the agreed Event Contingency Plan in the event of any exceedance.

#### The Contractor

2.1.5 The Main *Contractor* is responsible perform construction works and for ensuring that the works are undertaken compliance with the specification and contract requirements. The duties and responsibilities of the Main *Contractor* with respect to EM&A are:

- Employ an ET to undertake monitoring, laboratory analysis and reporting of environmental monitoring and audit;
- Provide information / advice to the ET regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact whenever Action and Limit levels are exceeded;
- Implement the corrective actions instructed by the *PMD*;
- Accompany joint site audit undertaken by the ET; and
- Adhere to the procedures for carrying out complaint investigation.

#### Environmental Team (ET)

2.1.6 The ET is responsible perform implementation EM&A programmes of the Contract Works as stipulated in the Updated EM&A Manual ensure the works are fully compliance with environmental regulations. The duties and responsibilities of the ET with respect to EM&A are:

- Set up all the required environmental monitoring stations;
- Monitor various environmental parameters as required in the EM&A Manual;
- Analyze the EM&A data and review the success of EM&A programme to cost effectively confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the *Contractors'* site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental



conditions;

- Report on the EM&A results to the IEC, *Contractor*, the *PMD* and EPD or its delegated representative;
- Recommend suitable mitigation measures to the *Contractor* in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans;
- Undertake regular and ad-hoc on-site audits / inspections and report to the *Contractor* and the *PMD* of any potential non-compliance; and
- Follow up and close out non-compliance actions.

Independent Environmental Checker (IEC)

2.1.7 The duties and responsibilities of IEC with respect to EM&A are:

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Report the audit results to the *PMD* and EPD in parallel;
- Review the EM&A reports (monthly summary reports) submitted by the ET;
- Review the proposal on mitigation measures submitted by the *Contractor* in accordance with the Event and Action Plans;
- Check the mitigation measures submitted by the *Contractor* in accordance with the Event and Action Plans;
- Check the mitigation measures that have been recommended in the EIA and this Manual, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to *PMD* and EPD;
- Coordinate the monitoring and auditing works for all the on-going contracts in the area in order to identify possible sources / causes of exceedances and recommend suitable remedial actions where appropriate; and
- Coordinate the assessment and response to complaints / enquires from locals, green groups, district councils or the public at large.

## 2.2 CONSTRUCTION PROGRESS

2.2.1 The major construction activities conducted under the Contract in the Reporting Period are listed below.

November 2022

- Installation of ELS and excavation at WTB and OLB
- Construction of car park barrack at DfMA Yard
- Excavation works for installation of ELS at BPS
- Diversion of OSCG trough
- Construction of chain link fence at DfMA Area
- Erection of Tower Crane at existing barrack

December 2022

- Pre-boring Works in Progress at WTB
- Backfilling Works in Progress for BPS Foundation
- Construction of Temporary CLP Transformer Room
- Cable Trough Excavation for Tower Crane
- Transplanted Tress in Compensatory Tree Area
- Refurbishment of Show Room at the Entrance of *PMD*'s MiC Office

January 2023

- Submission of BIM execution plan
- DfMA schematic design was submitted

- Concreting of blinding layer are in progress at portion BPS-1.
- Backfill of subbase for the foundation of Booster Pumping Station at portion BPS-1.
- Excavation and backfilling of cable trough at portion WTW-9.
- Pre-boring for piling of king posts at portion WTW-1.
- Plant trial for submitted concrete mix is in progress.
- Diversion of four numbers of DN50 Pipe watermain at portion WTW-2 is in progress.
- Diversion of uncharted copper water pipe at portion WTW-2.
- Maintenance for transplanted trees T259 and T3350 is in progress.
- Cable laying at portion WTW-7 along existing Administration Building.
- Construction of chain link fence was completed at DfMA Yard.
- Detailed site survey of existing E & M facilities, cable trenches / draw pits and pipe trenches.

## 2.3 SUMMARY OF ENVIRONMENTAL PERMITS AND LICENCES

2.3.1 Summary of the relevant permits, licences, and/or notifications on environmental protection for the Project are presented in **Table 2-1**.

**Table 2-1 Status of Environmental Licences and Permits of the Contract**

Item	Description	Licence/Permit Status			
		Reference No./ License No./ Account No.	Approval Date	Expiry Date	Status
1	Air Pollution Control (Construction Dust) Regulation	Ref: 477913	23 Mar 2022	N/A	Valid
2	Waste Disposal Regulation – Billing Account for Disposal of Construction Waste	EPD Ref. No: RS02509 Acc. No.: 7043631	08 Apr 2022	N/A	Valid
3	Chemical Waste Producer Registration	5213-961-C4701-01	31 May 2022	N/A	Valid
4	Water Pollution Control Ordinance – Discharge Licence	WT00041885-2022	8 Sep 2022	30 Sep 2027	Valid
5	Construction Noise Permit	GW-RS0761-22	9 Sep 2022	18 Mar 2023	Valid

### 3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

#### 3.1 GENERAL

- 3.1.1 Only air quality monitoring is required to carry out related to Works contracts *7/WSD/21* during the construction phase to ensure the dust mitigation measures and performance properly implementation.
- 3.1.2 The other environmental monitoring for Works Area of Pui O was related to other Works Contracts and will be implemented by other appointed ET.
- 3.1.3 According to the Review Report on EIA, no changes to the environmental monitoring requirement in the EM&A Manual are proposed for the work of SHW WTW Extension. Air quality monitoring work will be implemented according to the EM&A Manual.

#### 3.2 MONITORING PARAMETERS

- 3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:
- Air quality;
- 3.2.2 A summary of impact monitoring parameters is presented in *Table 3-1*:

**Table 3-1 Summary of Monitoring Parameters**

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> <li>• 1-hour TSP by Real-Time Portable Dust Meter(as required in case of complaints); and</li> <li>• 24-hour TSP by High Volume Air Sampler.</li> </ul>

#### 3.3 MONITORING LOCATIONS

- 3.3.1 According to the Review Report on EIA, air quality monitoring work should be implemented according to the EM&A Manual. As stated in Section 4 of EM&A Manual, there was only one air quality monitoring station designated under SHW WTW Extension. The air quality monitoring locations is listed in *Table 3-2*.

**Table 3-2 Designated Air Quality Monitoring Stations**

Monitoring Station Identification No	Location
SHWAB	Siu Ho Wan WTW Administration Building

#### 3.4 MONITORING FREQUENCY AND PERIOD

- 3.4.1 The requirements of impact monitoring are stipulated in *Sections 2.1.9* of the approved EM&A Manual and presented as follows.

##### Air Quality Monitoring

- 3.4.2 Frequency of impact air quality monitoring is as follows:
- 1-hour TSP                      3 times every six days (as required in case of complaints)
  - 24-hour TSP                      Once every 6 days during course of works.

#### 3.5 MONITORING EQUIPMENT

##### Air Quality Monitoring

- 3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it

shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring are listed in below table.

**Table 3-3 Air Quality Monitoring Equipment**

Equipment	Model
<b><i>24-Hr TSP</i></b>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<b><i>1-Hour TSP</i></b>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter / SidePak™ Personal Aerosol Monitor AM510

### 3.6 MONITORING PROCEDURES

#### **1-hour TSP**

3.6.1 Operation of the 1-hour TSP meter will follow manufacturer's Operation and Service Manual.

3.6.2 The 1-hour TSP monitor, brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 900 light scattering. The 1-hour TSP monitor consists of the following:

- a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.3 The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Span check and BG of the instrument will be performed before each monitoring event.

#### **24-hour TSP**

3.6.4 The equipment used for 24-hour TSP measurement is the High Volume Sampler (hereinafter the "HVS") brand named TISCH, Model TE-5170 TSP High Volume Air Sampler, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The HVS consists of the following:

- a. An anodized aluminum shelter;
- b. A 8"x10" stainless steel filter holder;
- c. A blower motor assembly;
- d. A continuous flow/pressure recorder;
- e. A motor speed-voltage control/elapsed time indicator;
- f. A 7-day mechanical timer, and
- g. A power supply of 220v/50 Hz

3.6.5 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground or the roof of building. The flow rate of the HVS between 0.6m<sup>3</sup>/min and 1.7m<sup>3</sup>/min will be properly set in accordance with the manufacturer's instruction to within the range recommended in *EPA Code of Federal Regulation, Appendix B to Part 50*. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-Hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-

- A horizontal platform with appropriate support to secure the samples against gusty wind should

- be provided;
  - Installed with elapsed-time meter with  $\pm 2$  minutes accuracy for 24 hours operation;
  - Equipped with a timing/control device with  $\pm 5$  minutes accuracy for 24 hours operation;
  - With flow control accuracy for  $\pm 2.5\%$  deviation over 24-hour sampling period;
  - No two samplers should be placed less than 2 meters apart;
  - The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
  - A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
  - Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
  - The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
  - The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
  - After sampling, the filter paper will be collected and transfer from the filter holder of the HVS to a sealed envelope and sent to a local HOKLAS accredited laboratory for quantifying.
- 3.6.6 All the sampled 24-hour TSP filters will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.
- 3.6.7 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in m<sup>3</sup>/min. Motor brushes of HVS will be regularly replaced of about five hundred hours per time.
- 3.6.8 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are presented in the relevant monthly EM&A reports.

### 3.7 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

- 3.7.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual, the air quality criteria were set up, namely Action and Limit levels are listed in *Tables 3-4*.

**Table 3-4 Action and Limit Levels of Air Quality**

Monitoring Station	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
SHWAB	291	170	500	260

### 3.8 METEOROLOGICAL INFORMATION

- 3.8.1 The meteorological information including wind direction, wind speed, humidity, rainfall, air pressure and temperature is extracted from the Chek Lap Kok Station. Meteorological data are attached in *Appendix F*.

### 3.9 DATA MANAGEMENT AND DATA QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

- 3.9.1 All monitoring data were handled by the ET's in-house data recording and management system.

- 3.9.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at each monitoring day or after completion of baseline measurement. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.
- 3.9.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

## 4 AIR QUALITY MONITORING

### 4.1 GENERAL

4.1.1 In the reporting Period, no air quality complaint was received, thus no 1-hour TSP monitoring required to conduct according to **Section 2.19** of the approved EM&A Manual.

### 4.2 SUMMARY OF MONITORING RESULTS

4.2.1 Summary of air quality monitoring results during the Reporting Period are tabulated in **Table 4-1**. The relevant graphical plots throughout the Reporting Period are presented in **Appendix E**.

**Table 4-1 Summary of 24-hour TSP Monitoring Result – SHWAB**

Monitoring Location	24-hour TSP ( $\mu\text{g}/\text{m}^3$ )		
	Max	Min	Mean
SHWAB	105	38	73
Record Date	30-Dec-2022	28-Nov-2022	16 events

4.2.2 Breaches of air quality A/L levels and statistical analysis of compliance for the air quality monitoring results are summarized in **Table 4-2**.

**Table 4-2 Summaries of Breaches of Air Quality A/L Levels**

Location	Exceedance	24- hour TSP	Total
SHWAB	Action Level	0	0
	Limit Level	0	0

4.2.3 The meteorological data during the impact monitoring days are summarized in **Appendix F**.

## 5 WASTE MANAGEMENT

### 5.1 GENERAL WASTE MANAGEMENT

5.1.1 Waste management was carried out in accordance with the Waste Management Section in Environmental Management Plan for the Contract.

### 5.2 RECORDS OF WASTE QUANTITIES

5.2.1 All types of waste arising from the construction works are broadly classified into the following:

- Inert construction and demolition (C&D) material; and
- C&D waste.

5.2.2 The quantities of waste for disposal in this Reporting Period under the Contract are summarised in **Tables 5-1** and **5-2** and the Waste Flow Table as shown in **Appendix G**. Whenever possible, materials were reused on-site as far as practicable.

**Table 5-1 Summary of Quantities of Inert C&D Materials for the Contract**

Type of Waste	Quantity				Disposal Location
	Nov 22	Dec 22	Jan 23	Total	
Reused in this Contract (Inert) (in T)	0	0	0	0	NA
Reused in other Contracts/ Projects (Inert) (in T)	0	0	0	0	NA
Disposal as Public Fill (Inert) (in T)	6598.800	4728.820	2039.930	13367.55	TM 38

**Table 5-2 Summary of Quantities of C&D Wastes for the Contract**

Type of Waste	Quantity in Reporting Month				Disposal Location
	Nov 22	Dec 22	Jan 23	Total	
Recycled Metal ('000kg)	0	0	0	0	Licensed Collector
Recycled Paper / Cardboard Packing ('000kg)	0	0.518	0	0.518	NA
Recycled Plastic ('000kg)	0	0	0	0	NA
Chemical Wastes ('000kg)	0	0	0	0	NA
General Refuses (in T)	37.250	9.08	5.100	51.430	NENT



## 6 SITE INSPECTIONS

### 6.1 REQUIREMENTS

- 6.1.1 According to the EM&A Manual, the programme of environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections were carried out to confirm the environmental performance.
- 6.1.2 During the Reporting Period, **14** events of the joint site inspections were undertaken for The Contract to evaluate the site environmental performance. The summaries of the findings during site inspection are presented in **Table 6-1** and the details of site inspection can be found in relevant EM&A monthly report.

**Table 6-1 Summary of Reminders/Observations of Site Inspection**

Reporting Period	Date of site inspection	Nos. of findings / reminders	Follow-Up Status
November 2022	1, 8, 15, 22 and 29 November 2022	7	Completed.
December 2022	6, 13, 21 and 28 December 2022	4	Completed.
January 2023	3, 9, 17, 27 and 31 January 2023	7	Completed.

- 6.1.3 In the Reporting Period, no non-compliance was recorded for The Contract; however, **18** observations/Reminders were recorded during the site inspections. Details of the findings of the inspection in the reporting period can be referred to the Monthly EM&A Report. The findings found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

## 7 ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCES

### 7.1 ENVIRONMENTAL COMPLAINTS, SUMMONS AND PROSECUTIONS

7.1.1 In the Reporting Period, no environmental complaint was recorded.

7.1.2 No summons and prosecution under the EM&A Programme was lodged for all Contracts.

7.1.3 The statistical summary table of environmental complaint, summons and prosecution are presented in *Tables 7-1, 7-2 and 7-3* and the updated complaint log is shown in *Appendix H*.

**Table 7-1 Statistical Summary of Environmental Complaints**

Reporting Month	Environmental Complaint Statistics			
	Frequency	Cumulative since commencement of project	Complaint Nature	Project related complaint
November 2022	0	0	NA.	NA.
December 2022	0	0	NA.	NA.
January 2023	0	0	NA.	NA.

**Table 7-2 Statistical Summary of Environmental Summons**

Reporting Month	Environmental Summons Statistics		
	Frequency	Cumulative	Project related summons
November 2022	0	0	NA.
December 2022	0	0	NA.
January 2023	0	0	NA.

**Table 7-3 Statistical Summary of Environmental Prosecution**

Reporting Month	Environmental Prosecution Statistics		
	Frequency	Cumulative	Project related prosecution
November 2022	0	0	NA.
December 2022	0	0	NA.
January 2023	0	0	NA.

## 8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

### 8.1 GENERAL REQUIREMENTS

- 8.1.1 The environmental mitigation measures recommended in the ISEMM in the EM&A Manual covered the issues of dust, noise, water, waste, land contamination and ecology and they are summarised and presented in *Appendix I*.
- 8.1.2 The Contract works under the Project shall be implementing the required environmental mitigation measures according to the EM&A Manual as subject to the site conditions. Environmental mitigation measures generally implemented by the Contract and the implementation status are shown in *Appendix I*.

## 9 CONCLUSIONS AND RECOMMENDATIONS

### 9.1 CONCLUSIONS

- 9.1.1 As advised by the *Contractor*, the major construction works under Works Contract was commenced on 24 May 2022. This is the 3<sup>rd</sup> Quarterly EM&A Summary Report presenting the monitoring results and inspection findings for the Reporting Period from *1 November 2022 to 31 January 2023*.
- 9.1.2 For air quality monitoring, no 24-hour TSP monitoring results triggered the Action /Limit Level.
- 9.1.3 No environmental compliant, summons or successful prosecutions were recorded in the Reporting Period.
- 9.1.4 During the Reporting Period, weekly joint site inspection by the *PMD*, *IEC*, *ET* and The *Contractor* were carried out in accordance with the EM&A Manual stipulation. No non-compliance observed during the site inspection.

### 9.2 RECOMMENDATIONS

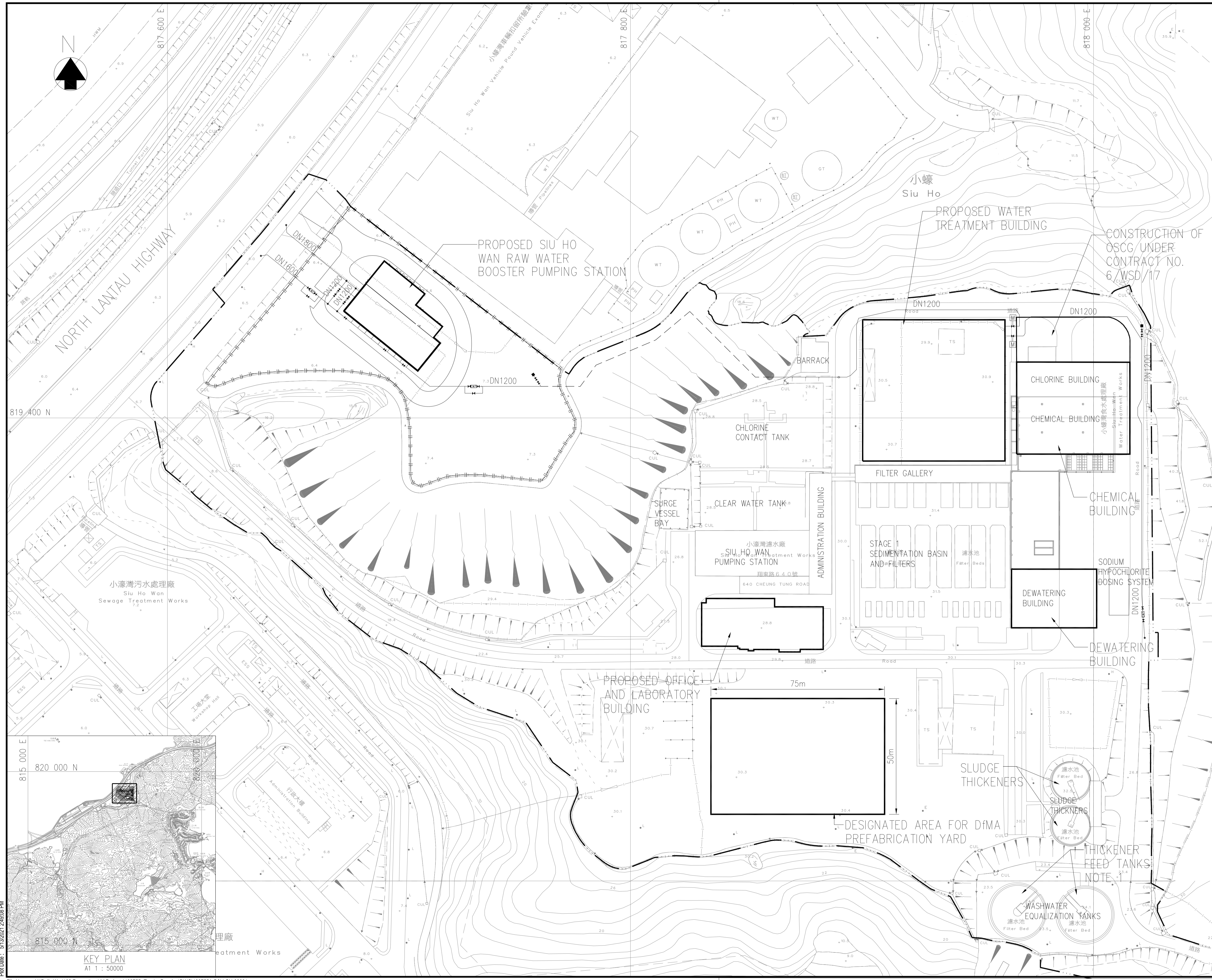
- 9.2.1 For dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to Siu Ho Wan Sewage Treatment Works. The *Contractor* should fully implement the construction dust mitigation measures as appropriately.
- 9.2.2 All effluent discharge shall fulfill the requirement of Discharge Licence under the Water Pollution Control Ordinance.
- 9.2.3 All other mitigation measures recommended in the Implementation Schedule for Environmental Mitigation Measures of the EM&A Manual should be properly implemented and maintained as far as practicable.

## **Appendix A**

### **Layout Plan of the Project**

- LEGEND:**
- SITE BOUNDARY
  - - - PROPOSED RAW WATER MAINS (BURIED)
  - - - PROPOSED RAW WATER MAINS (EXPOSED)
  - |-|-| PROPOSED FENCING
  - ▭ PROPOSED BUILDING WORKS

**NOTE 1:**  
THE EXISTING WASHWATER EQUALIZATION TANKS TO BE RENAMED AS THICKENER FEED TANKS



CONSTRUCTION OF OSCG UNDER CONTRACT NO. 6/WSD/17

Revision	Date	Description	Initial
0	05/21	ISSUE FOR TENDER DRAWING	JC
		Designed	Checked
Initial		CT/CCK	YFC/AS
Date	05/21	05/21	05/21

Approved  
*James Chan*

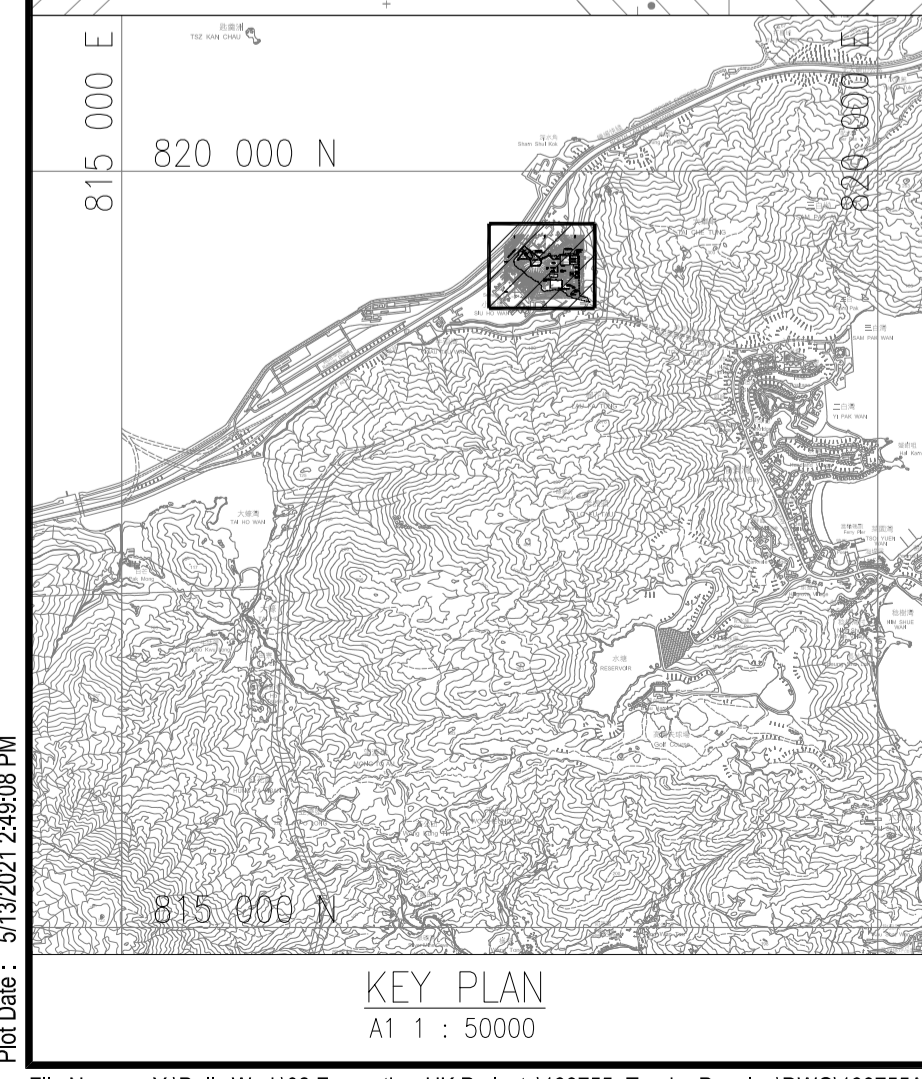
Contract No. 7/WSD/21

Contract Title  
CONSTRUCTION OF SIU HO WAN WATER TREATMENT WORKS EXTENSION AND SIU HO WAN RAW WATER BOOSTER PUMPING STATION

Drawing Title  
SITE LOCATION

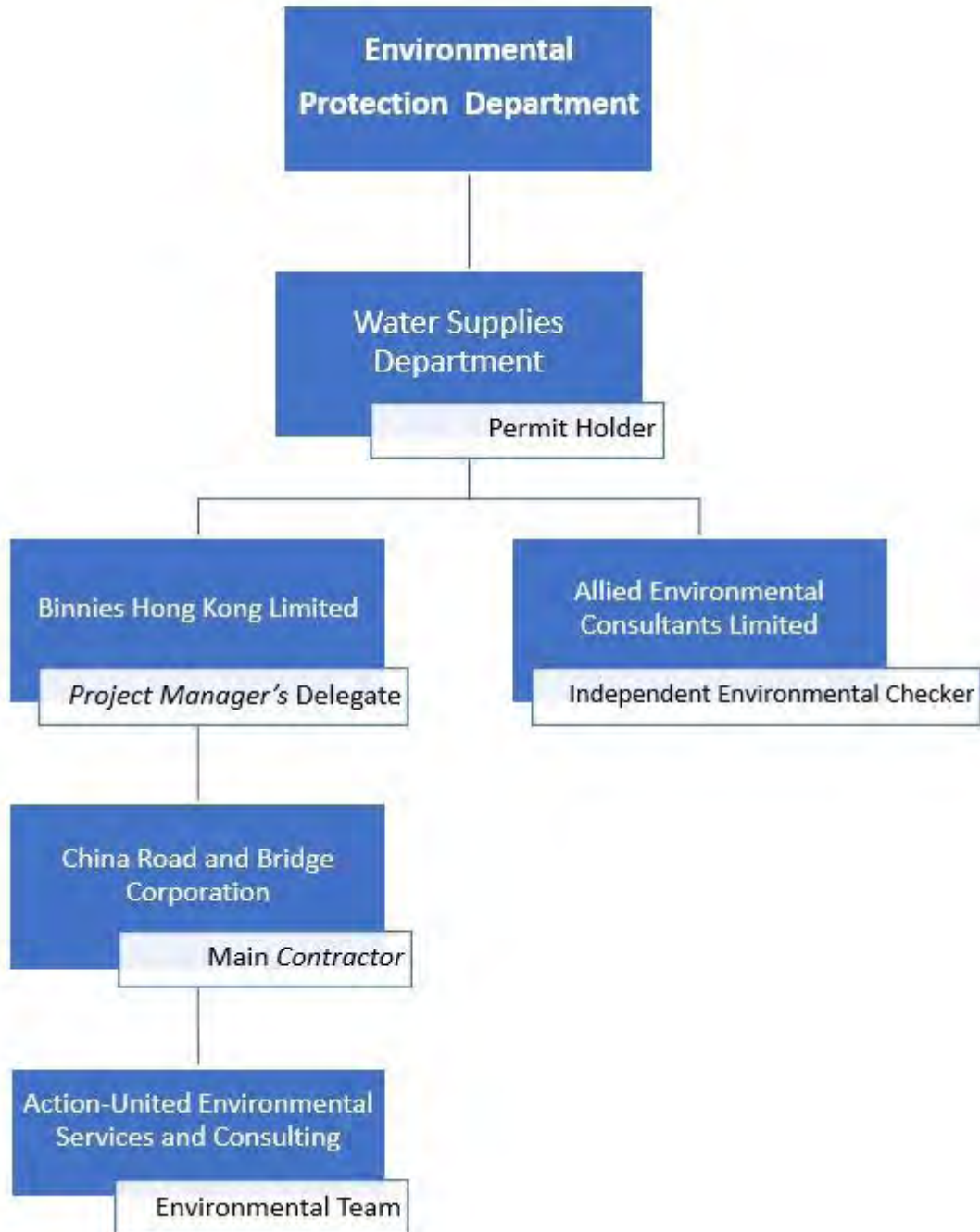
Drawing No. 199755A/B&V/GN/00001	Revision 0
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Scale A1 1 : 750  
A3 1 : 1500



## **Appendix B**

### **Project Organisation**





Contact Details of Key Personnel

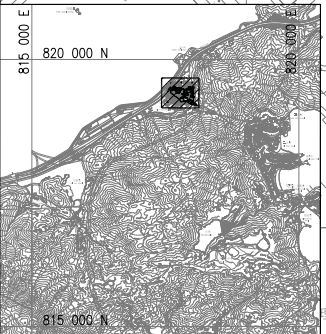
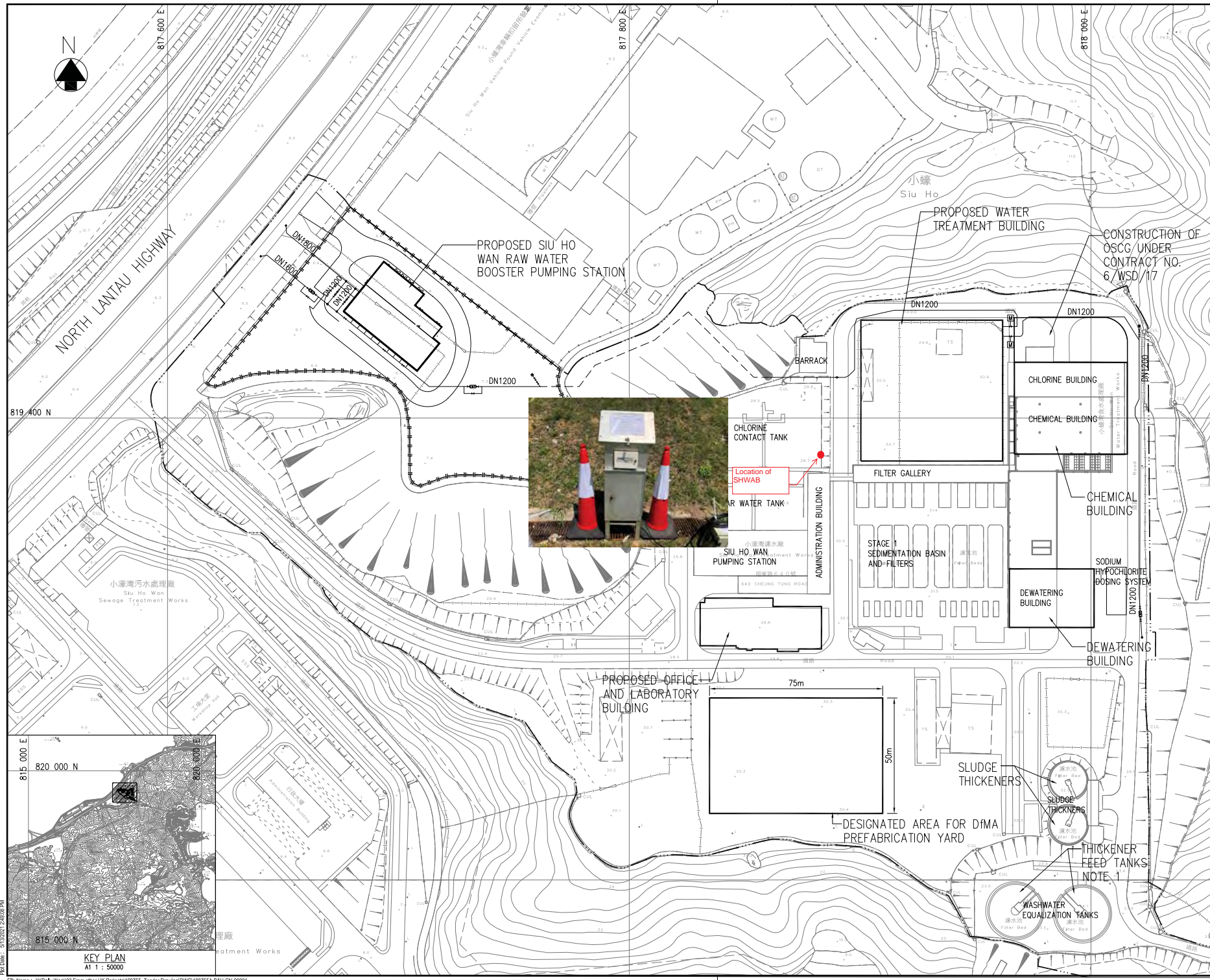
Organisation	Project Role	Position	Name	Tel No.
Binnies Hong Kong Limited	<i>Project Manager's Delegate</i>	Chief Resident Engineer	Mr. Gilbert Ying	6343 1027
		Senior Resident Engineer	Mr. Alex Tung	9080 0079
		Resident Engineer	Ms. Jenny Ng	9267 8638
		Assistant Resident Engineer	Mr. Warren Yeung	6343 1010
China Road and Bridge Corporation	<i>Contractor</i>	Site Agent	Mr. Raymond Mau	5335 9571
		Works Manager	Mr. Chan Ming Tai	9358 7007
		Environmental Officer	Ms. Wendy Leung	9877 4750
		Environmental Supervisor	Mr. Patrick Wan	9618 0010
Allied Environmental Consultants Limited	Independent Environmental Checker	Principle Consultant	Ms. Joanne Ng	2815 7028
Action-United Environmental Services Consulting and	Environmental Team	Environmental Team Leader	Mr. Tam Tak Wing	2959 6059
		Environmental Consultant	Ms. Nicola Hon	2959 6059
		Environmental Consultant	Mr. Ben Tam	2959 6059

## Appendix C

### Monitoring Locations

**LEGEND:**  
 - - - - - SITE BOUNDARY  
 - - - - - PROPOSED RAW WATER MAINS (BURIED)  
 - - - - - PROPOSED RAW WATER MAINS (EXPOSED)  
 - - - - - PROPOSED FENCING  
 □ PROPOSED BUILDING WORKS

**NOTE:**  
 THE EXISTING WASHWATER EQUALIZATION TANKS TO BE RENAMED AS "THICKENER FEED TANKS"



Revision	Date	Description	Drawn	Checked	Initial
0	05/21	ISSUE FOR TENDER DRAWING	JC		
Initial		Designed	YFC/AS	Drawn	Checked
Date	05/21	05/21	SZ	05/21	JC

Approved

Contract No. 7/WSD/21

Contract Title  
 CONSTRUCTION OF SIU HO WAN WATER TREATMENT WORKS EXTENSION AND SIU HO WAN RAW WATER BOOSTER PUMPING STATION

Drawing Title  
 SITE LOCATION

Drawing No. 199755A/B&V/GN/00001  
 Revision 0

Scale A1 : 1 : 750  
 A3 : 1 : 1500

水務署  
 Water Supplies Department

**binnie**  
 BINNIES HONG KONG LIMITED  
 寶尼新工程顧問有限公司

## **Appendix D**

### **Event and Action Plan**

### Event Action Plan for Air Quality

Event	Action			
	ET	IEC	PMD	Contractor
Action Level exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform IEC, <i>PMD</i> and <i>Contractor</i>;</li> <li>3. Repeat measurement to confirm finding; and</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check <i>Contractor</i>'s working method; and</li> <li>3. Review and advise the ET and <i>PMD</i> on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify <i>Contractor</i>.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Rectify any unacceptable practice and implement remedial measures; and</li> <li>3. Amend working methods agreed with <i>PMD</i> if appropriate.</li> </ol>
Action Level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform IEC, <i>PMD</i> and <i>Contractor</i>;</li> <li>3. Advise the <i>PMD</i> and <i>Contractor</i> on the effectiveness of the proposed remedial measures;</li> <li>4. Repeat measurements to confirm findings;</li> <li>5. Increase monitoring frequency to daily;</li> <li>6. Discuss with IEC, <i>PMD</i> and <i>Contractor</i> on remedial actions required;</li> <li>7. If exceedance continues, arrange meeting with IEC and <i>PMD</i>; and</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check <i>Contractor</i>'s working method;</li> <li>3. Discuss with ET and <i>Contractor</i> on possible remedial measures;</li> <li>4. Advise the ET and <i>PMD</i> on the effectiveness of the proposed remedial measures; and</li> <li>5. Supervise Implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify <i>Contractor</i>; and</li> <li>3. Supervise and ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Submit proposals for remedial actions to <i>PMD</i> with a copy to ET and IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals; and</li> <li>4. Amend proposal if appropriate.</li> </ol>
Limit Level exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform <i>PMD</i>, <i>Contractor</i>, IEC and EPD;</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check <i>Contractor</i>'s working method;</li> <li>3. Discuss with ET, <i>PMD</i> and <i>Contractor</i> on possible remedial</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify <i>Contractor</i>; and</li> <li>3. Supervise and ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Take immediate action to avoid further exceedance;</li> </ol>

	<ol style="list-style-type: none"> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Assess effectiveness of remedial actions and keep IEC, EPD and PMD informed of the results.</li> </ol>	<ol style="list-style-type: none"> <li>4. Advise the PMD and ET on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise implementation of remedial measures.</li> </ol>		<ol style="list-style-type: none"> <li>3. Submit proposals for remedial actions to PMD with a copy to ET and IEC within 3 working days of notification;</li> <li>4. Implement the agreed proposals; and</li> <li>5. Amend proposal if appropriate.</li> </ol>
Limit Level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Notify IEC, PMD, Contractor and EPD;</li> <li>2. Identify source;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Arrange meeting with IEC, Contractor and PMD to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and PMD informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss amongst PMD, ET, and Contractor on the potential remedial actions;</li> <li>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the PMD accordingly; and</li> <li>5. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise and ensure remedial measures properly implemented; and</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Submit proposals for remedial actions to PMD with a copy to ET and IEC within 3 working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Resubmit proposals if problem still not under control;</li> <li>6. Stop the relevant portion of works as determined by the PMD until the exceedance is abated.</li> </ol>

Note:

ET – Environmental Team

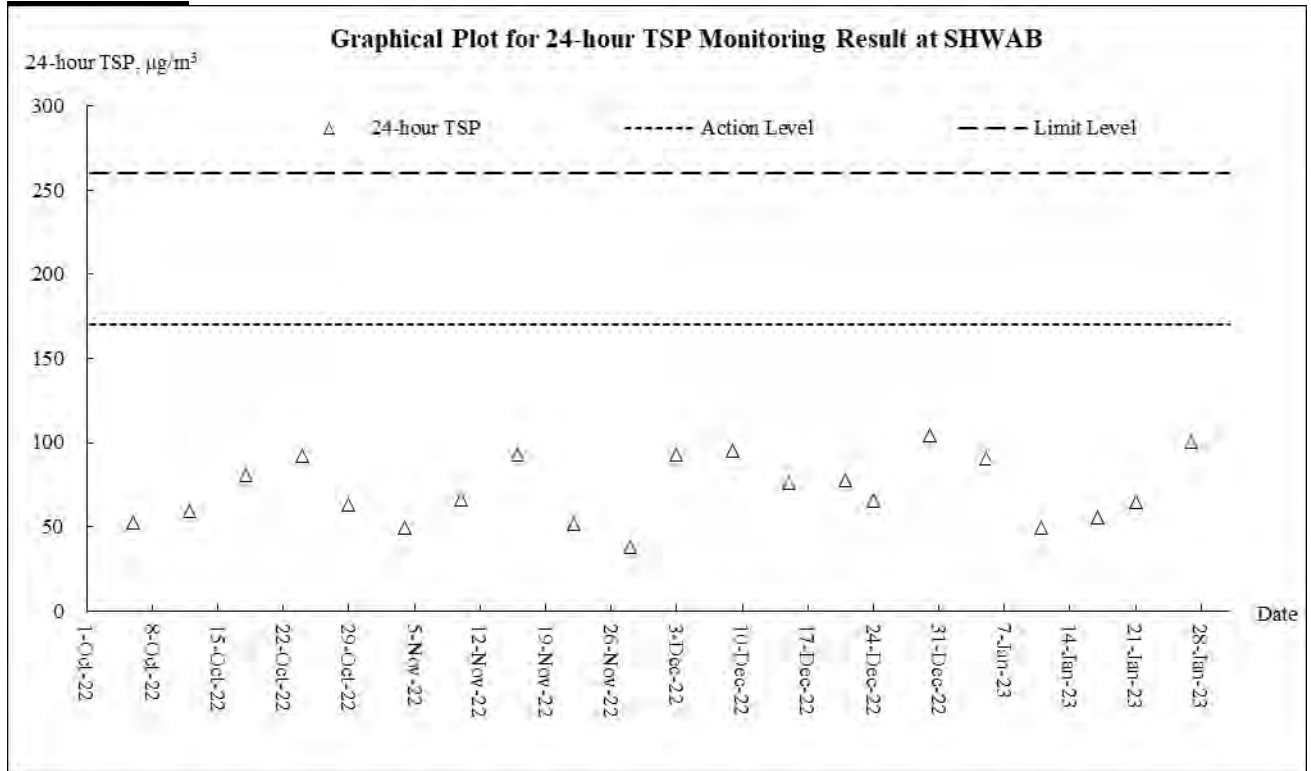
IEC – Independent Environmental Checker

PMD – Project Manager's Delegate

## Appendix E

### Graphical Plots for Monitoring Result

**24-Hour TSP**





## Appendix F

### Meteorological Data

## Weather Condition Extracted from HKO

### The weather of November 2022

With the northeast monsoon over southern China generally weaker than normal for most of the time in the month, November 2022 was much warmer than usual in Hong Kong. The mean minimum temperature of 22.0 degrees and mean temperature of 23.4 degrees were 1.7 degrees and 1.2 degrees above the respective normals and were respectively the second and the third highest for November on record. Together with the exceptionally hot weather in September 2022, Hong Kong experienced the warmest autumn on record from September to November 2022. The mean maximum temperature of 29.2 degrees and the mean temperature of 26.4 degrees for September to November 2022 were both the highest on record for the same period. Moreover, the mean minimum temperature of 24.4 degrees was also one of the highest on record for the same period. Attributing to the rainfall associated with tropical cyclone Nalgae in early November, the month was also much wetter than usual. The monthly total rainfall was 130.8 millimetres, more than three times of the normal figure of 39.3 millimetres. The accumulated rainfall up to November this year was 2179.7 millimetres, a deficit of around 9 percent compared with the normal of 2402.4 millimetres for the same period. The month was also unseasonably gloomy with only 100.3 hours of bright sunshine, about 42 percent below the normal figure of 172.3 hours and the lowest for November on record.

### The weather of December 2022

With stronger than normal northeast monsoon affecting southern China in the month, the weather of Hong Kong was colder than usual in December 2022. The monthly mean temperature was 16.6 degrees, 1.6 degrees below the normal figure of 18.2 degrees. The monthly total rainfall was 25.7 millimetres, about 11 percent below the normal figure of 28.8 millimetres. The annual total rainfall of 2205.4 millimetres in 2022 was about 9 percent below the annual normal of 2431.2 millimetres.

### The weather of January 2023

With the northeast monsoon over Guangdong generally weaker than normal for most of the time in the month, despite a few cold interludes, January 2023 was overall warmer than usual in Hong Kong. The monthly mean temperature was 17.0 degrees, 0.5 degrees above the normal of 16.5 degrees. The month was also drier than usual. The monthly total rainfall was 18.2 millimetres, about 45 percent below the normal figure of 33.2 millimetres.

*Remark: The meteorological data during the Reporting Period is presented in the relevant monthly EM&A report.*

## Appendix G

### Waste Flow Table

## Monthly Summary Waste Flow Table for 2022 (year)

Project : Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station

Contract No.: 7/WSD/21

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (a) (see Note 3)	Reused in the Contract (b)	Reused in other Projects (c)	Disposed as Public Fill (d)	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in Tonne)
Jan											
Feb											
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.160
Jun	94.000	0.000	0.000	0.000	94.000	0.000	0.000	0.000	0.000	0.000	207.370
Sub-total	94.000	0.000	0.000	0.000	94.000	0.000	0.000	0.000	0.000	0.000	208.530
Jul	693.250	0.000	0.000	0.000	693.250	0.000	5.890	0.000	0.000	0.000	9.420
Aug	93.410	0.000	0.000	0.000	93.410	0.000	13.990	0.000	0.000	0.000	7.910
Sep	3985.890	0.000	0.000	0.000	3985.890	0.000	0.000	0.000	0.000	0.000	3.480
Oct	27.110	0.000	0.000	0.000	27.110	0.000	0.000	0.000	0.000	0.000	70.990
Nov	6598.800	0.000	0.000	0.000	6598.800	0.000	0.000	0.000	0.000	0.000	37.250
Dec	4729	0.000	0.000	0.000	4728.82	0.000	0.000	0.518	0.000	0.000	9.08
Total	16221.280	0.000	0.000	0.000	16221.280	0.000	19.880	0.518	0.000	0.000	346.660

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.
  - (3) Broken concrete for recycling into aggregates.
  - (4) Total Quantity Generated = a+b+c+d.

## Monthly Summary Waste Flow Table for 2023 (year)

Project : Construction of Siu Ho Wan Water Treatment Works Extension and Siu Ho Wan Raw Water Booster Pumping Station

Contract No.: 7/WSD/21

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (a) (see Note 3)	Reused in the Contract (b)	Reused in other Projects (c)	Disposed as Public Fill (d)	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in Tonne)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in Tonne)
Jan	2098.160	58.230	0	0	2039.930	457.960	0.000	0.000	0.000	0.000	5.100
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	2098.160	58.230	0.000	0.000	2039.930	457.960	0.000	0.000	0.000	0.000	5.100
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	2098.160	58.230	0.000	0.000	2039.930	457.960	0.000	0.000	0.000	0.000	5.100

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.
  - (3) Broken concrete for recycling into aggregates.
  - (4) Total Quantity Generated = a+b+c+d.

## Appendix H

### Environmental Complaints Log

**Environmental Complaints Log**

<b>Log ref.</b>	<b>Date of complaint</b>	<b>Complaint route</b>	<b>Reference no.</b>	<b>Complaint nature</b>	<b>Investigation fining</b>	<b>Status</b>
1						
2						
3						
4						

## **Appendix I**

### **Implementation Schedule for Environmental Mitigation Measures**



### Environmental Mitigation Implementation Schedule for Air Quality Control

EIA Ref	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines
				D	C	O	
<b>Construction Phase (Air Quality Control)</b>							
S3.8	<p>Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work. Relevant control measures include:</p> <ul style="list-style-type: none"> <li>watering on the work sites at Siu Ho Wan WTW twice a day;</li> <li>skip hoist for material transport shall be totally enclosed by impervious sheeting;</li> <li>vehicle washing facilities shall be provided at every vehicle exit point;</li> <li>the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores;</li> <li>every main haul road shall be sealed with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet;</li> <li>every stock of more than 20 bags of cement shall be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides;</li> <li>all dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;</li> <li>every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the construction sites;</li> <li>the dusty materials stockpiled on site shall be covered; and</li> <li>the load of dusty materials carried by vehicle leaving a construction site shall be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle.</li> </ul>	Work site / during construction period.	Contractor		√		Air Pollution Control (Construction Dust) Regulation
<b>Operation Phase(Air Quality)</b>							
NA	NA	NA	NA	NA	NA	NA	NA
<b>Construction Phase (Noise Control)</b>							
S4.8.1	Use of silenced PME	Work site close to all NSRs	Contractor		√		NCO, EIAO-TM
S4.8.6	<p>Good Site Practices:</p> <ul style="list-style-type: none"> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.</li> <li>Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.</li> <li>Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.</li> <li>Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction programme.</li> </ul>	Work site close to all NSRs / throughout the construction period.	Contractor		√		NCO, EIAO-TM

EIA Ref	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines
				D	C	O	
<b>Operation Phase(Noise Control)</b>							
NA	NA	NA	NA	NA	NA	NA	NA
<b>Construction Phase (Water Quality Control)</b>							
S5.7.2	<p><i>Construction Site Runoff and Drainage</i></p> <ul style="list-style-type: none"> <li>Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.</li> <li>Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.</li> <li>Water pumped out from foundation excavations shall be discharged into silt removal facilities.</li> <li>Exposed soil surfaces shall be protected by paving or fill material as soon as possible to reduce the potential of soil erosion.</li> <li>Open stockpiles of construction materials or construction wastes on-site of more than 50m<sup>3</sup> shall be covered with tarpaulin or similar fabric during rainstorms.</li> </ul>	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO
S5.7.3	<p><i>General Construction Activities</i></p> <ul style="list-style-type: none"> <li>Debris and rubbish generated on-site shall be collected, handled and disposed of properly to avoid entering the nearby watercourses and storm water drains. Stockpiles of cement and other construction materials shall be kept covered when not being used.</li> </ul>	Work site / During the construction period	Contractor		√		ProPECC PN 1/94; WPCO
S5.7.4	<ul style="list-style-type: none"> <li>Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event.</li> </ul>	Work site / During the construction period	Contractor		√		
S5.7.5	<p><i>Sewage from Construction Workforce</i></p> <ul style="list-style-type: none"> <li>Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site. A licensed contractor shall be responsible for appropriate disposal and maintenance of these facilities.</li> </ul>	Work site / During the construction period	Contractor		√		WPCO
<b>Operation Phase(Water Quality Control)</b>							
NA	NA	NA	NA	NA	NA	NA	NA
<b>Construction Phase (Ecology)</b>							
S.6.9.3	<p><i>Mitigation to minimise impacts on vegetation in woodland</i></p> <ul style="list-style-type: none"> <li>All trees shall be preserved as far as possible, especially species of high conservation or amenity value. Recommendations to be provided in the Tree Survey Report to mitigate impacts on trees shall be followed. Where trees are to be preserved in-situ, but are likely to be disturbed from works activities, protective fencing/hoarding shall be carefully set up around the affected trees (refer to</li> </ul>	Work site particularly woodland / During design and construction period	WSD/ Contractor	√	√		EIAO

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EIA Ref	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines
				D	C	O	
S.6.9.4/ S.6.11.2	<p>Landscape and Visual).</p> <ul style="list-style-type: none"> <li>Disturbance of individuals of the shrub/tree species Pavetta hongkongensis and tree Aquilaria sinensis of conservation interest should be avoided. A buffer to the dripline of each plant of at least 1m radius should be demarcated to prohibit disturbance. Where loss of this species would be unavoidable, it is recommended that these plants may be transplanted to safe locations within the same habitat. Following transplantation, regular monitoring of the trees and seedlings should be conducted by a suitably qualified botanist/horticulturist over a 12-month period.</li> </ul>						
S.6.9.5	<p><i>Mitigation to minimise impacts on aquatic ecology</i></p> <ul style="list-style-type: none"> <li>Trench excavation works for the raw water mains near the stream courses should be carried out in the dry season as far as practicable.</li> </ul>	Work site / During construction period	WSD/ Contractor	√	√		
S.6.9.6	<p><i>Mitigation to minimise general disturbance to wildlife</i></p> <ul style="list-style-type: none"> <li>Noise mitigation measures through the use of quiet construction plant shall be implemented to minimise disturbance to habitats adjacent to the works areas.</li> </ul>	Work site / During construction period	Contractor		√		EIAO
S.6.9.7	<p><i>General good site practice</i></p> <ul style="list-style-type: none"> <li>Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats.</li> <li>Construction activities shall be restricted to works areas that shall be clearly demarcated. The works areas shall be reinstated after completion of the works.</li> <li>Waste skips shall be provided to collect general refuse and construction wastes. The wastes shall be disposed of timely and properly off-site.</li> <li>General drainage arrangements shall include sediment and oil traps to collect and control construction site run-off.</li> <li>Open burning on works sites is illegal, and shall be strictly prohibited. Stove fires on works sites shall also not be allowed. Temporary fire fighting equipment shall be provided particularly in woodland areas.</li> </ul>	Work site / During construction period	Contractor		√		EIAO
S.6.9.8.	<p><i>Re-vegetation to reinstate works areas</i></p> <ul style="list-style-type: none"> <li>As far as possible compensatory planting shall use native plants of the same species that occur in the adjacent woodland habitat and have flowers/fruits attractive to wildlife. On-site compensatory planting should be conducted on at least a one to one basis.</li> </ul>	Work site in woodland / Immediately following works	Contractor		√		EIAO
<b>Operation Phase(Ecology)</b>							
NA	NA	NA	NA	NA	NA	NA	NA
<b>Construction Phase (Landscape and Visual Impact)</b>							
S7.9	<ul style="list-style-type: none"> <li>All existing top-soil shall be conserved and reused</li> <li>Temporary hoarding barriers shall be of a recessive visual appearance in both colour and form.</li> <li>Chromatic colour scheme with appropriate texture should be considered while designing the external surface of the proposed SHW Raw Water Booster Pumping Station in order to visually merge the proposed structures into the surrounding landscape.</li> </ul>	During construction phase	Contractor		√		EIAO-TM
<b>Operation Phase(Landscape and Visual Impact)</b>							

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EIA Ref	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines
				D	C	O	
S7.9	<ul style="list-style-type: none"> <li>New compensatory planting works shall be carried out as early as possible in the construction period which allow maximum time for establishment and more mature trees when the works completed.</li> <li>Landscape or compensatory planting shall be provided where appropriate for enhancing greening and achieving visual screening. In this aspect, compensatory tree planting shall be considered. Selection of plant species shall match with the surrounding vegetation type and form for consistency of landscape resources and visual comfort, for matching with the local habitat. Tree planting shall be firstly considered when the amenity area or slope is feasible for planting trees so as to provide visual screening.</li> </ul>	During operation phase	Contractor			√	EIAO-TM
S7.9	<ul style="list-style-type: none"> <li>Planting area of approximately 2000 to 3000mm wide where fast growing tall trees with dense foliage shall be provided along the site boundary of Siu Ho Wan Raw Water Booster Pumping Station for visual screening.</li> <li>For planting close to or surrounded by natural terrain, compensatory planting should be arranged in a semi natural manner where feasible in order to blend the new planting into natural environment.</li> <li>The newly planted trees, shrubs and grassed areas are maintained throughout the first 12 months of the operation stage.</li> </ul>	During operation phase	Contractor			√	EIAO-TM
<b>Waste Management</b>							
S10.5.1 - S10.5.3	<p><i>Good Site Practices</i></p> <p>Good site practices during the construction activities include:</p> <ul style="list-style-type: none"> <li>Nomination of approved personnel, such as a site manager, to be responsible for good site practices and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility.</li> <li>Training of site personnel in proper waste management and chemical waste handling procedures.</li> <li>Provision of sufficient waste disposal points and regular collection for disposal.</li> <li>Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.</li> <li>A Waste Management Plan shall be prepared and submitted to the Engineer for approval. One may make reference to ETWB TCW No. 15/2003 for details.</li> <li>A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed.</li> <li>In order to monitor the disposal of C&amp;D material at public filling areas and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements to be implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may make reference to WBTC No. 21/2002 for details.</li> </ul>	Work site / During the construction period	Contractor			√	Waste Disposal Ordinance (Cap.54)  WBTC No.21/2002, ETWB TCW No. 15/2003
S10.5.4	<p><i>Waste Reduction Measures</i></p> <p>Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction</p>	Work site / During planning & design stage, and construction	WSD/Contractor	√	√		WBTC No.4/98, ETWB TCW No. 15/2003

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EIA Ref	Environmental Protection Measures	Location/Timing	Implementation Agent	Implementation Stages*			Relevant Legislation & Guidelines
				D	C	O	
	include: <ul style="list-style-type: none"> <li>Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.</li> <li>Separate labelled bins shall be provided to segregate aluminium cans from other general refuse generated by the work force, and to encourage collection of by individual collectors.</li> <li>Any unused chemicals or those with remaining functional capacity shall be recycled.</li> <li>Maximising the use of reusable steel formwork to reduce the amount of C&amp;D material.</li> <li>Proper storage and site practices to minimise the potential for damage or contamination of construction materials.</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>	stage					
S10.5.9	<i>General Refuse</i> General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material.	Work site / During the construction period	Contractor		√		Public Health and Municipal Services Ordinance (Cap. 132)
S10.5.7	<i>Construction &amp; Demolition (C&amp;D) Material</i> When disposing C&D material at a public filling area, it shall be noted that the material shall only consist of soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt. The material shall be free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered to be unsuitable by the Filling Supervisor.	Work site / During the construction period	Contractor		√		WBTC No. 4/98, 21/2002, 25/99, 12/2000  ETWB TCW No. 15/2003
S10.5.8	<i>Chemical Wastes</i> If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes shall be used. Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosives, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes generated at the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. All chemical wastes shall be removed from the waterworks installations at the first instance.	Work site / During the construction period	Contractor		√		

Note: N/A Not applicable

\*D – Design; C – Construction; O – Operation