



Drainage Services Department
The Government of the Hong Kong Special Administrative Region




Contract No. DC/2019/07

**Environmental Monitoring Works for
Upgrading of Cheung Chau Sewage Collection, Treatment and
Disposal Facilities**

**25th Monthly Environmental Monitoring and Audit Report –
August 2023**

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Attn: Mr. Titus Yeung – Senior Resident Engineer

Your Reference

Contract No. CM 04/2021

Our Reference
AFK/EC/TC/LL/kl/
T601424122/L061

**Independent Environmental Checker for Environmental Monitoring Works for
Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities**

Environmental Permit No. EP-488/2014/A

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Monthly EM&A Report for August 2023 (Rev. 2)

14 September 2023

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By Email

Dear Sir,

I refer to the Monthly EM&A Report for August 2023 (Rev. 2) under the captioned Project, which was certified on 14 September 2023 by the Environmental Team Leader appointed under Condition 2.1 of Environmental Permit No. EP-488/2014/A (hereafter referred to as "EP").

I hereby verify the abovementioned submission in accordance with EP Conditions 1.9 and 4.4.

Should you have any queries regarding the captioned or require any further information, please contact the undersigned at 2828 5751.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED



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REVISION HISTORY

REV.	DESCRIPTION OF MODIFICATION	DATE
0	First Issue for Comments	11 September 2023
1	Updated according to IEC's comments	13 September 2023
2	Updated according to IEC's comments	14 September 2023

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EXECUTIVE SUMMARY

- A.1 Pursuant to the Environmental Impact Assessment Ordinance (EIAO), the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP-488/2014/A) to DSD for the Project.
- A.2 Upon the requirement of the Environmental Permit (EP), the Monthly EM&A Monitoring Report shall be submitted to the DEP within 10 working days after the end of the reporting month. The submissions shall be verified by the Independent Environmental Checker (IEC) and complied with the requirements set out in the Environmental Monitoring and Audit (EM&A) Manual before submission to the DEP as stipulated in Condition 4.4 of the EP.
- A.3 The commencement date of the Project was 6 August 2021. Impact environmental monitoring of 24-hour TSP, 1-hour TSP and noise was conducted as stipulated in Condition 4.2 of the EP. This is the 25th Monthly EM&A Report for the Project summarizing the monitoring results and audit findings of the EM&A programme at selected locations at and around Cheung Chau during the reporting period from 1 August to 31 August 2023.
- A.4 Key activities carried out in this reporting period for the Project included the followings:
- Trial pit and ground investigation
 - Smart sewage monitoring
 - Excavation and Lateral Support (ELS) at CCSTW
 - Construction of Sludge Digester Building
 - Construction of MBR Treatment Facilities
 - Erection of Tower Crane “XCMG XT335”
 - Energization of Electrical System and Permit to Work Procedure
 - Mechanical Installation of Sludge Digester Building and Sludge Holding Tanks
 - Removal of RMD Strut of ELS at CCSTW
- A.5 The major environmental impacts brought by the above construction works include:
- Construction dust and noise generation from construction works and piling works
 - Wastewater generated from construction activities
 - Waste generation from the construction activities
- A.6 The key environmental mitigation measures implemented for the Project in this reporting period associated with the above construction works include:
- Dust suppression by regular wetting and water spraying for construction works
 - Reduction of noise from equipment and machinery on-site
 - Mitigation measures preventing seepage of muddy water
 - Sorting and storage of general refuse and construction waste
- A.7 Six (6) sessions of air monitoring were carried out at all designated monitoring locations. No exceedance of Action or Limit Level was recorded.
- A.8 Five (5) sessions of noise monitoring were carried out at all designated monitoring locations. No exceedance of Action or Limit Level was recorded.
- A.9 Results of the monitoring for air quality and airborne noise are given in **Table A** and **Table B** as follows:

Table A – Monitoring Results (Dust)

Location	Dust in $\mu\text{g}/\text{m}^3$			
	Average		Range	
	TSP-1hr	TSP-24hr	TSP-1hr	TSP-24hr
A1a	65	50	51 - 77	23 - 117
A2a	48	52	39 - 57	24 - 105

Table B – Monitoring Results (Noise)

Location	Noise in dB(A)	
	Average	Range
	$L_{\text{eq}} (30 \text{ min}) (7:00-19:00)$	$L_{\text{eq}} (30 \text{ min}) (7:00-19:00)$
N2a	71.7	67.3 – 74.0
N3a	73.0	71.2 – 74.4

s: +3 dB(A) free-field corrections have been made to N3a.

- A.10 According to Section 4.3.3 of the EM&A Manual, Site inspection shall be carried out by the ET and attention shall be paid to the mitigation measures recommended for water pollution control. Weekly site inspections were carried out and no non-compliance was spotted during the reporting month.
- A.11 Waste management mitigation measures were properly implemented in the reporting period.
- A.12 For cultural heritage impact, as this Project does not involve proposed sewers works, according to Section 6.1.5 of the EM&A Manual, no EM&A requirement is considered necessary during the construction and operational phase of upgrading of Cheung Chau STW and Pak She SPS.
- A.13 The recommended landscape and visual mitigation measures were properly implemented in the reporting period.
- A.14 Weekly site inspection of the construction work by ET were carried out on 01, 08, 15, 22 and 30 August 2023.
- A.15 No environmental complaint was received during the reporting period.
- A.16 No notification of summons or prosecution was received in the reporting period.
- A.17 A map of the construction site and monitoring locations are shown in [Appendix A](#).
- A.18 The summary of permit / licences for this Project is presented in **Table C** below:

Table C – Summary of Permit / Licences

Contract No. DC/2019/07
 Environmental Monitoring Works for
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities
 25th EM&A Report – August 2023

Nature	Number	Issue Date	Expiry Date
Environmental Permit	EP-488/2014/A	13/05/2021	N/A
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	462303	26/11/2020	N/A
Waste Disposal Billing Account	7039094	21/11/2020	N/A
Waste Disposal (Vessel) Billing Account	7040870	11/07/2023	10/10/2023
Permit issued under the Dumping At Sea Ordinance	EP/MD/23-112	07/03/2023	06/09/2023
Chemical Waste Producer	5213-920-B2500-05	31/12/2020	N/A
Effluent Discharge Licence under Water Pollution Control Ordinance	WT00038597-2021	20/08/2021	31/08/2026

1. INTRODUCTION

1.1. BACKGROUND

- 1.1.1. Drainage Services Department (DSD) has contracted Build King Civil Engineering Limited (BK) to carry out the Outlying Islands Sewerage Stage 2 – Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities under Contract No. DC/2019/07.
- 1.1.2. Acuity Sustainability Consulting Limited (ASCL) is commissioned by BK to undertake the Environmental Team (ET) services as required and/or implied, both explicitly and implicitly, in the Environmental Permit (EP), Environmental Impact Assessment Report (EIA Report) (Register No. AEIAR-181/2013) and Environmental Monitoring and Audit Manual (EM&A Manual) for the Project; and to carry out the Environmental Monitoring and Audit (EM&A) programme in fulfillment of the EIA Report's EM&A requirements under Agreement No. CE 15/2010 (DS).

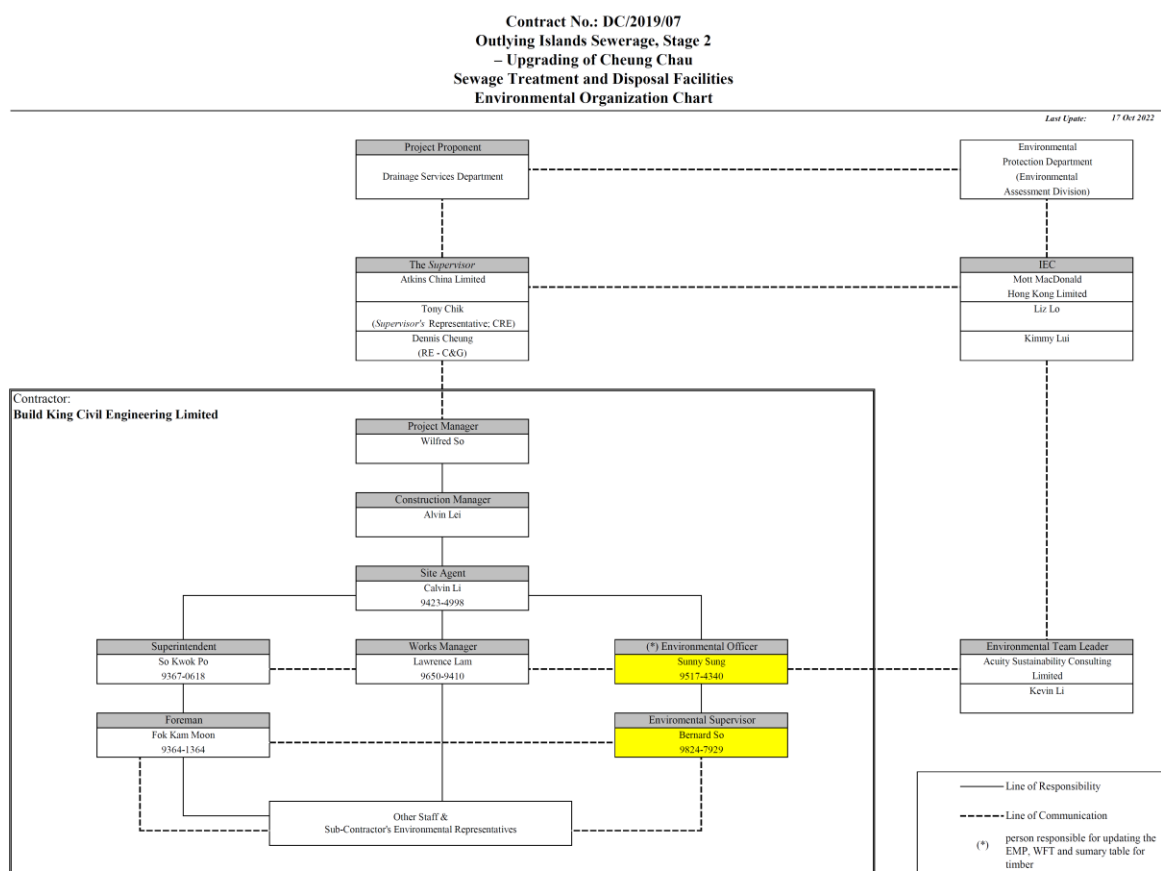
1.2. PROJECT DESCRIPTION

- 1.2.1. The purpose of the Project is to upgrade the sewerage collection, treatment and disposal facilities in Cheung Chau in order to cater for the projected ultimate population and planned developments in Cheung Chau to meet the increased demand and to achieve more stringent effluent quality standards. The key elements of the proposed works for the Project will include as follows:
- Expansion of the sewage treatment capacity and upgrading of the treatment level of the existing Cheung Chau Sewage Treatment Works (Cheung Chau STW) to secondary treatment level; and
 - Expansion of the pumping capacity of the existing Pak She Sewage Pumping Station (Pak She SPS).

1.3. PROJECT ORGANISATION STRUCTURE

- 1.3.1. The Project organization structure is presented in **Figure 1.1**.

Figure 1.1 Project Organization Structure



Party	Role	Contact Person	Phone No.
Drainage Services Department HKSAR (DSD)	Project Proponent	QIU Yujing, Eugene	2594 7298
Supervisor / Supervisor's Representative (Atkins China Limited)	Resident Engineer	Dennis Cheung	2675 3910
Environmental Team (Acuity Sustainability Consulting Limited)	Environmental Team Leader	Kevin Li	2698 6833
Independent Environmental Checker (Mott Macdonald Hong Kong Limited)	Independent Environmental Checker	Liz Lo	2828 5751
Contractor (Build King Construction Limited)	Site Agent	Calvin Li	9423 4998
	Environmental Officer	Sunny Sung	9517 4340

1.4. SUMMARY OF CONSTRUCTION WORKS

1.4.1. Details of the major construction activities undertaken in this and the next reporting periods are shown below. The construction programme is presented in **Appendix B**.

Key activities carried out in this reporting period for the Project included the followings:

- Trial pit and ground investigation
- Smart sewage monitoring
- Excavation and Lateral Support (ELS) at CCSTW
- Construction of Sludge Digester Building
- Construction of MBR Treatment Facilities
- Erection of Tower Crane “XCMG XT335”
- Energization of Electrical System and Permit to Work Procedure
- Mechanical Installation of Sludge Digester Building and Sludge Holding Tanks
- Removal of RMD Strut of ELS at CCSTW

Key activities to be carried out in the next reporting period for the Project included the followings:

- Trial pit and ground investigation
- Smart sewage monitoring
- Excavation and Lateral Support (ELS) at CCSTW
- Construction of Sludge Digester Building
- Construction of MBR Treatment Facilities
- Erection of Tower Crane “XCMG XT335”
- Energization of Electrical System and Permit to Work Procedure
- Mechanical Installation of Sludge Digester Building and Sludge Holding Tanks
- Removal of RMD Strut of ELS at CCSTW

1.5. PURPOSE OF THE REPORT

1.5.1. According to the EM&A Manual for the Project, monitoring for air quality and noise should be conducted throughout the construction period of the Project.

1.5.2. The EM&A requirements for environmental monitoring are set out in the EM&A Manual. Environmental aspect of construction noise and air quality were identified as the key issues requiring implementation of monitoring programme during the construction phase of the Project.

1.5.3. This report is summarizing the monitoring results and audit findings of the EM&A programme during the reporting period from 1 August to 31 August 2023.

2. AIR QUALITY

2.1. AIR QUALITY PARAMETERS

2.1.1. The air quality parameters to be monitored includes:

- 24-hour TSP;
- 1-hour TSP; and

2.2. MONITORING CRITERIA

2.2.1. Dust monitoring was carried out at the designated monitoring location at least once in every six-days to obtain 24-hour TSP samples. One-hour TSP sampling shall also be done at least 3 times in every six-days while the highest dust impact occurs.

2.2.2. Before commencing the impact monitoring, the ET Leader shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the impact monitoring results.

2.2.3. In case of non-compliance with the air quality criteria, additional monitoring as specified in the Action Plan shall be conducted within 24 hours after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified.

2.3. MONITORING REQUIREMENTS AND EQUIPMENT

2.3.1. 1-hour and 24-hour TSP levels were measured to indicate the impacts of construction dust on air quality. The 24-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.

2.3.2. High volume samplers (HVSs) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:

- (i) 0.6 – 1.7 m³ per minute adjustable flow range;
- (ii) equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- (iii) installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- (iv) capable of providing a minimum exposed area of 406 cm²;
- (v) flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- (vi) equipped with a shelter to protect the filter and sampler;
- (vii) incorporated with an electronic mass flow rate controller or other equivalent devices;
- (viii) equipped with a flow recorder for continuous monitoring;
- (ix) provided with a peaked roof inlet;
- (x) incorporated with a manometer;
- (xi) able to hold and seal the filter paper to the sampler housing at horizontal position;
- (xii) easily changeable filter; and

(xiii) capable of operating continuously for a 24-hour period.

- 2.3.3. The ET is responsible for provision of the monitoring equipment. They shall ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the impact monitoring, and ad hoc monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc., shall be clearly labelled.
- 2.3.4. Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The concerned parties such as ER shall properly document the calibration data for future reference. All the data shall be converted into standard temperature and pressure condition.
- 2.3.5. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, he shall submit sufficient information to the ER to prove that the instrument is capable of achieving a comparable result to the HVS. The instrument shall also be calibrated regularly, and the 1-hour sampling shall be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method.

Laboratory Measurement / Analysis

- 2.3.6. A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory shall be HOKLAS accredited.
- 2.3.7. Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling
- 2.3.8. After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.
- 2.3.9. 1-hour TSP levels and 24-hour TSP had been measured with direct reading dust meters and High Volume Samplers respectively. The details of equipment used for monitoring are listed in **Table 2.1**, and the calibration certificates are presented in [Appendix C](#).

Table 2.1 Equipment Used for Air Quality Monitoring

Equipment	Model	Serial Number
Portable Dust Meter – 1-hour TSP	SIBATA Digital Dust Indicator (Model: LD-5R)	2Y6550 2Y6549
High Volume Samplers – 24-hour TSP	Tisch TE-5170X High Volume Air Sampler	1048 1085
Calibrator Kit	Tisch TE-5028A Calibration Kit	3702

2.4. MONITORING LOCATIONS

2.4.1. The ET agreed with the ER and the IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the samplers, the following points were noted:

- (i) a horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
- (ii) no two samplers shall be placed less than 2 meters apart;
- (iii) the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- (iv) a minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- (v) a minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- (vi) no furnace or incinerator flue is nearby;
- (vii) airflow around the sampler is unrestricted;
- (viii) the sampler is more than 20 meters from the dripline;
- (ix) any wire fence and gate, to protect the sampler, shall not cause any obstruction during monitoring
- (x) permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- (xi) a secured supply of electricity is needed to operate the samplers.

2.4.2. The proposed dust monitoring station is presented in **Table 2.2** and the respective locations are shown in Figure 2.1 of the EM&A Manual.

Table 2.2 Proposed Dust Monitoring Stations

ID No.	Location	Nature of Use	Remarks
A1	Cheung King House, Cheung Kwai Estate	Residential	Specified in the EM&A Manual but proposed to change location
A1a	The admin building inside the construction site	Institutional	Proposed alternative location to replace A1
A2	Cheung Chau Slaughter House	Slaughter house	Specified in the EM&A Manual but proposed to change location
A2a	The existing outfall pumping station inside the construction site	Institutional	Proposed alternative location to replace A2


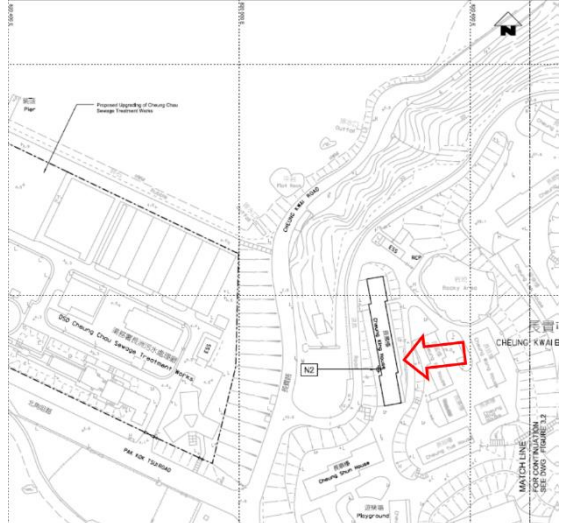

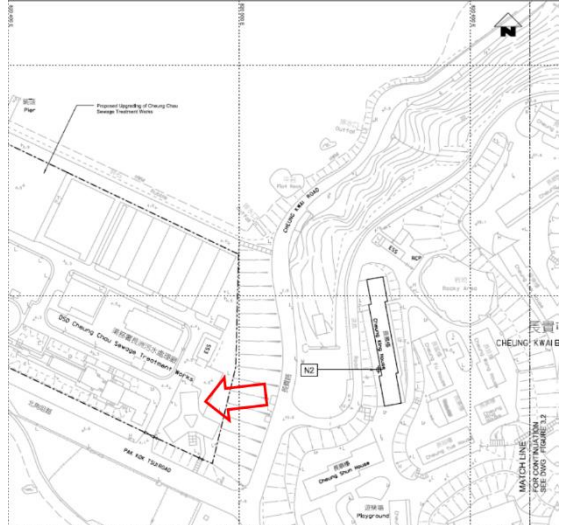
2.4.3. As secured electricity supply was not able to be provided at Monitoring Station A1, Monitoring Station A1a was then proposed. The proposed Monitoring Station A1a is the Admin Building inside the construction site. It is located at a similar direction as A1 from the construction site, but much closer to any major dust emission source than A1.


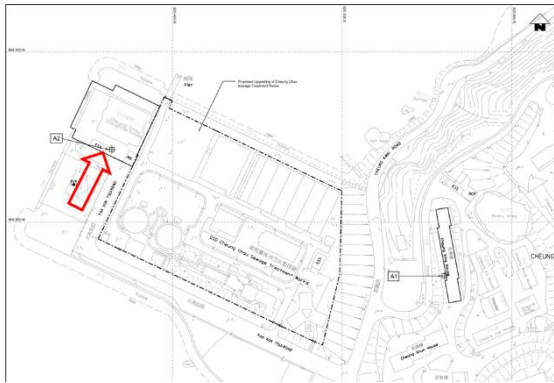
2.4.4. Monitoring Station A2 is now abandoned, only limited access can be granted and power supply cannot be guaranteed which may not be feasible to be a monitoring location. An alternative location A2a, which is the existing outfall pumping station Building inside the construction site. Location A2a is about 30 meter away from the Cheung Chau slaughter

house and closer to the dust emission source.

2.4.5. The proposed alternative monitoring locations meet the guidelines and requirements specified in Section 2.4.1 and 2.4.2 of the EM&A Manual. **Table 2.3** shows the photographs of the air monitoring locations.

Table 2.3 Photo of Proposed HVS Position at Dust Monitoring Stations

ID	HVS Position	Direction of Photo
A1		
<p>The proposed Monitoring Station A1a is the Admin Building inside the construction site. It is located at a similar direction as A1 from the construction site, but much closer to any major dust emission source than A1.</p>		
A1a		

ID	HVS Position	Direction of Photo
A2		

Because Monitoring Station A2 is now abandoned, only limited access can be granted and power supply cannot be guaranteed which may not be feasible to be a monitoring location.

A2a		
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2.5. RESULTS AND ANALYSIS

2.5.1. The 1-hour TSP and 24-hour TSP measurement data are shown in [Appendix D](#) and summarized in [Table 2.4](#) and [Table 2.5](#) respectively.

Table 2.4 Summary of 1-hour TSP Monitoring Results

Monitoring Location	Average($\mu\text{g}/\text{m}^3$)	Range($\mu\text{g}/\text{m}^3$)
A1a	65	51 - 77
A2a	48	39 - 57

Table 2.5 Summary of 24-hour TSP Monitoring Results

Monitoring Location	Average($\mu\text{g}/\text{m}^3$)	Range($\mu\text{g}/\text{m}^3$)
A1a	50	23 - 117
A2a	52	24 - 105

2.6. ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

2.6.1. The baseline monitoring results formed the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 24-hour TSP and 1-hour TSP. **Table 2.6** shows the air quality criteria, namely Action and Limit levels to be used.

Table 2.6 Action / Limit Levels for Air Quality

Parameters	Action Level	Limit Level
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	<p>For baseline level $\leq 200 \mu\text{g}/\text{m}^3$ $AL = (BL * 1.3 + LL)/2$</p> <p>For baseline level $> 200 \mu\text{g}/\text{m}^3$ $AL = LL$</p>	260 $\mu\text{g}/\text{m}^3$
24-hour TSP Level in $\mu\text{g}/\text{m}^3$	<p>For baseline level $\leq 384 \mu\text{g}/\text{m}^3$ $AL = (BL * 1.3 + LL)/2$</p> <p>For baseline level $> 384 \mu\text{g}/\text{m}^3$ $AL = LL$</p>	500 $\mu\text{g}/\text{m}^3$

2.6.2. The derived Action/Limit Levels are presented in **Table 2.7**.

Table 2.7 Derived Action / Limit Levels for Air Quality

Parameters	Monitoring Location	Action Level $\mu\text{g}/\text{m}^3$	Limit Level $\mu\text{g}/\text{m}^3$
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	A1a	151	260
	A2a	154	
24-hour TSP Level in $\mu\text{g}/\text{m}^3$	A1a	270	500
	A2a	271	

2.7. EVENT AND ACTION PLAN

2.7.1. Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in **Table 2.8** shall be carried out.

Table 2.8 Event and Action Plan for Air Quality (Construction Dust)

EVENT	ACTION PLAN FOR CONSTRUCTION DUST			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; and 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; and 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; and 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; and 5. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; and 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to IEC within 3 working days of notification; 2. Implement the agreed proposals; and 3. Amend proposal if appropriate.

3. NOISE

3.1. MONITORING CRITERIA

- 3.1.1. Impact monitoring was conducted once a week between 07:00-19:00 hours on normal weekdays.
- 3.1.2. **Table 3.1** summarizes the monitoring parameters, frequency and duration of the noise monitoring.

Table 3.1 Noise Monitoring Parameters, Time, Frequency and Duration

Time	Duration	Interval	Parameters
Daytime: 0700-1900 hrs	Once per week	Continuously in L _{eq} 5min/L _{eq} 30min (average of 6 consecutive L _{eq} 5min)	L _{eq} 5min, L _{eq} 30min, L ₁₀ & L ₉₀

3.2. MONITORING REQUIREMENTS AND EQUIPMENT

- 3.2.1. Sound level meters and calibrators shall comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specification as referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance.
- 3.2.2. Sound level meters were calibrated using a portable calibrator prior to and following each noise measurement. Where the difference between the calibration levels is greater than 1.0 dB(A), the measurement shall be repeated. Calibrated hand-held anemometers were supplied for the measurement of wind speeds during noise monitoring periods.
- 3.2.3. Noise measurements should not be made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 3.2.4. The details of equipment used for impact monitoring are listed in **Table 3.2**, and the calibration certificates are presented in [Appendix E](#).

Table 3.2 Equipment Used for Noise Monitoring

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK 971	C119577
Acoustic Calibrator	Rion NC-75	35124528

3.3. MONITORING LOCATION


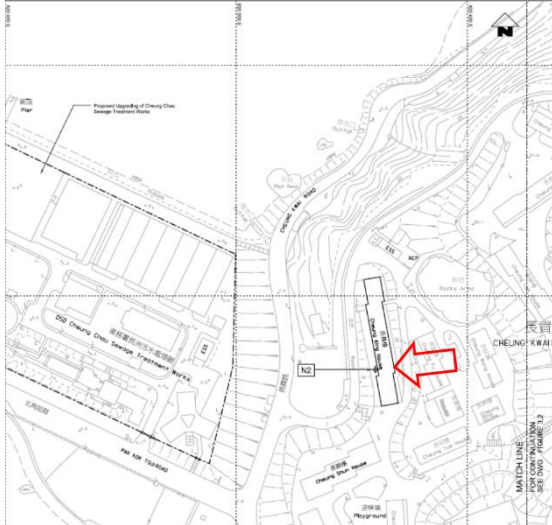

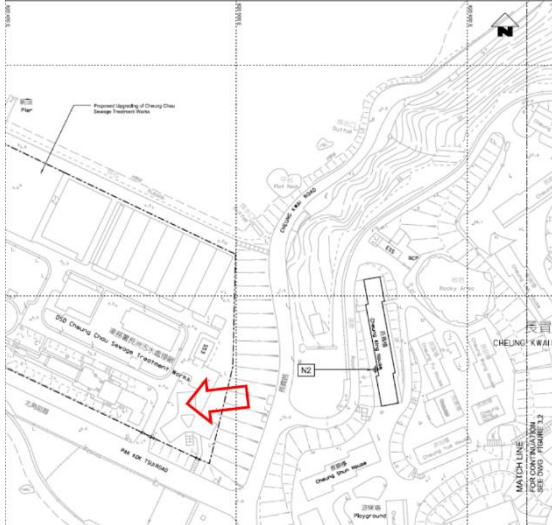


- 3.3.1. According to the environmental findings detailed in the EIA report, the designated locations for the construction noise monitoring are listed in **Table 3.3** and shown in Figure 3.1 – 3.8 of the EM&A Manual.

Table 3.3 Noise Monitoring Stations for Noise Monitoring


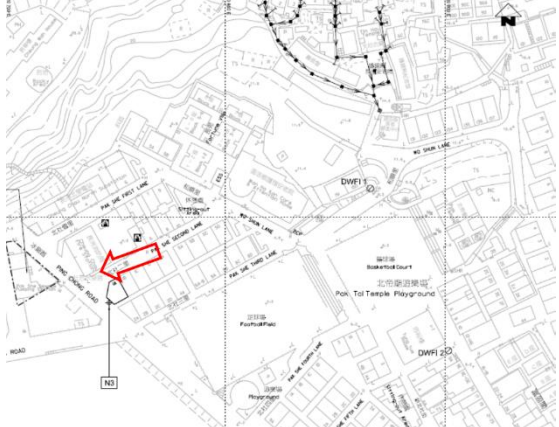
ID No.	Location	Nature of Uses	Remarks	Façade/Free-field
N2	Cheung King House, Cheung Kwai Estate	Residential	Specified in the EM&A Manual but proposed to change location	Façade
N2a	Admin Building inside the Construction Site	Institutional	Proposed alternative location to replace N2	Façade
N3	No. 1A Pak She Second Lane	Residential	Specified in the EM&A Manual but proposed to change location	Free-field
N3a	Cheung Chau Fire Station	Fire Station	Proposed alternative location to replace N3	Free-field

- 3.3.2. For this Contract, only N2 and N3 need to be monitored since all the other monitoring stations specified in the EM&A Manual are for sewers works but this Contract does not include sewers works.
- 3.3.3. The proposed Monitoring Station N2a is the Admin Building inside the construction site. It is located at a similar direction as N2 from the construction site, but much closer to any major noise emission source than N2.
- 3.3.4. According to Figure 3.3 of the EM&A Manual, Location N3 is placed in front of a restaurant on Ping Chong Road. It may pose potential danger to pedestrians, cyclists, drivers and the equipment. A proposed monitoring location N3a, which is about 5 m away from the original monitoring location. N3a is at the corner of the Cheung Chau Fire Station. This location is more safe and meets the guidelines and requirements specified in Section 3.4.1 and 3.4.2 of the EM&A Manual.
- 3.3.5. The monitoring locations should normally be made at a point 1m from the exterior of the NSRs building façade and be at a position 1.2m above the ground. **Table 3.4** showed photographs and indications of the proposed position of sound level meters to be placed for the baseline and impact monitoring.

Table 3.4 Photo of Proposed Sound Level Meter Position at Noise Monitoring Stations

ID	Sound Level Meter Position	Direction of Photo
N2		
<p>The proposed Monitoring Station N2a is the Admin Building inside the construction site. It is located at a similar direction as N2 from the construction site, but much closer to any major noise emission source than N2.</p>		
N2a		
N3		

According to Figure 3.3 of the EM&A Manual, Location N3 is placed in front of a restaurant on Ping Chong Road. It may pose potential danger to pedestrians, cyclists, drivers and the equipment.

ID	Sound Level Meter Position	Direction of Photo
N3a		

3.4. RESULTS AND ANALYSIS

3.4.1. The noise monitoring was carried out in July 2023. The measurement data are shown in [Appendix F](#) and summarized in **Tables 3.5**.

Table 3.5 Summary of Noise Monitoring Results

Monitoring Location	Time Period	Average[dB(A)]	Range[dB(A)]
N2a	Daytime (0700-1900)	71.7	67.3 – 74.0
N3a	Daytime (0700-1900)	73.0	71.2 – 74.4

s: +3 dB(A) free-field corrections have been made to the data of N3a.

3.5. ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

3.5.1. The Action and Limit levels for construction noise are shown in **Table 3.6**. All NSRs identified in the Project are classified with an Area Sensitivity Rating (ASR) A in accordance with the Technical Memorandum on Noise from Construction Work Other Than Percussive Piling.

Table 3.6 Action / Limit Levels for Construction Noise

Time Period	Action	Limit
07:00-19:00 hours on normal weekdays;	When one or more documented complaints are received	75dB(A)

3.6. EVENT AND ACTION PLAN

3.6.1. Should non-compliance of the noise monitoring criteria occur, actions in accordance with the Action Plan in **Table 3.7** shall be carried out.

Table 3.7 Event and Action Plan for Construction Noise

Event	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and contractor and formulate remedial measures; and 5. Increase monitoring frequency to check the effectiveness of mitigation measures. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; and 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; and 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; and 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD & Contractor; 2. Identify source and investigate the cause of exceedance; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ET, ER and Contractor on the potential remedial actions; and 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; and 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; and 5. Stop the relevant portion of works as determined by ER, until the exceedance is abated.

4. WATER QUALITY

- 4.1. As suggested in Section 4.3 of the EM&A Manual, regular site audit was carried out to ensure that the recommended mitigation measures were properly implemented during the construction phase of upgrading of Cheung Chau STW and Pak She SPS. Site audit included site inspections and compliance audits were conducted in the reporting period.
- 4.2. Site inspection was carried out by the ET on 01, 08, 15, 22 and 30 August 2023. No major deficiency was observed and the implementation of recommended for water pollution control was considered satisfactory.
- 4.3. Compliance audits were undertaken that a valid discharge license was issued by EPD on 20 August 2021. The Contractor was reminded to make sure any effluent discharge from construction activities of the Project site should meet the requirements stipulated in the discharge license and monitoring of the treated effluent quality from the Works Areas should be carried out in accordance with the Water Pollution Control Ordinance license that is under the ambit of the relevant regional EPD office.
- 4.4. According to the Specific Conditions B2 in Part B of the discharge licence issued under WPCO, a sample of discharge was taken on 21 August 2023 for testing. The quality of the discharge compliance with the requirements of the discharge licence.

5. WASTE MANAGEMENT

- 5.1. The waste generated from this Project includes inert construction and demolition (C&D) materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are presented in **Table 5.1**.

6. LANDSCAPE & VISUAL

- 6.1. The EIA Report has recommended landscape and visual mitigation measures to be undertaken during construction and operational phases of the upgrading of Cheung Chau STW under this Project. The implementation and maintenance of landscape mitigation measures were checked to ensure that they are fully realized and that potential conflicts between the proposed landscape measures and any other project works and without compromise to the intention of the mitigation measures.
- 6.2. Regular audits were carried out to ensure all the recommended landscape and visual mitigation measures were effectively implemented.
- 6.3. The EM&A Manual proposed mitigation measures were checked on a regular basis to ensure compliance with the intended aims of the EIA.

7. SITE INSPECTION AUDIT

- 7.1. Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting period, site inspections were carried out on 01, 08, 15, 22 and 30 August 2023. A joint site inspection with IEC was carried out on 30 August 2023.
- 7.2. Environmental deficiencies were observed during weekly site inspection. Key observations during the site inspections and during the reporting period are summarized in **Table 7.1**.

Table 7.1 Site Observations

Date	Environmental Observations	Follow-up Status	Reminders
01 August 2023	NIL	N/A	NIL
08 August 2023	NIL	N/A	1. Contractor have been reminded to clear the leaves on top of the drainage
15 August 2023	1. Drainage should be maintained properly	Drainage was maintained in good condition.	1. Contractor have been reminded to clean the haul road after daily construction activities.
22 August 2023	1. Drainage should be covered and surrounded by sandbags to prevent muddy water flow in. (Inside the construction site)	Sand bags were put around gullies to avoid seepage of muddy runoff.	1. Haul road should be cleaned regularly after daily construction activities

Date	Environmental Observations	Follow-up Status	Reminders
30 August 2023	1. Mud should be cleared in the drainage (entrance) 2. Rock breaker of heavy machine should be placed on tarpaulins sheet and covered with tarpaulins sheet.	The U-channel was cleaned. The rock breaker was removed.	NIL

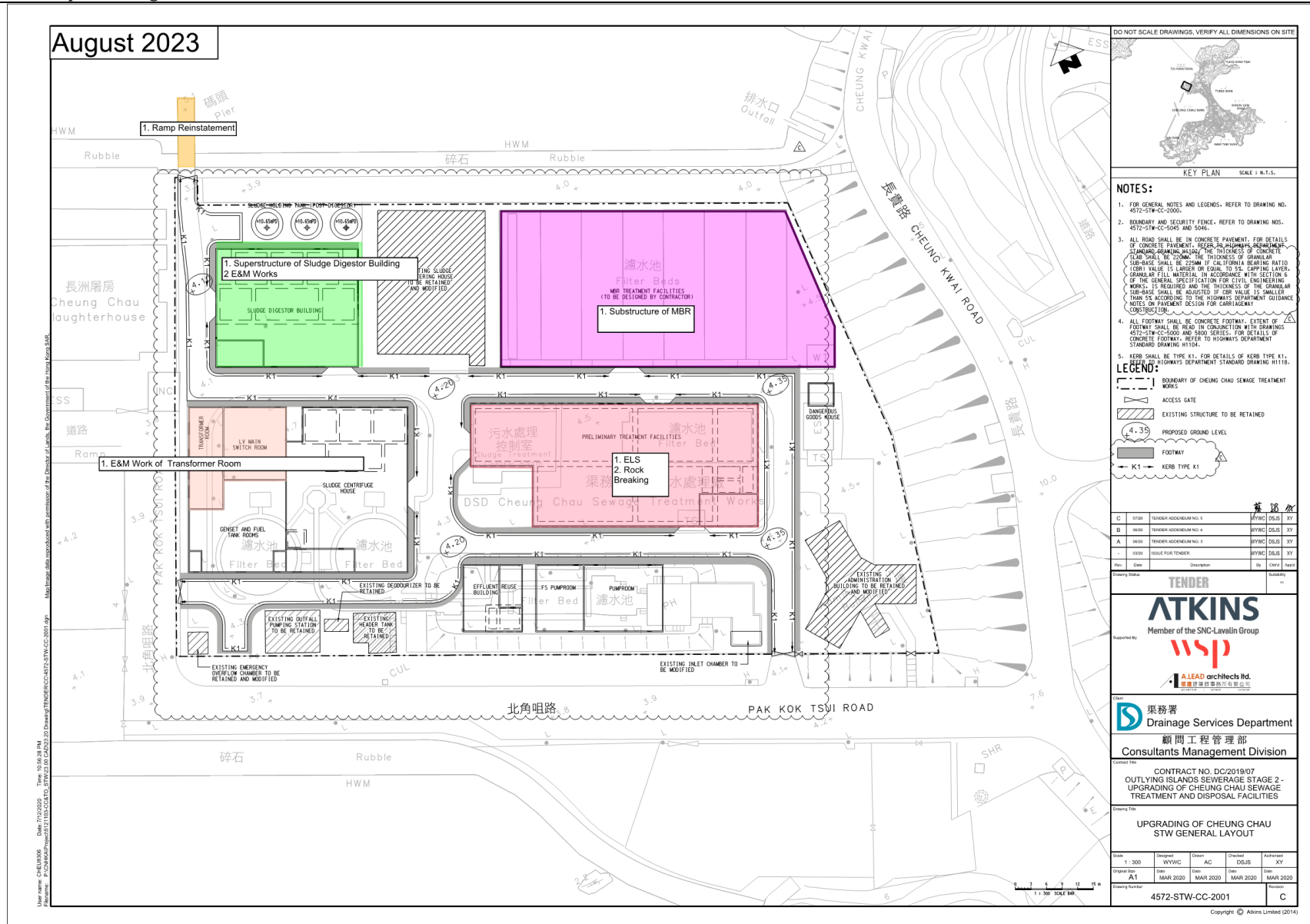
7.3. According to the EIA Study Report, Environmental Permit, contract documents and EM&A Manual, the mitigation measures detailed in the documents should be implemented as much as practical during the reporting period. An updated Implementation Status of Environmental Mitigation Measures (EMIS) is provided in **Appendix G**.

8. CONCLUSION

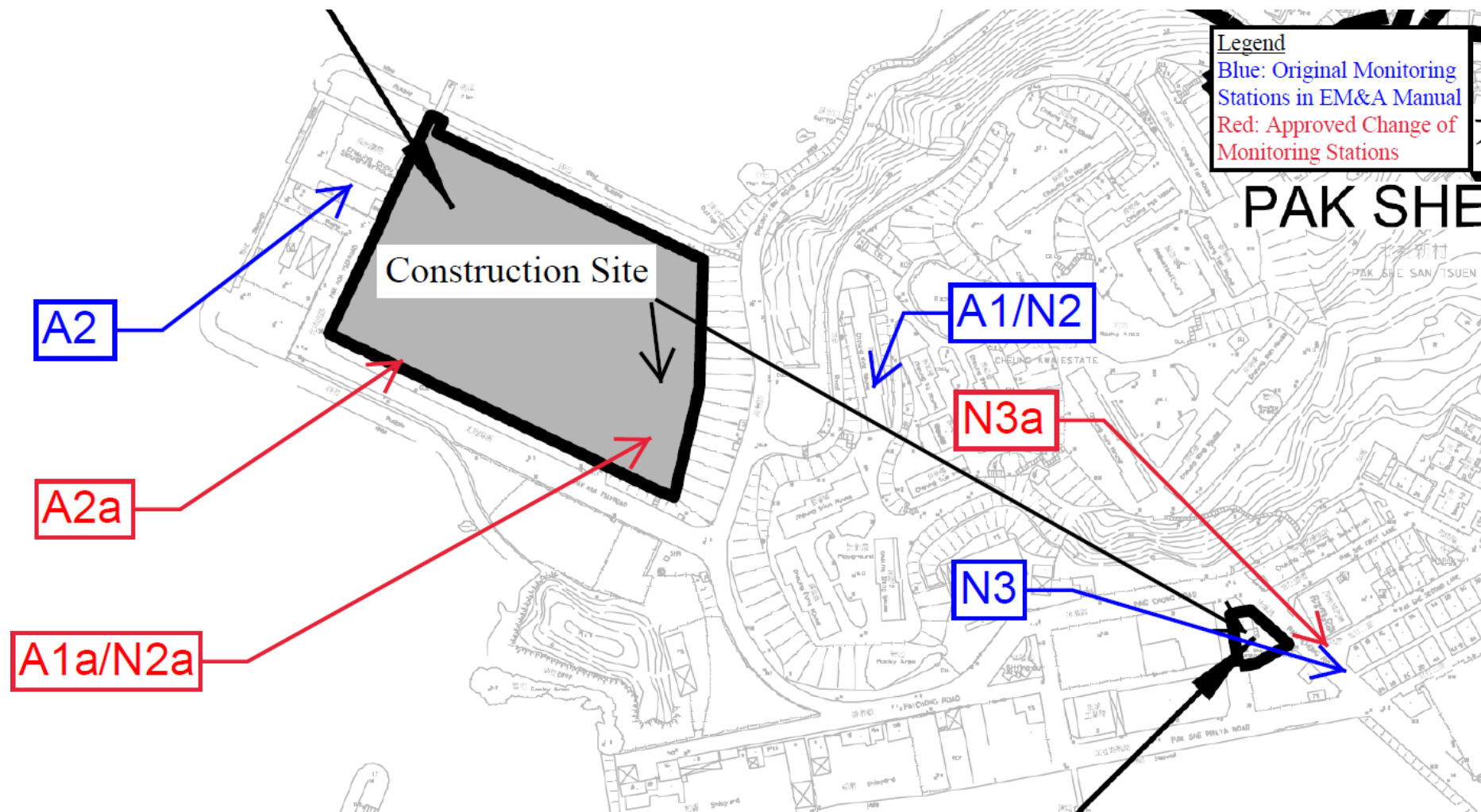
- 8.1. This is the 25th Monthly EM&A Report for the Project which summarizes the key findings of the programme during the reporting period from 1 August to 31 August 2023, in accordance with the EM&A Manual and the requirement under EP-488/2014/A.
- 8.2. Six (6) sessions of air and Five (5) sessions of noise monitoring were carried out at the monitoring locations sited at Cheung Chau in the reporting month.
- 8.3. Site audits were conducted as mitigation measures recommended for water pollution control and landscape and visual impact monitoring in the reporting period. Proper mitigation measures were implemented.
- 8.4. Weekly environmental site inspections were conducted during the reporting period. Only minor deficiencies were observed during site inspections. The environmental performance of the project was therefore considered satisfactory.
- 8.5. No exceedance of Action or Limit Level was recorded in the reporting period.
- 8.6. No environmental complaint was received in the reporting period.
- 8.7. No notification of summons or prosecution was received during the reporting period.

APPENDIX A

Location Plan and Noise and Dust Monitoring Stations



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APPENDIX B

Construction Programme

APPENDIX C

Calibration Certificates

(Air Monitoring)



RECALIBRATION DUE DATE:
March 31, 2024

Certificate of Calibration

Calibration Certification Information			
Cal. Date: March 31, 2023	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 748.54	mm Hg
Calibration Model #: TE-5028A	Calibrator S/N: 3702		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3110	4.1	1.50
2	3	4	1	1.0280	6.7	2.50
3	5	6	1	0.9340	8.1	3.00
4	7	8	1	0.8680	9.4	3.50
5	9	10	1	0.6580	16.2	6.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(Ta/Pa \right)}$ (y-axis)
0.9929	0.7573	1.2237	0.9945	0.7586	0.7676
0.9894	0.9624	1.5798	0.9910	0.9641	0.9909
0.9875	1.0573	1.7306	0.9892	1.0591	1.0855
0.9858	1.1357	1.8693	0.9874	1.1376	1.1725
0.9767	1.4844	2.4474	0.9784	1.4869	1.5351
QSTD	m=	1.68024	QA	m=	1.05214
	b=	-0.04353		b=	-0.02731
	r=	0.99994		r=	0.99994

Calculations	
Vstd= $\Delta Vol / ((Pa - \Delta P) / Pstd) (Tstd / Ta)$	Va= $\Delta Vol / ((Pa - \Delta P) / Pa)$
Qstd= $Vstd / \Delta Time$	Qa= $Va / \Delta Time$

For subsequent flow rate calculations:	
Qstd= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left(\left(\sqrt{\Delta H \left(Ta/Pa \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH:	calibrator manometer reading (in H2O)
ΔP:	rootsmeter manometer reading (mm Hg)
Ta:	actual absolute temperature (°K)
Pa:	actual barometric pressure (mm Hg)
b:	intercept
m:	slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30.

Tisch Environmental, Inc.
 145 South Miami Avenue
 Village of Cleves, OH 45002

www.tisch-env.com
 TOLL FREE: (877)263-7610
 FAX: (513)467-9009



HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	The existing outfall pumping station inside the construction site	Site ID:	A2A	Date:	01-Aug 2023
Serial No.:	1085	Model:	TE-5170X	Operator:	Andy Li

Ambient Condition

Actual Pressure during Calibration (P _a) (mm Hg):	751.4	Actual Temperature during Calibration (T _a) (deg K):	303.3
---	-------	--	-------

Calibration Orifice

Model:	TE-5028A	Slope (m _s):	1.68024
Serial No.:	4167	Intercept (b _s):	-0.04353
Calibration Due Date:	19-Jun-24	Corr. Coeff:	0.99994

Calibration Data

Plate or Test #	ΔH ₂ O (in)	Q _a , X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
18	2.60	0.972	36.0	35.48
13	4.70	1.298	45.0	44.35
10	5.80	1.439	50.0	49.28
7	6.60	1.533	53.0	52.24
5	8.10	1.695	59.0	58.15

Sampler Calibration Relationship (Q_a on x-axis, IC on y-axis)

m = 31.1856 b = 4.6386 Corr. Coeff = 0.9977

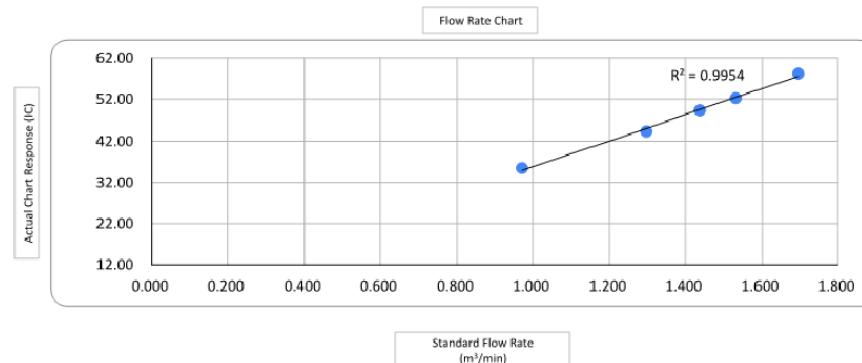
Calculations

$$Q_a = 1/m_c \cdot [\text{Sqrt}(\Delta H_2O \cdot (P_a/P_{Std}) \cdot (T_{Std}/T_a)) - b_c]$$

$$IC = I \cdot (\text{Sqrt}(P_a/P_{Std}) \cdot (T_{Std}/T_a))$$

Q_a = actual flow rate
 IC = corrected chart response
 I = actual chart response
 m_c = calibrator slope
 b_c = calibrator intercept

m = sampler slope
 b = sampler intercept
 T_{Std} = 298 deg K
 P_{Std} = 760 mm Hg
 T_a = actual temperature during calibration (deg K)
 P_a = actual pressure during calibration (mm Hg)



Checked by: Tandy Tse
 Senior Consultant, Environmental

Date: 01-Aug 2023



SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL. +81-48-933-1582 FAX. +81-48-933-1591

Date: January 23th, 2023

CALIBRATION CERTIFICATE

Equipment Name : Digital Dust Indicator, Model LD-5R
Code No. : 080000-73
Quantity : 1 unit
Serial No. : 2Y6549
Sensitivity : 0.001 mg/m³
Sensitivity Adjustment : 549 CPM
Scale Setting : November 15th, 2022.

We hereby certify that the above mentioned instrument has been calibrated satisfactory.

Sincerely

(Signature) *Tong Zhang*
Tong Zhang
Overseas & New Business Group
Overseas Sales Department





SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL. +81-48-933-1582 FAX. +81-48-933-1591

Date: January 23th, 2023

CALIBRATION CERTIFICATE

Equipment Name : Digital Dust Indicator, Model LD-5R
Code No. : 080000-73
Quantity : 1 unit
Serial No. : 2Y6550
Sensitivity : 0.001 mg/m³
Sensitivity Adjustment : 665 CPM
Scale Setting : November 15th, 2022.

We hereby certify that the above mentioned instrument has been calibrated satisfactory.

Sincerely

(Signature) *Tong Zhang*
Tong Zhang
Overseas & New Business Group
Overseas Sales Department



APPENDIX D

Monitoring Data (Air)

Location: A1a

Monitoring Period: August 2023

Parameter: TSP 1-hour

Major Dust Source Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	1 st Hour (µg/m ³)	2 nd Hour (µg/m ³)	3 rd Hour (µg/m ³)
1/8/2023	Sunny	13:47	57	66	68
7/8/2023	Sunny	13:32	71	77	65
14/8/2023	Sunny	14:13	66	67	62
21/8/2023	Sunny	14:24	67	73	75
28/8/2023	Sunny	13:36	53	54	51
31/8/2023	Sunny	10:07	64	65	69
Average			65		
Range			51 - 77		

Location: A2a

Monitoring Period: August 2023

Parameter: TSP 1-hour

Major Dust Source Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	1 st Hour (µg/m ³)	2 nd Hour (µg/m ³)	3 rd Hour (µg/m ³)
1/8/2023	Sunny	13:30	56	48	47
7/8/2023	Sunny	13:24	45	39	46
14/8/2023	Sunny	14:00	55	50	55
21/8/2023	Sunny	14:07	47	44	43
28/8/2023	Sunny	13:09	39	44	41
31/8/2023	Sunny	09:51	45	57	55
Average			48		
Range			39 - 57		

Figure D.1 Measured 1-Hour TSP at the admin building inside the construction site (A1a)

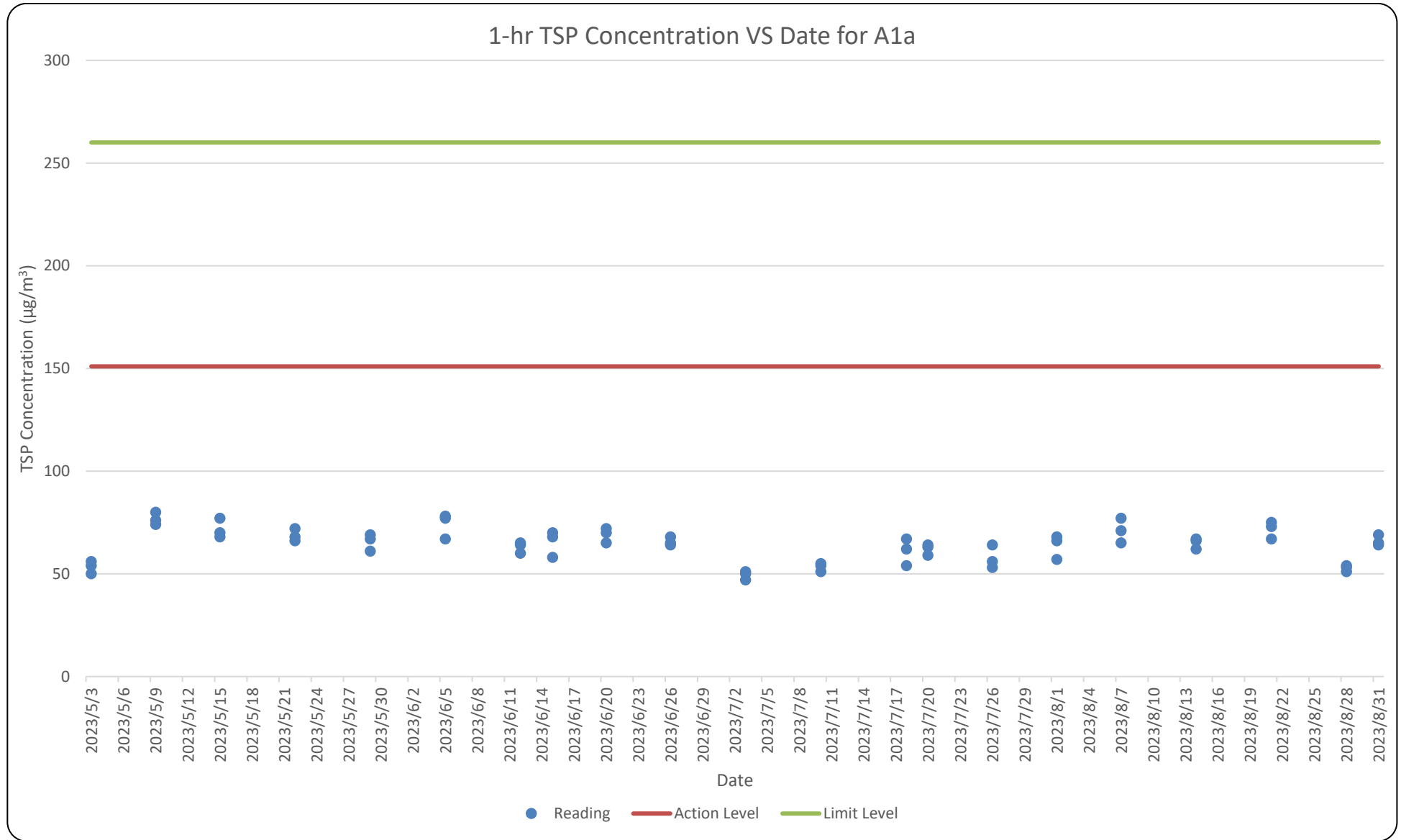
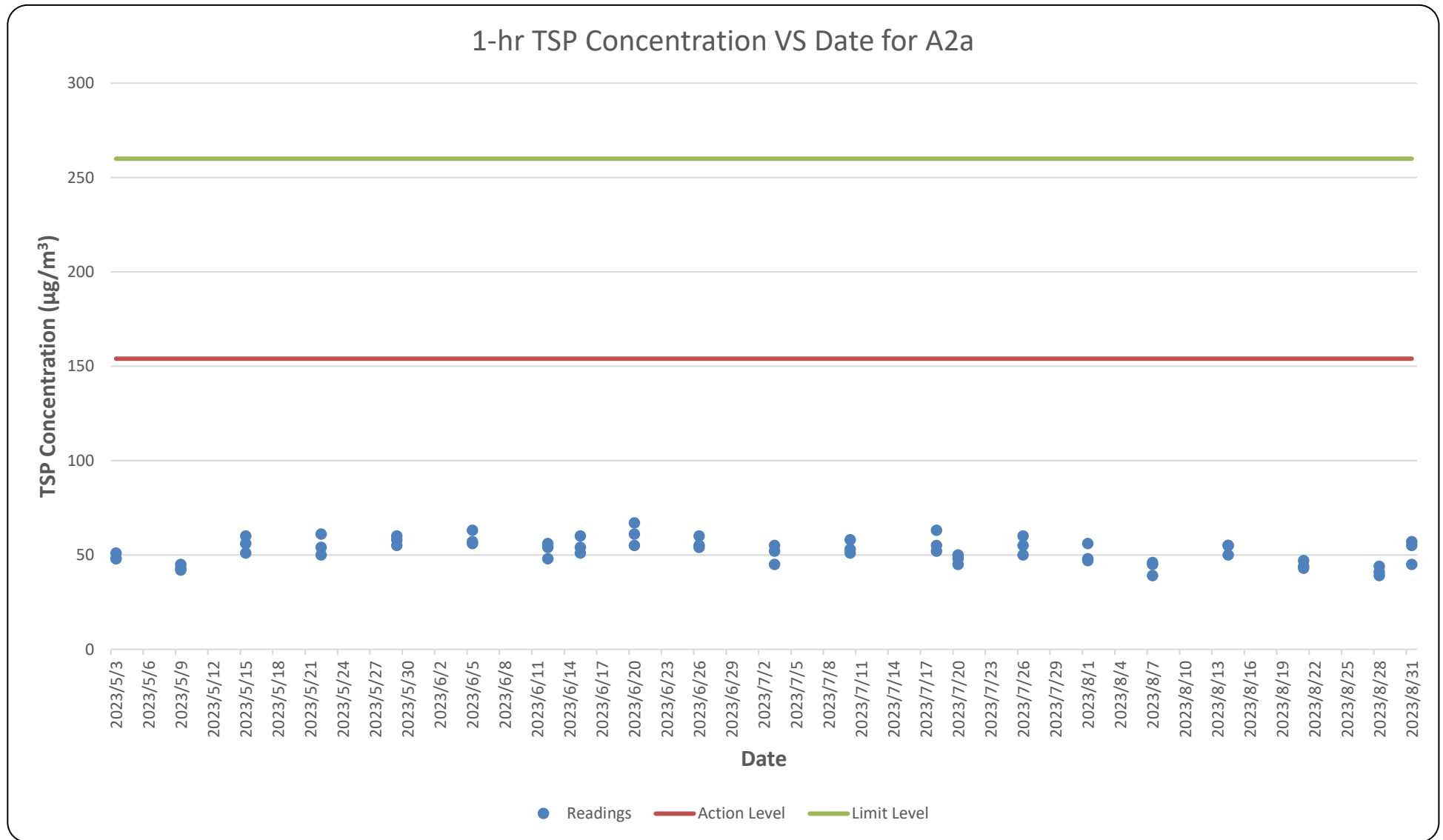


Figure D.2 Measured 1-Hour TSP at the existing outfall pumping station inside the construction site (A2a)



Location: A1a
 Parameter: TSP 24-hour
 Major dust source: Construction activities and daily operation of the sewerage treatment plant
 Other Factors: NA

Start Date	Avg Air Temp	Avg Atmospheric Pressure (mm Hg)	Weather Condition	Elapse Time		Sampling Time (min)	Flow Rate (m ³ /min)	Standard Air Volume (m ³)	Filter Weight (g)		Particulate weight (g)	Conc. (µg/m ³)
	(°C)			Initial (min)	Final (min)				Initial	Final		
01/08/2023	29.9	1004.2	Sunny	290546.0	292088.0	1542	1.27	1963	2.6503	2.6960	0.0457	23
07/08/2023	30.2	1002.7	Sunny	292088.0	293608.0	1520	1.27	1930	2.6797	2.7566	0.0769	40
14/08/2023	29.7	1006.0	Sunny	293608.0	295060.0	1452	1.28	1853	2.6840	2.7324	0.0484	26
21/08/2023	29.8	1007.0	Sunny	295060.0	296526.0	1466	1.28	1872	2.6799	2.7925	0.1126	60
28/08/2023	29.5	1003.1	Sunny	296526.0	298025.0	1499	1.27	1907	2.7432	2.8135	0.0703	37
31/08/2023	28.1	999.5	Sunny	298025.0	299512.0	1487	1.27	1889	2.7419	2.9623	0.2204	117
											Average	50
											Range	23-117

Location: A2a
 Parameter: TSP 24-hour
 Major Site Activities: Construction activities and daily operation of the sewerage treatment plant
 Major dust source: Routine operation of the Sewage Treatment Plant
 Other Factors: NA

Start Date	Avg Air Temp	Avg Atmospheric Pressure	Weather Condition	Elapse Time		Sampling Time	Flow Rate	Standard Air Volume	Filter Weight (g)		Particulate weight (g)	Conc. (µg/m ³)
	(°C)	(mm Hg)		Initial (min)	Final (min)				Actual (min)	(m ³ /min)		
01/08/2023	29.9	1004.2	Sunny	509239.0	510785.0	1546	1.18	1817	2.6515	2.7314	0.0799	44
07/08/2023	30.2	1002.7	Sunny	510785.0	512298.0	1513	1.17	1774	2.6747	2.7727	0.0980	55
14/08/2023	29.7	1006.0	Sunny	512298.0	513753.0	1455	1.08	1576	2.6733	2.7412	0.0679	43
21/08/2023	29.8	1007.0	Sunny	513753.0	515216.0	1463	1.15	1679	2.6829	2.7233	0.0404	24
28/08/2023	29.5	1003.1	Sunny	515216.0	516727.0	1511	1.05	1584	2.7327	2.7967	0.0640	40
31/08/2023	28.1	999.5	Sunny	516727.0	518200.0	1473	1.20	1774	2.7364	2.9228	0.1864	105
											Average	52
											Range	24-105

Figure D.3 Measured 24-Hour TSP at the admin building inside the construction site (A1a)

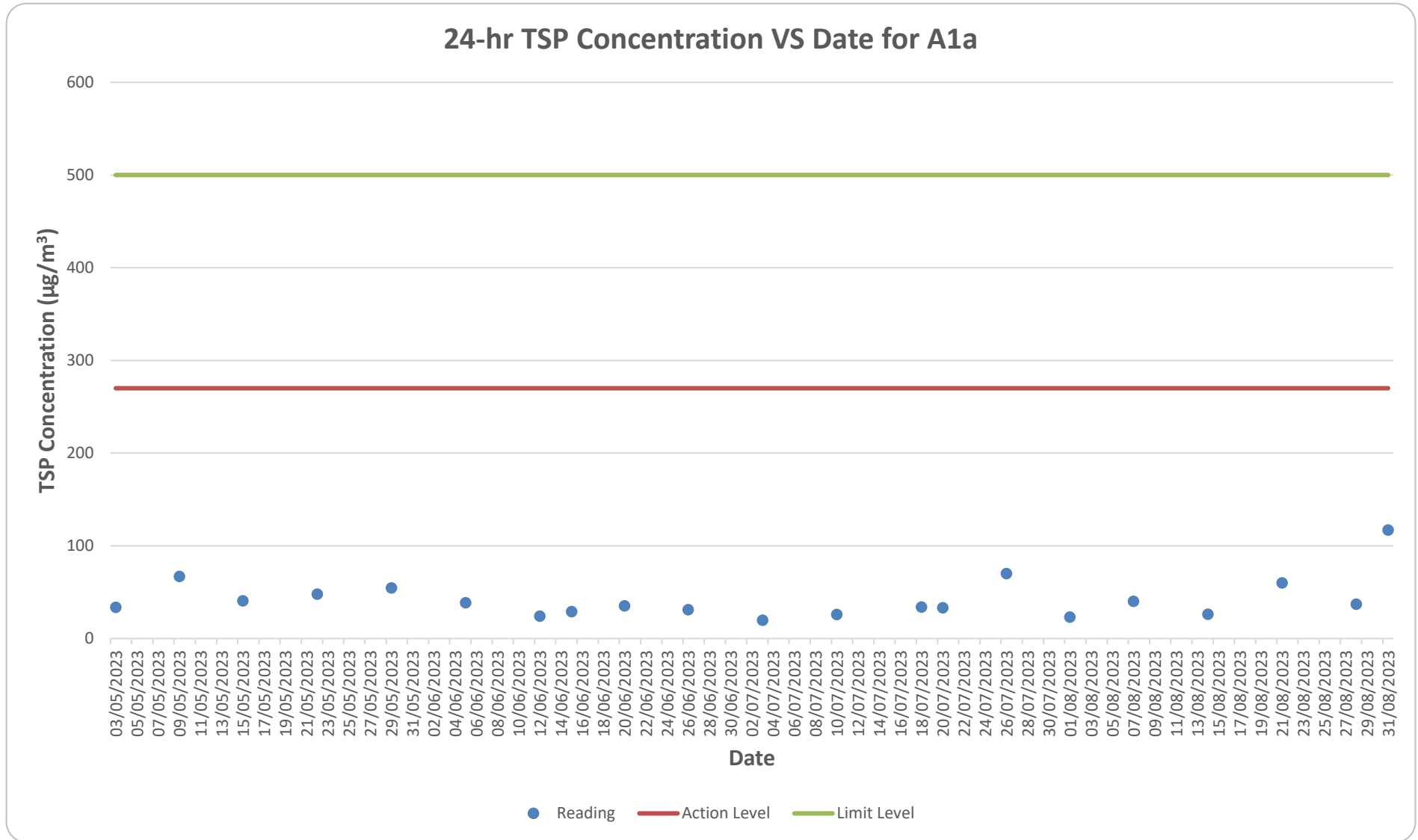
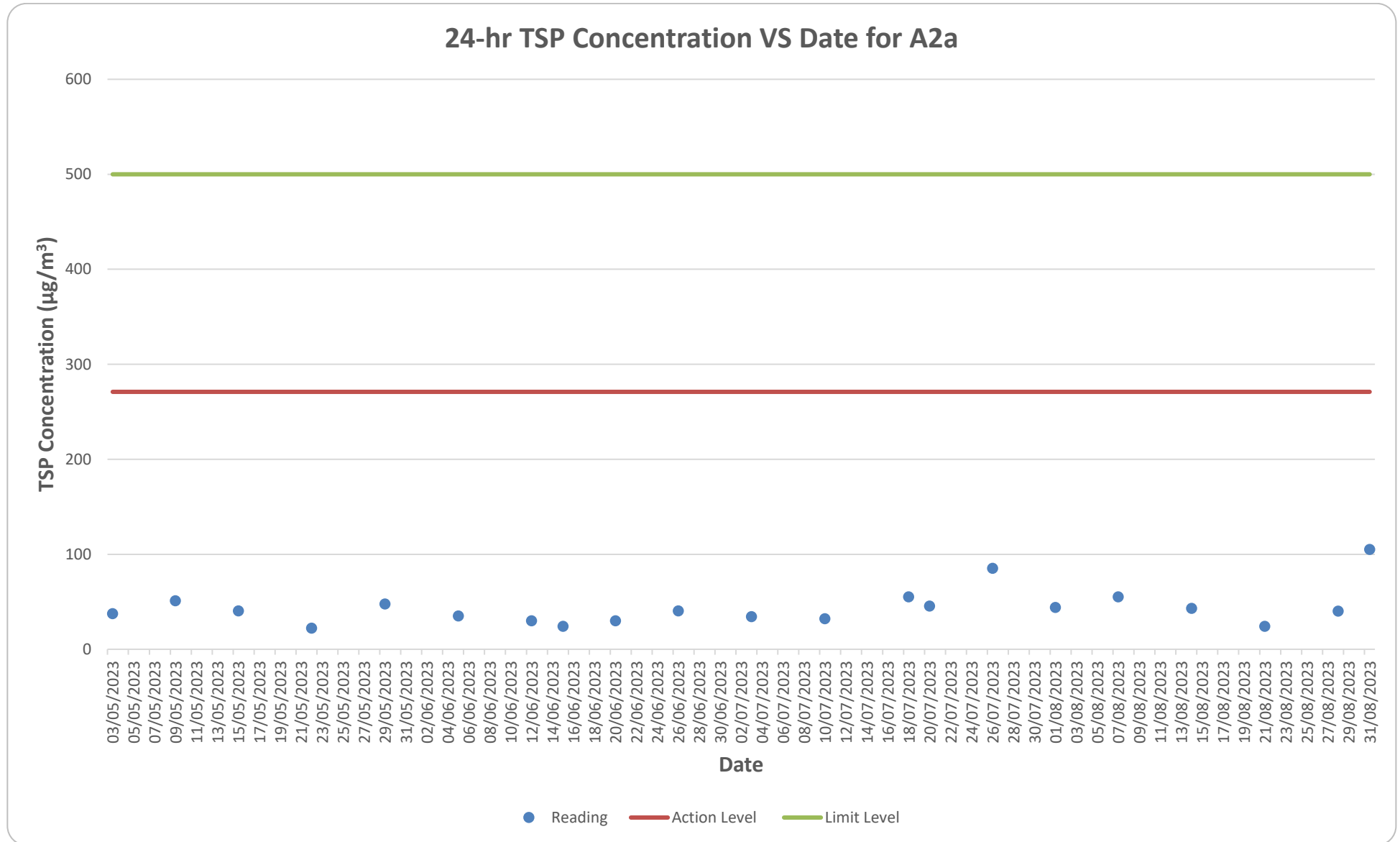


Figure D.4 Measured 24-Hour TSP at the existing outfall pumping station inside the construction site (A2a)



APPENDIX E

Calibration Certificates (Noise)



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SVAN 971 No. C119577

with preamplifier SVANTEK type SV 18 No. C122487 and

with microphone ACO type 7052E No. 85197

1. CALIBRATION* (acoustical)

LEVEL METER function; Range: Low; Reference frequency: 1000Hz; Sound Pressure Level: 114.03 dB

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.03	114.05	0.02
A	114.03	114.05	0.02
C	114.03	114.05	0.02

Calibration measured with the microphone ACO type 7052E No. 85197. Calibration factor: 0.74 dB.

2. LINEARITY TEST* (electrical)

LEVEL METER function; Range: Low; Characteristic: A; $f_{sin} = 31.5$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	83.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A; $f_{sin} = 1000$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	123.0
Error [dB]	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A; $f_{sin} = 8000$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	122.0
Error [dB]	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{sin} = 31.5$ Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{sin} = 1000$ Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	-0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{sin} = 8000$ Hz

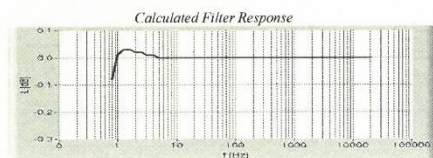
Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.0	0.0

1/3 OCTAVE (1kHz); Range: Low; $f_{sin} = 1000$ Hz

Nominal result [dB]	25.0	30.0	40.0	60.0	80.0	100.0	120.0	123.0
Error [dB]	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

4. FREQUENCY RESPONSE* (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal =120 dB;



Measured Filter Response with Preamplifier SV18
 (f-frequency, L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	0.0	4000	0.0
12.5	-0.0	125	0.0	8000	0.0
16	0.0	250	0.0	16000	0.0
20	0.0	500	0.0	20000	0.0
25	0.0	1000	0.0		
31.5	0.0	2000	0.0		

All frequencies are nominal center values for the 1/3 octave bands

5. INTERNAL NOISE LEVEL* (electrical - compensated)

LEVEL METER function; Range: Low; (Back-light – off); Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤20	≤12	≤12

* measured with preamplifier SVANTEK type SV 18 No. C122487.

6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A; (Backlight – off)

Range	Low	High
Indication [dB]	≤15	20.5

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
23 °C	42%	1008 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV33B	93171	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Cezary Dardziński



Test date: 2022-10-11



CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR
Type : NC-75
Serial number : 35124528
Manufacturer : RION CO., LTD.
Calibration quantities : Sound pressure level (with reference standard microphone)
Calibration method : Measured by specified secondary standard microphone
according to JCSS calibration procedure specified by RION.
Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,
Static pressure 100.6 kPa
Calibration date : 02/11/2022 (DD/MM/YYYY)
Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 09/11/2022 (DD/MM/YYYY)

Junichi Kawamura
Manager
Quality Assurance Section,
Quality Assurance Department,
Environmental Instrument Division,
RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IA Japan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.



CALIBRATION RESULT

1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160
 Serial number : 2973341
 Reference Sound pressure : 2×10^{-5} Pa

*1 Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

BE OUT OF JCSS CALIBRATION

1. Frequency

Measured value	Measurement uncertainty ($k=2$)
1000.0 Hz	2.7×10^{-4} Hz

Working measurement standard universal counter:

Type : 53132A
 Serial number : MY40005574
 (JCSS Calibration Certificate No. 2208001889940)

2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A
 Serial number : 11076061
 (A2LA Calibration Certificate No. 1502-03109)

- closing -



APPENDIX F

Monitoring Data (Noise)

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Location: N2a

Monitoring Period: August 2023

Parameter: Noise

Major Noise Source: Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	L _{eq}	L ₁₀	L ₉₀
2/8/2023	Sunny	15:30	67.3	69.4	62.2
8/8/2023	Sunny	14:55	71.9	75.1	63.9
15/8/2023	Cloudy	14:28	68.4	70.9	64.5
22/8/2023	Sunny	14:58	73.4	75.6	69.6
29/8/2023	Sunny	14:45	74.0	77.3	66.9
Average			71.7		
Range			67.3 – 74.0		

Location: N3a
Monitoring Period: August 2023
Parameter: Noise
Major Noise Source: Construction activities and daily operation of the sewerage treatment plant
Other Factors NA

Date	Weather	Start Time	L _{eq}	L ₁₀	L ₉₀
2/8/2023	Sunny	13:48	72.3	74.7	55.1
8/8/2023	Sunny	13:28	71.2	74.4	55.6
15/8/2023	Cloudy	13:10	74.3	77.6	55.2
22/8/2023	Sunny	13:01	74.4	78.9	54.0
29/8/2023	Sunny	13:00	71.2	73.6	53.3
Average			73.0		
Range			71.2 – 74.4		

Remarks: +3 dB(A) free-field corrections have been made to N3a.

Figure F.1 Measured daytime (0700-1900) noise level at the admin building inside the construction site (N2a)

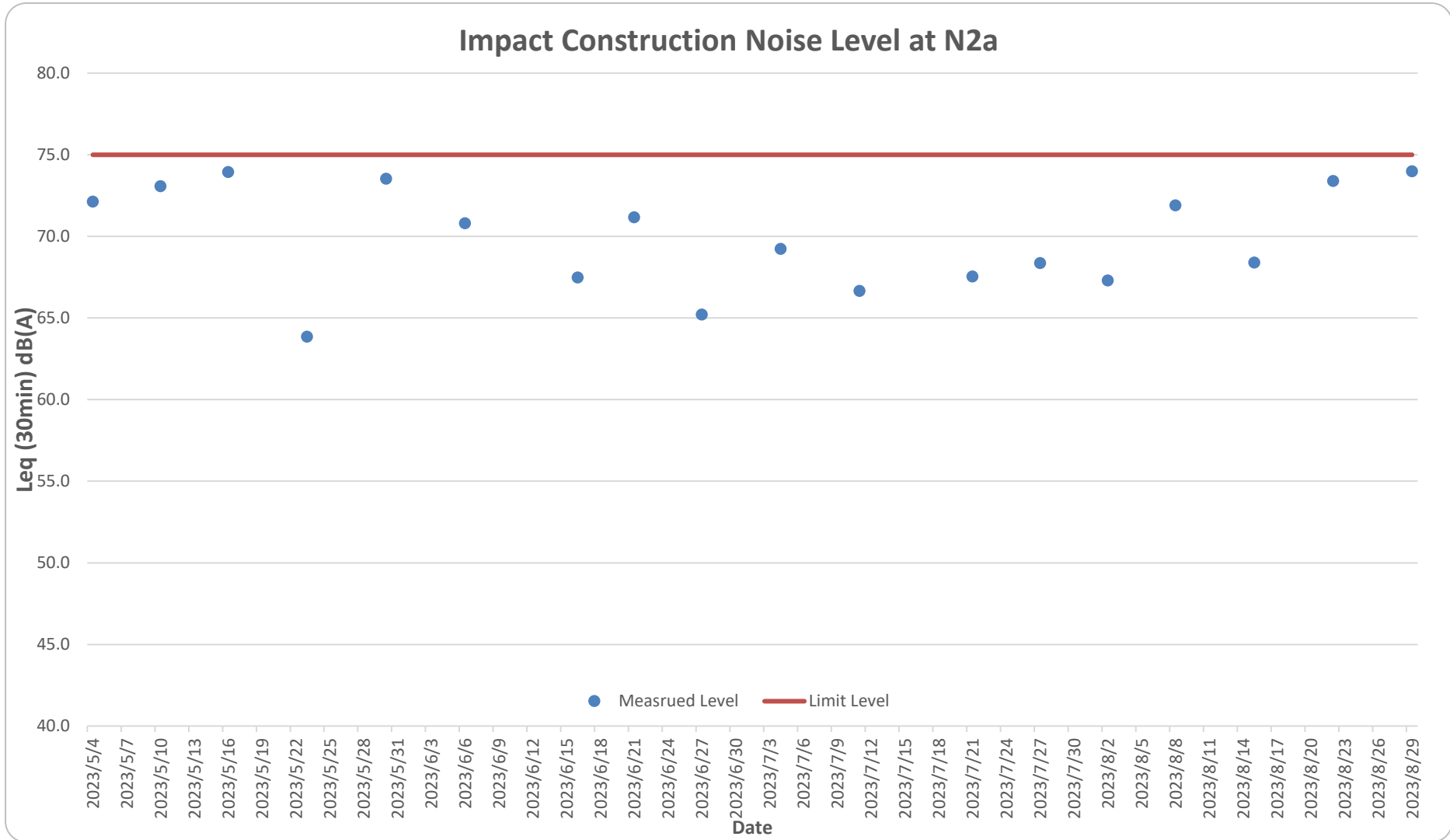
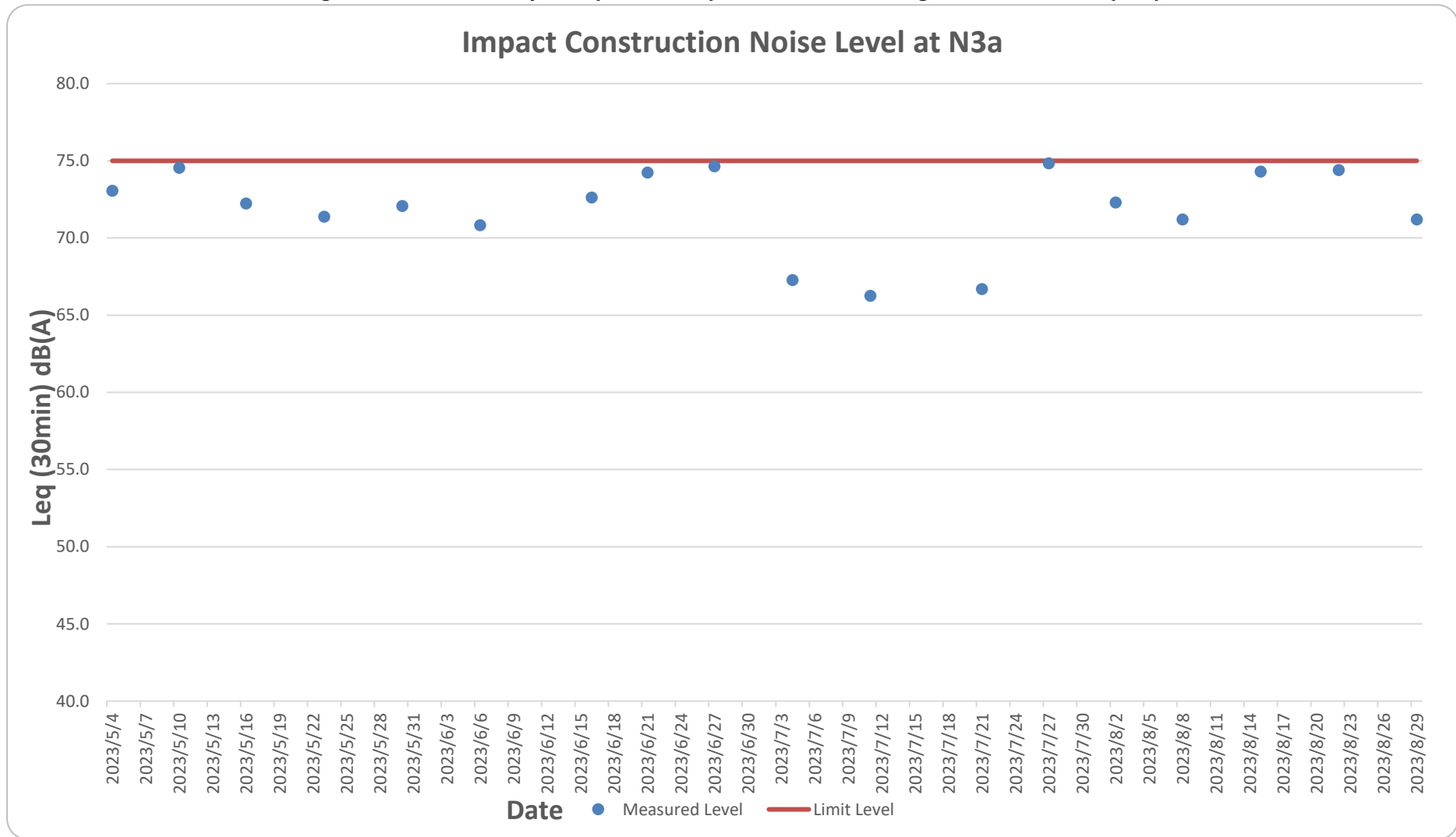


Figure F.2 Measured daytime (0700-1900) noise level at Cheung Chau Fire Station (N3a)



s: +3 dB(A) free-field corrections have been made to the data in the graph.

APPENDIX G

Implementation Schedule

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component))							
S.3.5.5	<p>Appropriate dust control measures should be implemented during the construction stage in accordance with the requirements in the Air Pollution Control (Construction Dust) Regulation. Dust control techniques should be considered to control dust to a level not exceeding the AQOs as well as the 1-hour TSP guideline level of 500 µg/m³. These measures include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Adoption of good site practices; • Avoid practices likely to raise dust level; • Frequent cleaning and damping down of stockpiles and dusty areas of the site; • Covering the exposed areas with tarpaulin; • Reducing drop height during material handling; • Provision of wheel-washing facilities for site vehicles leaving the site; • Regular plant maintenance to minimize exhaust emission; and • Sweep up dust and debris at the end of each shift. 	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	All the dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, should be implemented. Typical dust control measures include:	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

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EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Watering every 1.5 hours on active works areas and paved haul roads to reduce dust emissions by 90.9% (e.g. watering intensity at 0.5 litres/m ² . Actual application shall depend on the site condition and weather conditions).	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		EIA, Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Watering every hour on unpaved areas and stockpiles of dusty materials (if no tarpaulin is provided) to reduce dust emissions by 90% (e.g. watering intensity at 1.5 litre/m ² during the first hour, subsequent application at 0.2 litre/m ² . Actual application shall depend on the site condition and weather conditions).	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		EIA, Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Use of frequent watering for particularly dusty construction areas and areas close to ASRs	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Vehicle washing facilities should be provided at every vehicle exit point	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Stockpiles of imported material kept on site shall be contained within hoarding, dampened and/or covered during dry and windy weather	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Material stockpiled alongside trenches should be covered with tarpaulins	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet during the non-working hours	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to keep the dusty materials wet	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Water sprays shall be used during the delivery and handling of sands aggregates and the like	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	All demolished items that may emit dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	<p><u>Good site practices for concrete batching plant</u></p> <p>Every stock of more than 20 bags of cement or dry pulverized fuel ash(PFA) should be cover entirely by impervious sheeting or placed in an area sheltered on the top and the sides.</p> <p>Cement or dry PFA delivered in bulk should stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed.</p> <p>Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with effective fabric filter or equivalent air pollution control system (Maximum TSP emission factor of Silos and Mising Tower: 50mg/m³)</p>	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		<p>Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation</p> <p>Best Practical Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</p>

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EIA Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component))					
S.4.4.12	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Mobile plant should be sited as far away from NSRs as possible.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Material stockpiles and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements

EIA Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.4.4.13	Use of quiet plant (PME): <ul style="list-style-type: none"> • Generator • Poker, vibratory, hand-held • Breaker, excavator mounted (hydraulic) • Excavator • Tracked Mobile Crane • Vibratory Compactor • Dumper • Air compressor • Concrete Pump • Piling Rig 	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.14	Temporary site hoardings of 2.4 m high are recommended for the works at the Pak She SPS. The hoardings will be erected along the works boundary facing the NSRs. The PME involved in the works would be screened by the erected site hoardings. Without direct line of sight from the affected NSRs, a noise reduction of 10 dB(A) could be achieved provided that the hoardings have no openings or gaps and have a surface mass of at least 7 kg/m ² . Nonetheless, a -5 dB(A) screening correction for site hoardings has been applied as a more conservative approach.	Noise control during construction	Contractors	At Pak She SPS during the entire construction period	EIA
S.4.4.23	For NSRs which would be affected by more than one Works Types, good scheduling works is recommended to minimize the cumulative construction noise impacts due to different Works Types.	Noise control during construction	Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements

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S.4.4.29	In order to prevent potential cumulative construction noise impacts to NSRs, the works at Tai Kwai Wan San Tsuen are recommended to be scheduled to avoid concurrent works at the areas near Tai Kwai Wan of the Improvement of Fresh Water Supply to Cheung Chau project.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements
S.4.4.30	The contractor shall liaise with “Replacement and Rehabilitation of Water Mains Stage 4, Mains on Hong Kong and Islands – Investigation, Design and Construction” contractors so as to avoid undertaking works concurrently with the works when they are in the close proximity as far as practicable.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements
S.4.4.31	The contractor shall liaise with Improvement to Existing Roads and Drains in Cheung Chau Old Town, Remaining Engineering Works Stage 3 works contractors so as to avoid undertaking works concurrently with the works when they are in the close proximity as far as practicable.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component) and Sewers Works (non-DP Component))							
S.5.7.1	<p>Practices outlined in ProPECC PN 1/94 Construction Site Drainage are recommended, as highlighted below:</p> <ul style="list-style-type: none"> Perimeter channels are to be installed in works areas to intercept runoff at the site boundary prior to the commencement of any earthworks. Surface runoff should be discharged into storm drains via sand/ silt removal facilities with an adequate capacity; Works programme should be designed to minimize works areas to reduce soil exposure and site runoff; Silt removal facilities, channels and manholes should be maintained and cleaned regularly to ensure their proper functions; Works programme should be carefully planned to minimize the scale of soil excavation during the rainy season; Earthworks surfaces should be well compacted and subsequent permanent works or surface protection measures should be carried out immediately; All vehicles should be washed before they leave the construction site to avoid earth, mud, and debris being carried off from the site. Wash-water should be treated to remove sand and silt at least on a weekly basis to ensure the continued efficiency of the washing facility; 	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> WPCO; TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
(cont...)	<ul style="list-style-type: none"> Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric materials during storms; For sections of pipes that need to be laid underneath water courses with the open cut method, site works should be carried out during the dry season with a temporary drainage diversion; and; Any construction works along Hak Pai Road immediately by the Kwun Yam beach and Cheung Chau Tung Wan beach should be avoided during the swimming season. 	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> WPCO; TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water
S.5.7.2 and S.5.7.3	<p>Mitigations Measures for General Construction Activities:</p> <ul style="list-style-type: none"> Good site practices should be adopted to regularly clean the construction sites to avoid rubbish, debris and litter from entering to nearby water bodies; and Good construction and site management practices should be implemented to ensure that litter, fuels, and solvents would not enter the public drainage systems. 	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> WPCO; TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.5.7.4	Domestic sewage generated by workforce would be collected and discharged to the STW for proper treatment. Portable toilets should be provided by the Contractor, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal.	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> • WPCO; • TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water
S.5.7.5 and S.5.7.6	Mitigations Measures for Spillage of Chemicals: <ul style="list-style-type: none"> • Registration to EPD as a Chemical Waste Producer if chemical wastes are generated and need to be disposed of; • Illegal disposal of chemicals should be strictly prohibited; and • Oils and fuels should only be used and stored in the designated area which has polluting prevention facilities. 	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> • WPCO; • TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water

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EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component) and Sewers Works (non-DP Component))							
S.6.6.1	The Contractor shall prepare a Waste Management Plan in accordance with the requirements set out in the ETWB TCW No. 19/2005, Waste Management on Construction Site, for the ER's approval. The WMP shall include monthly and yearly Waste Flow Tables that indicate the amounts of waste generated, recycled and disposed of (including final disposal site).	Waste management during construction	Contractors		√		ETWB TCW No. 19/2005, Waste Management on Construction Sites
S.6.6.1	The Contractor's waste management practices and effectiveness shall be audited by the Engineer's Representative on regular basis.	Waste management during construction	DSD		√		Waste Disposal Ordinance
S.6.6.1	The Contractor shall provide training for site staff concept of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Sufficient waste disposal points and regular collection of waste shall be provided.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Trucks with covering for the open-box bed and enclosed container shall be used to minimise windblown litter and dust during transportation of waste.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Regular cleaning and maintenance programme for drainage systems, pumps and oil interceptors.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.1	Separation of chemical wastes for special handling and appropriate treatment at a Chemical Waste Treatment Facility (CWTF).	Waste management during construction	Contractors		√		Waste Disposal (Chemical Waste) (General) Regulation
S.6.6.1	Encourage collection of aluminium cans, paper and plastic bottles by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the workforce.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	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.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Plan and stock construction materials to minimise amount of waste generated and avoid unnecessary generation of waste.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.2	Alternatives C&D materials such as steel frameworks and plastic fencing can be considered to increase the chances for reuse.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.3	In order to minimise the potential environmental impacts resulting from collection and transportation of C&D materials for off-site disposal, the excavated materials comprising fill materials should be reused on-site as backfilling materials as far as practicable.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.4	C&D waste, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill sites. A suitable area should be designated within the site for temporary stockpiling of C&D materials and to facilitate the sorting process. In order to monitor the disposal of C&D materials at the designated public fill reception facility and landfill and to control fly-tipping, a trip ticket system should be included. Reference can be made to Development Bureau Technical Circular (Works) (TC(W)) No. 6/2010 for details.	Waste management during construction	Contractors		√		Development Bureau Technical Circular (Works) (TC(W)) No. 6/2010, Waste Disposal Ordinance
S.6.6.5	The C&D materials to be disposed of at public filling reception facilities shall be only materials consist of brick, concrete, cement plaster, soil and inert building debris. The materials shall be free from plastics, chemical waste, industrial metals and other materials that are considered unsuitable at the facility.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.6	General refuse should be stored in enclosed bins or compaction units separate from C&D materials. A reputable waste collector should be employed by the contractor to remove general refuse from the site regularly, separately from C&D materials. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light materials. In addition, a sufficient number of enclosed bins shall be provided on site for containment of general refuse to prevent visual impacts and nuisance to the sensitive surrounding.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.7	For the disposal of chemical wastes produced at the construction site, the Contractor is required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used. Appropriate labels should be securely attached on each chemical waste container indicating the chemical characteristics of the chemical waste, such as explosives, flammable oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall also use a licensed waste collector engaged to transport and dispose of the chemical wastes in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Waste management during construction	Contractors		√		Waste Disposal (Chemical Waste) (General) Regulation
S.6.6.8	Chemical toilets to be provided on-site shall be regularly cleaned and the night-soil collected and transported by a licensed contractor to a Government Sewage Treatment Works facility for disposal.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Construction Phase (Upgrading Works of Cheung Chau STW (DP Component))							
Table 11.8	Visual Screen/Hoarding Decorative hoarding or boundary fence for construction sites shall be considered, and designed to be compatible to the surroundings.	To minimise the potential visual impacts	Contractors		√		N/A

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	<p>Protection to Existing Trees within Works Areas</p> <p>All existing trees which are not in direct conflict with the proposed works will be retained. The existing trees proposed to be retained shall be properly maintained and protected by means of fencing to prevent vehicular or pedestrian intrusion that may potentially damage tree canopies, trunks and root zones. Detailed tree protection specifications shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and tree monitoring system. For trees with high preservation value, individual tree assessments and continuous tree monitoring reports shall be provided by a certified Arborist, Landscape Architect or related professional during construction. All retained trees shall be recorded photographically at the commencement of contract.</p> <p>Root pruning to the retained trees should be prohibited. Retained trees should be well-preserved by setting up a tree protection zone throughout the construction period for protecting the retained trees from damages.</p> <p>To maximize protection to existing trees and ground vegetation, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should close monitor and restrict the site working staff not to enter the “no-intrusion zone”, even for non-direct construction activities and storage of equipment.</p>	Landscape mitigation measures	DSD and Contractors	√	√		EIA, Annex 10 and Annex 18 of EIAO-TM

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	<p>Tree Transplanting</p> <p>Existing trees to be affected shall be directly transplanted to the proposed tree receiving sites, or to temporary tree nurseries alternatively. Temporary tree nurseries may be set up for the transplanted tree and proposed trees at an early stage to allow small trees to grow during the construction stage. By the time when planting area becomes available, trees have been mature and required minimal pruning and suffer much less damage during transplanting. The construction programme should also allow sufficient time for root pruning and root ball preparation prior to transplanting, if necessary, and transplanting operations to be carried out in planting season.</p> <p>Tree pruning such as topping, lion tailing would be prohibited as far as possible. Also, frequent keep watering would be necessary for transplanting trees. The proposed tree preservation measures during construction would be carried out and approved by the competent persons.</p>	Landscape mitigation measures	DSD and Contractors	√	√		EIA, Annex 10 and Annex 18 of EIAO-TM
Table 11.8	<p>Construction Light</p> <p>Security floodlight for construction areas shall be controlled, such as equipped with adjustable shield, frosted diffusers and reflective covers, at night to avoid excessive glare to the nearby areas and residents. Other security measures shall also be considered to minimize the visual impacts by construction light.</p>	To reduce the night-time glare effect to the surrounding environs.	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM

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EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	Dust and Erosion Control for Exposed Soil Excavation works and demolition of existing building blocks shall be well planned with precautions to suppress dust. Exposed soil shall be covered or watered often. Areas that are expected to be left with bare soil for a long period of time after excavation shall be properly covered with suitable protective fabric. Suitable drainage shall be provided around construction sites to avoid discharge of contaminants and sediments into sensitive water-based habitats.	To minimise the disturbance to existing landscape resources and minimise the impacts on the visual amenity of the area	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM
Table 11.8	Reinstatement of Works Areas The affected works areas shall be properly reinstated to the satisfaction of relevant government departments.	Landscape mitigation measures	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM

APPENDIX H

Summary of All Complaints Received, Notification of Summons and Successful Prosecutions

Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaints Statistics		
	Frequency	Nature	Follow-up Actions
1 August 2023 - 31 August 2023	0	N/A	N/A
Cumulative	0	N/A	N/A

Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Nature	Follow-up Actions
1 August 2023 - 31 August 2023	0	N/A	N/A
Cumulative	0	N/A	N/A

Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Nature	Follow-up Actions
1 August 2023 - 31 August 2023	0	N/A	N/A
Cumulative	0	N/A	N/A

APPENDIX I

EM&A Monitoring Schedules in the Reporting Period and the Next Reporting Period (Tentative)

Impact Monitoring Schedule for Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities						
Aug-23						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a			
6	7	8	9	10	11	12
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
13	14	15	16	17	18	19
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
20	21	22	23	24	25	26
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
27	28	29	30	31		
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a		
Remarks: 1. Daytime Noise Monitoring (07:00-1900)						

Impact Monitoring Schedule for Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities						
Sep-23						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a		
3			24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a		
10		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a			
17	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
24	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
Remarks: 1. Daytime Noise Monitoring (07:00-1900)						