Sun Fook Kong – Bestwise Joint Venture

Contract No. DC/2009/10 HATS Stage 2A – Upgrading Works at Stonecutters Island Sewage Treatment Works - Main Pumping Station, Sedimentation Tanks and Ancillary Facilities

Monthly Environmental Monitoring and Audit Report July 2019

(Version 1.0)

Certified By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

Wellab accepts no responsibility for changes made to this report by third parties

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Our Reference
EC/AFK/DC/rh/T261332/
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Contract No. DC/2009/10 – Upgrading Works at Stonecutters Island Sewage Treatment Works – Main Pumping Station, Sedimentation Tanks and Ancillary Facilities

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Condition 4.4 – Monthly EM&A Report for July 2019 (no. 100) Version 1.0

14 August 2019

By Post

Dear Sir,

I refer to the captioned Monthly EM&A Report for July 2019 (version 1.0) submitted by ET on 9 August 2019 via email. In accordance with Condition 4.4 of Environmental Permit No. EP-322/2008/G, I hereby verify the captioned Monthly EM&A Report.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

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Sun Fook Kong – Bestwise Joint Venture	Mr. Keith Ho	By email
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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
DSD	Drainage Services Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan
SCISTW	Stonecutters Island Sewage Treatment Works
HATS Stage 2A	Harbour Area Treatment Scheme Stage 2A
SBJV	Sun Fook Kong - Bestwise Joint Venture

EXECUTIVE SUMMARY

Introduction

1. This is the 100th Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Wellab Limited for DSD Contract No. DC/2009/10 "HATS Stage 2A – Upgrading Works at Stonecutters Island Treatment Works – Main Pumping Station, Sedimentation Tanks and Ancillary Facilities" (The Project) which documents the key information of EM&A and environmental monitoring works undertaken by other Contracts at the SCISTW under HATS Stage 2A with the same Environmental Permit (Permit No. EP-322/2008/G).

2. The site activities undertaken in the reporting month included:

Riser Shaft
- Hack off C.J. and erect slab formwork for Riser Shaft Top Slab
- Concrete surround for DN600 centrate pipe and air vents is completed

External Works
- Construction of paving block road near DOU2 and Car Park Cover
- Construction of concrete pavement near CMB

MPS2
- Construction of standing platform for site visit

Environmental Monitoring Works

3. The environmental monitoring works of the Project were conducted by the ETs for Contract DC/2009/10, at the SCISTW under HATS 2A with the same Environmental Permit. The monitoring results were checked and reviewed and the site audits were conducted once per week. The implementation of the Environmental Mitigation Measures, Event Action Plans and Environmental Complaint Handling Procedures were also checked.

4. Summary of the non-compliance of the reporting month is tabulated in **Table I**.

Table I Summary Table for Non-compliance Recorded in the Reporting Month

Monitored By	Monitoring Station	Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
			Action Level	Limit Level	Action Level	Limit Level	
DC/2009/10	AM6a	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A
	NM5	Noise	0	0	0	0	N/A
	NM6	Noise	0	0	0	0	N/A
	AM7	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A
	AM8	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A

1-hour TSP Monitoring

5. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

6. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise

7. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Licenses and Permits

8. Licenses/Permits granted to the Project include the Environmental Permit (EP); Billing account for Disposal of Construction Waste, Registered as Chemical Waste Producer and Construction Noise Permits.

Environmental Mitigation Implementation Schedule

9. According to the EIA Report Section 3.74, 4.56 and 13.44, air quality, noise and landscape and visual would be the key environmental issues and mitigation measures shall be implemented during the construction phase. Details of the implementation of mitigation measures are provided in the **Appendix J.**

Key Information in the Reporting Month

10. Summary of key information in the reporting month is tabulated in **Table II**.

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Status of submissions under EP	1	Monthly EM&A Report for June 2019	Submitted on 15 July 2019	No Comment	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

Summary of Complaints and Prosecutions

11. No environmental complaint and prosecution was received for the Project in the reporting month.

12. There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix K.**

Future Key Issues:

13. Major site activities for the coming two months include:

Section 5 – (External works)
- Roadworks and CLP trench modification
- Landscaping works

MPS2
- FSI re-inspection and hot smoke test
- Pre-handover inspection for FS, MVAC and Process Water System
- Demonstration for operation of large KGV, Air-scouring system, Sparging & drainage system
- Main pump upgrading (after FSI re-inspection)
- RT for Chemical Dosing System (Cooling Water System)
- 2nd and 3rd session of Training
- Defect rectification
- Handover of MPS2

CEPT Tank
- Pre-handover inspection for northern PST (#47/49, #51/53) and FT5
- RT for FT5 (FMM/SMM)
- Maintenance works & Pre-handover inspection for southern PST (#48/50, #52/54) and FT6
- RT for FT6 (FMM/SMM)
- RT for Process Water & Protected Water System
- 2nd and 3rd session of Training

DOU3
- Upgrading 1st and 2nd BTF vessel and associated equipment.

Riser Shaft
- Construction of Top Slab for Riser Shaft

14. The environmental concerns in the coming months are mainly on chemicals and general refuse storage, surface runoff generated during rainstorm and wheel washing; dust control and treatment of wastewater generated from the construction works.

1. INTRODUCTION

Background

1.1 The Project 'HATS Stage 2A - Upgrading works at Stonecutters Island Treatment Works (SCISTW) – Main Pumping Station, Sedimentation Tanks and Ancillary Facilities' under Contract No: DC/2009/10 mainly comprises the construction of a large underground pumping station with an internal diameter of 55 metres and a depth of more than 40 metres, the provision of additional double-tray sedimentation tanks, a new computer control system, the expansion and modification of existing installations of the SCISTW as well as the construction of other ancillary facilities. The general location plan of the Project is shown in **Figure 1**.

1.2 The Project is under Harbour Area Treatment Scheme (HATS) Stage 2A and is a designated project with Register No. : AEIAR-121/2008. The current works under the Project at SCISTW for HATS 2A are covered by the Environmental Permit (Permit No. EP-322/2008/G), which was issued on 9th May 2014 by the Environmental Protection Department (hereinafter called EPD) to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder.

1.3 Sun Fook Kong -Bestwise Joint Venture (hereafter called the SBJV) was commissioned by the DSD to undertake the construction of the Contract No. DC/2009/10 "HATS 2A –Upgrading works at Stonecutters Island Treatment Works – Main Pumping, Sedimentation Tanks and Ancillary Facilities". The date of commencement of construction of the Project is 24th February 2011.

1.4 Wellab Limited was commissioned by SBJV to undertake the Environmental Monitoring and Audit (EM&A) works for the project and was appointed as the Environmental Team (ET) of the Project under Condition 2.1 of the EP. The date of commencement of EM&A works is 14th April 2011. The Project cover the environmental monitoring works at monitoring stations AM6a, AM7, AM8, NM5 and NM6.

1.5 This is the 100th monthly EM&A report summarizing the EM&A works conducted for the Project in July 2019.

Project Organizations

1.6 The contacts of the Project are shown in **Table 1.1** and the organization chart of ET for Contract is shown in **Figure 2**.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.
Ove Arup & Partners Hong Kong Ltd	Engineer's Representative	Mr. Ted Tang	Principal Resident Engineer	2370 4311
	Coordinator	Ms. Natalie Kwok	Resident Engineer	6794 8844
Wellab	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089
		Mr. Jonathan Lee	Project Coordinator & Audit Team	2151 2035
		Mr. C.M. Li		2151 2073

Party	Role	Name	Position	Phone No.
Mott MacDonald	Independent Environmental Checker	Dr. Anne Kerr	Independent Environmental Checker	2828 5757
Sun Fook Kong - Bestwise Joint Venture	Contractor	Mr. Keith Ho	Site Agent	2620 0070
		Mr. Leo Leung	Environmental Officer	2620 0070

Summary of EM&A Requirements

1.7 The EM&A programme requires construction phase monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.8 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.

1.9 This report presents the monitoring results, observations, locations, equipment, period, for required monitoring parameter namely air quality, noise and audit works conducted for the Project in July 2019.

2. AIR QUALITY

Monitoring Requirements

2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

2.2 Three designated monitoring stations, AM6a, AM7 and AM8 were selected for impact dust monitoring for the Project. The pervious location of AM6 was inaccessible due to planned construction works and therefore an alternative monitoring station AM6a was proposed and adopted for subsequent impact monitoring starting on 4th January 2016. **Table 2.1** describes the air quality monitoring locations, which are also depicted in **Figure 1**.

Table 2.1 Locations for Air Quality Monitoring

Monitoring Station	Monitored by	Location of Measurement
AM6a	DC/2009/10	Works site boundary
AM7		North West Kowloon Sewage Pumping Station
AM8		Block A of Government Dockyard

Monitoring Equipment

2.3 **Table 2.2** summarizes the air quality monitoring equipment and **Appendix B** shows the copies of calibration certificates for the equipment at AM6a, AM7 and AM8.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
Laser Dust Monitor	Met One Instruments no. AEROCET-831	3
HVS Sampler	TISCH: Model no. TE-5170	3
Calibrator	TISCH: Model TE-5025A	1

Monitoring Parameters, Frequency and Duration

2.4 **Table 2.3** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for AM6a, AM7 and AM8 are shown in **Appendix C.**

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Period	Frequency
All monitoring locations	1-hour TSP	0700-1900 hrs	3 times/ every 6 days
	24-hour TSP	0000-2400 hrs	once in every 6 days

Monitoring Methodology and QA/QC Procedure

2.5 The monitoring methodology and QA/QC procedures for monitoring station AM6a, AM7 and AM8 are presented as follow:

2.6 The general weather conditions (i.e. sunny, cloudy or rainy) were recorded by the field staff's observation on the monitoring day.

TSP Monitoring with Laser Dust Monitor

Measuring Procedures

2.7 The measuring procedures of the 1-hour dust meters were in accordance with the Manufacturer's Instruction Manual as follows:

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Remove the red rubber cap from the AEROCET-831 inlet nozzle.
- Turn on the power switch that is located on the right side of the AEROCET-831.
- On power up the product intro screen is displayed for 3 seconds. The intro screen displays the product name and firmware version.
- Then the main counter screen will be displayed.
- Press the START button. Internal vacuum pump start running. After 1 minute the pump will stop and the 0.5µm and 5µm channels will show the cumulative counts of particles larger than 0.5µm and 5µm per cubic foot.
- The AEROCET-831 is now checked out and ready for use.
- To switch off the AEROCET-831 power to stop the measuring after 1 hour sampling.
- Information such as sampling date, time, and display value and site condition were recorded during the monitoring period.

Maintenance/Calibration

2.8 The following maintenance/calibration was required for the direct dust meters:

- Check the meter at a 3-month interval and calibrate the meter at a 1-year interval throughout all stages of the air quality monitoring.

TSP Monitoring with High Volume Sampler

Instrumentation

2.9 High Volume Sampler (HVS) completed with appropriate sampling inlets was employed for air quality monitoring. Each sampler comprised of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

HVS Installation

2.10 The following guidelines were adopted during the installation of HVS:

- Sufficient support was provided to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured

horizontally was required.
- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.
- The samplers were more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

Filters Preparation

2.11 Fibre glass filters, which have a collection efficiency of larger than 99% of particles of 0.3 μm in diameter, were used. A HOKLAS accredited laboratory, Wellab Ltd., was responsible for the preparation of 24-hr conditioned and pre-weighed filter papers for Wellab's monitoring team.

2.12 All filters, which were prepared by Wellab Ltd., were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%.

2.13 Wellab Ltd. has a comprehensive quality assurance and quality control programme.

Operating/Analytical Procedures

2.14 Operating/analytical procedures for the air quality monitoring were highlighted as follows:

- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air quality monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centred with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and secured with the aluminium strip.
- The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- After sampling, the filter was removed and sent to the Wellab Ltd. for weighing. The elapsed time was also recorded.
- Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%. Weighing results were returned to Wellab for further analysis of TSP concentrations collected

by each filter.

Maintenance/Calibration

2.15 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.

Results and Observations

2.16 **Table 2.4** summarizes the monitoring results at AM6a, AM7 and AM8 in the reporting month.

Table 2.4 Summary of 1-hour and 24-hour TSP Monitoring Result in the Reporting Month

Air Quality Monitoring Station	Average µg/m³	Range µg/m³	Action Level µg/m³	Limit Level µg/m³
1 hour TSP				
AM6a	39	8 – 93	346	500
AM7	98.2	65.5 – 160	322	
AM8	73.5	36.4 – 159.2	307	
24 hours TSP				
AM6a	33	16 – 65	196	260
AM7	94	57 – 181	207	
AM8	32	14 – 64	158	

2.17 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix F.**

2.18 All 24-hr TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix F.**

2.19 The details and graphical presentations of the air quality monitoring results at AM6a, AM7 and AM8 are shown in **Appendix D**.

2.20 According to field observations during site inspection, the identified dust sources at the monitoring stations were mainly from loadings of material, vehicles movement of this Contract in the site.

3. NOISE

Monitoring Requirements

3.1 Two noise monitoring stations, namely NM5 and NM6 was designated in the EM&A Manual for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

3.2 Monitoring station (NM6) serves as an alternative location for FSD Diving Rescue and Diving Training Centre which is regarded as a Noise Sensitive Receiver (NSR) as it is an institution. Monitoring station (NM6) was set up at the proposed location in accordance with the Monitoring Proposal submitted by ET of Contract DC/2009/05, as agreed by the ER and IEC.

Monitoring Locations

3.3 Noise monitoring was conducted at two designated monitoring stations as listed in **Table 3.1.**

Table 3.1 Location of Noise Monitoring Stations

Monitoring Station	Monitored By	Location of Measurement
NM5	DC/2009/10	Near FSD Diving Rescue and Training Centre
NM6		Customs' Marine Base (Block H of Government Dockyard Rooftop)

Monitoring Equipment

3.4 **Table 3.2** summarizes the noise quality monitoring equipment and **Appendix B** shows the copies of calibration certificates for the equipment used at NM5 and NM6 in the reporting month.

Table 3.2 Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVANTEK, Model no: SVAN 957 BSWA, Model no: BSWA 801	2
Calibrator	SVANTEK, Model no: SV 30A Bruel & Kjaer, Model No. 4231	2

Monitoring Parameters, Frequency and Duration

3.5 **Table 3.3** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule of the reporting month for NM5 and NM6 is shown in **Appendix C**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency
NM5 NM6	L_{eq}(30 min.) dB(A)	0700-1900 hrs. on weekdays	Once per week
	L_{eq}(5 min.) dB(A)	During restricted hours	Monitoring to be conducted when construction works were to be carried out

Monitoring Methodology and QA/QC Procedures

3.6 The monitoring methodology and QA/QC procedure at NM5 and NM6 are presented as follow:

3.7 General weather conditions (i.e. sunny, cloudy or rainy) were recorded by field observation during equipment checking and estimated according to weather data from the Hong Kong Observatory.

Field Monitoring

3.8 The monitoring procedures are as follows:

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels were adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:

  - Frequency weighting : A
  - Time weighting : Fast
  - Measurement time : 30 minutes

- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
- Noise monitoring was carried out 30 minutes during on the monitoring days. Monitoring data was recorded and stored automatically within the sound level meter system. At the end of the monitoring period, noise levels in term of L_{eq}, L_{90} and L_{10} were recorded.
- All the monitoring data within the sound level meter system was downloaded through the computer software, and all these data was checked and reviewed within the computer.

Maintenance and Calibration

3.9 Maintenance and Calibration procedures were as follows:

- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- The sound level meter and calibrator were checked and calibrated at yearly intervals.

Results and Observations

3.10 **Table 3.4** summarizes the monitoring results at NM5 and NM6 in the reporting month.

Table 3.4 Summary the Noise Monitoring Results in Reporting Month

For the time period 0700-1900 hrs. on weekdays		
Noise Monitoring Station	Range, dB(A) L_{eq}(30 min.)	Limit Level dB(A)
NM5	61.4 – 69.2	75.0
NM6	62.4 – 68.4	75.0

3.11 The construction noise monitoring at the designated location was conducted by the ET of Contracts DC/2009/10 as scheduled in the reporting month. The monitoring results and graphical presentations could be referred to **Appendix E**.

3.12 1900-2300 hours noise monitoring was not conducted in the reporting month as there were no construction works during the period of restricted hours.

3.13 No Action/Limit Level exceedance was recorded in the reporting month. Summary of exceedance is presented in **Appendix F**.

3.14 The major noise sources identified at the designated noise monitoring stations were vehicle movement and construction equipment, as well as construction activities in Stonecutters Island STW.

4. ENVIRONMENTAL AUDIT

Site Audits

4.1 Site audits were conducted on a weekly basis to monitor the implementation of environmental management practices and mitigation measures at the site area by the Contractor.

4.2 Site inspections were undertaken to ensure and check that the implementation and maintenance of mitigation measures for Air Quality, Noise, Water Quality, Waste Management, Landscape and Visual are being properly carried out in the reporting month in accordance to section 14.1 of the EM&A Manual. No non-compliance was observed during the site inspections.

4.3 The summaries of site audits are attached in **Appendix G**.

Implementation Status of Environmental Mitigation Measures

4.4 Details of the implementation of mitigation measures are provided in the **Appendix J**.

4.5 During the weekly environmental site inspections in the reporting period, no non-conformance was identified. The observations of the site audit for the Projects are summarized in **Table 4.1**.

Table 4.1 Observations of Site Audit

Parameters	Ref. Number	Observations	Follow Up Action
Water Quality	190704-R01	Drainage gully inside the construction site should be covered.	The Roadwork was completed.
Air Quality	190718-R01	The road should be kept clean and free from dust.	The road was cleaned up and free from dust.
	190725-R01	Dusty material should be covered by impervious material.	Follow up action will be reported in the following monthly report.
Waste/ Chemical Management	190704-R02	Housekeeping in MPS2 should be improved.	MPS2 was cleaned up.
Landscape and Visual	N/A	There was no observation in the reporting month.	N/A
Noise	N/A	There was no observation in the reporting month.	N/A
Permit/ Licenses	N/A	There was no observation in the reporting month.	N/A

Review of Environmental Monitoring Procedures

4.6 The monitoring works conducted by Contract DC/2009/10's ET were reviewed at a regular basis to ensure the monitoring procedures were carried out properly.

Status of Environmental Licensing and Permitting

4.7 All permits/licenses obtained for the Contract DC/2009/10 are summarized in **Table 4.2**.

Table 4.2 Summary of Environmental Licence / Permit for DC/2009/10

Reference Number	Valid Period		Details	Status
	From	To		
Water Discharge License				
WT00023103-2015	19/1/2016	31/1/2021	The application was approved on 19-1-2016.	Valid
WT00024404-2016	19/5/2016	31/5/2021	The application was approved on 19-5-2016.	Valid
WT00025973-2016	22/11/2016	31/5/2021	The application was approved on 22/11/2016.	Valid
Registered Chemical Waste Producer				
WPN5213-269-3584-01	N/A	N/A	The application was approved on 4-5-2011.	Valid
Billing Account for Disposal of Construction Waste				
CSW01444	16/3/2011	N/A	The application was approved on 16-3-2011.	Valid
Notification of Works Under APCO				
327427	N/A	N/A	Notice form received by EPD on 2-3-2011.	N/A
Construction Noise Permit				
GW-RW0212-19	17/05/2019	09/11/2019	The application was approved on 14-5-2019.	Valid

Status of Waste Management

4.8 The amount of wastes generated by the activities of the Project in the reporting month is shown in **Appendix H**.

Implementation Status of Event Action Plans

4.9 The Event Action Plans for air quality and noise are presented in **Appendix I.**

1-hr TSP

4.10 No Action/Limit Level exceedance was recorded.

24-hr TSP

4.11 No Action/Limit Level exceedance was recorded.

Construction Noise

4.12 No Action/Limit Level exceedance was recorded.

Landscape and Visual

4.13 No major deficiency was recorded.

Summary of Complaints and Prosecutions

4.14 No environmental complaint and prosecution was received for the Project in the reporting month.

4.15 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix K**.

5. FUTURE KEY ISSUES

Key Issues for the Coming Month

5.1 Key environmental issues in the coming month include:

- Storage of chemicals/fuel and chemical waste/waste oil on-site;
- Drainage system should be well designed and maintained to prevent flooding and silty water from getting into the public area on rainy days;
- Leakage of oil from equipment;
- Generation of runoff during rainstorm;
- Dust generation should be mitigated by adequate water spraying, especially in dry days;
- Stockpile should be properly covered by tarpaulin to mitigate dust generation; and
- Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities.

Monitoring Schedule for the Next Month

5.2 The tentative environmental monitoring schedule over the next month is shown in **Appendix C** of this report.

Construction Program for the Next Month

5.3 The tentative construction program is provided in **Appendix L**.

6. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

6.1 Environmental monitoring and audit works were performed in the reporting month and all monitoring results were checked and reviewed.

1-hour TSP Monitoring

6.2 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

6.3 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

6.4 All Construction Noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Audit

6.5 Environmental site audits were conducted as weekly basis in the reporting month. No non-compliance was recorded.

Complaint and Prosecution

6.6 No environmental complaint and prosecution was received in the reporting month.

Recommendations for next reporting month

6.7 The following recommendations were made for the next report month:

Air Quality
- To provide adequate water spray on site;
- To mitigate dust generation by covering stockpile with tarpaulin;
- To regularly maintain the machinery and vehicles on site; and
- To follow up any exceedance caused by the construction works.
- Non-Road Mobile Machinery (NRMM) labels must be demonstrated on the registered equipment for inspection.

Noise
- To inspect the noise sources inside the site;
- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers;
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location;
- To provide adequate lubricant on mechanical equipments to reduce frictional noise; and

- To well maintain the mechanical equipments / machineries to avoid abnormal noise nuisance.

Water Quality

- To identify any discharge of wastewater from the construction site;
- To provide adequate temporary drainage system with adequate capacity;
- To provide adequate wastewater treatment facilities to treat the wastewater generated during construction works and heavy rain;
- To properly cover the stockpile to prevent the generation of surface runoff; and
- To avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed.

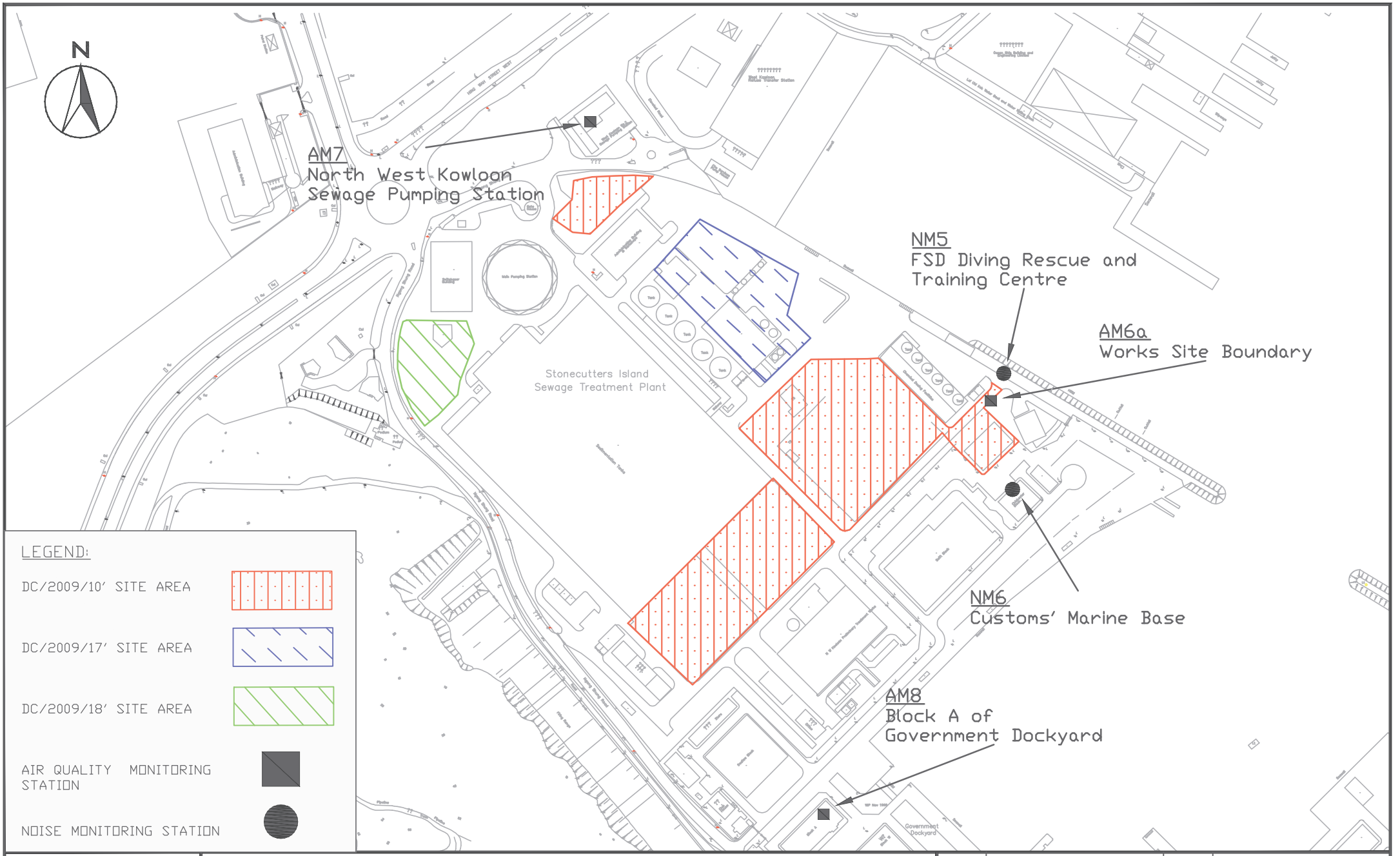
Waste/Chemical Management

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide adequate chemical waste storage area on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment; and
- To avoid improper handling or storage of oil drum and cement on site.

Landscape and Visual

- To erect and maintain the protection fence around the retained trees; and
- To avoid any construction materials being placed inside the tree protection zone.

FIGURES



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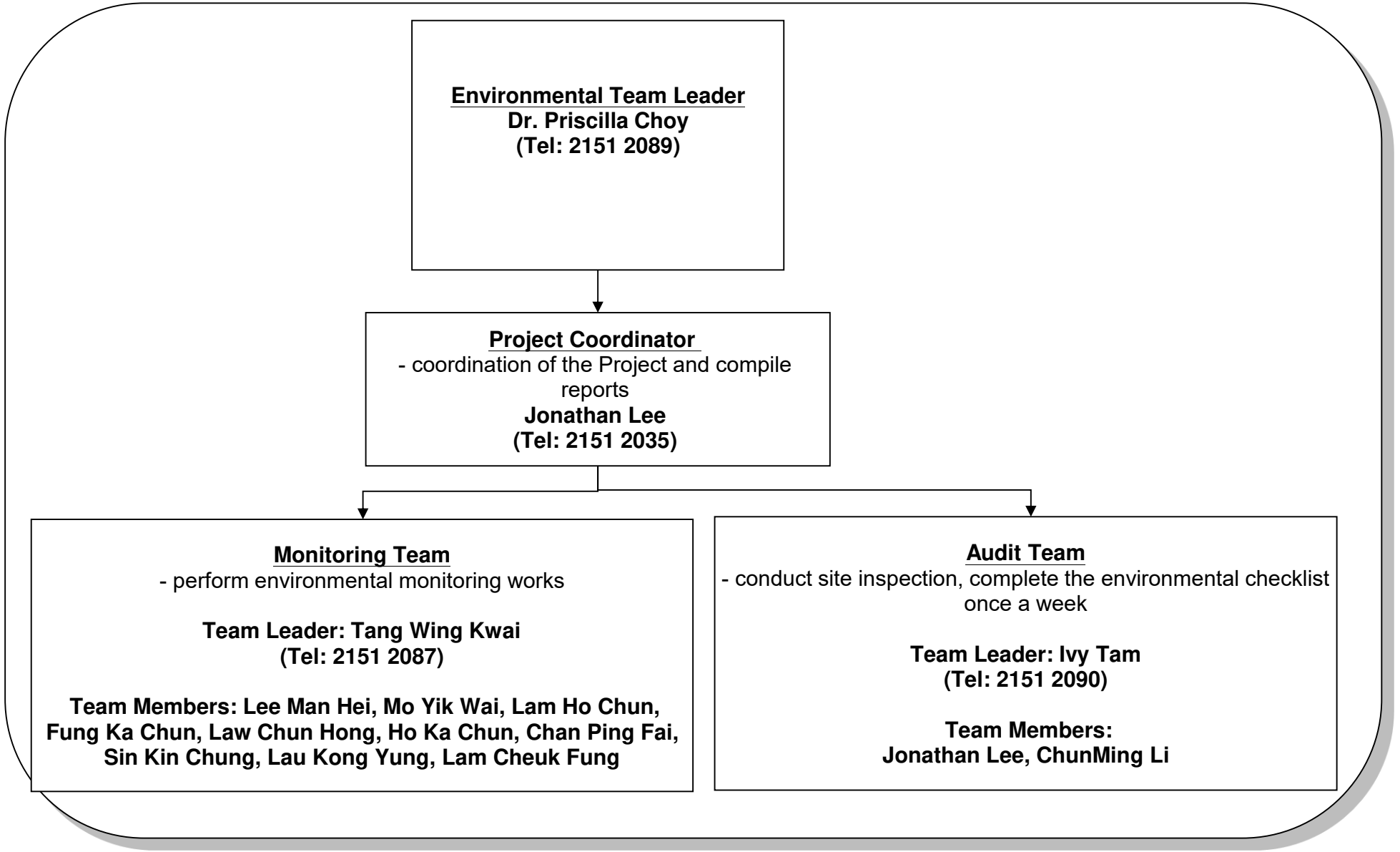
Contract No: DC/2009/10
HATS 2A - Upgrading Main Pumping Station,Sedimentation Tanks and Ancillary Facilities at SCISTW

General Location Plan of the Project and Locations of Air Quality and Noise Monitoring Stations

SCALE	N.T.S	DATE	11/2015
CHECK	–	DRAWN	VW
JOB No.	MA11007	FIGURE NO.	1
		REV	–



Title	Contract No. DC/2009/10 HATS Stage 2A – Upgrading Works at SISTW Main Pumping Station, Sedimentation Tanks and Ancillary Facilities ET's Organization Chart	Scale N.T.S	Project No. MA11007	WELLAB 匯力 consulting . testing . research
		Version v.1	Figure 2	

APPENDIX A
ACTION AND LIMIT LEVELS FOR AIR QUALITY AND NOISE QUALITY

Appendix A Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP

Monitoring Stations	Action Level (μg/m³)		Limit Level (μg/m³)	
	1-hour	24-hour	1-hour	24-hour
AM6a	346	196	500	260
AM7	322	207	500	260
AM8	307	158	500	260

Table A-2 Action and Limit Level for Construction Noise

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM5 NM6	0700-1900 hours on normal weekdays	When one documented complaint is received	75
	Evening Time of normal weekdays and General Holidays: All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day-time and evening (0700 to 2300 hours)	N/A	70(1)

Notes: If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Wellab Limited**
(EM&A Department)
Room 1701, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	31445
Date of Issue:	2019-05-14
Date Received:	2019-05-10
Date Tested:	2019-05-10
Date Completed:	2019-05-14
Next Due Date:	2019-07-13
Page:	1 of 1

ATTN: **Mr. W. K. Tang**

Certificate of Calibration

Item for Calibration:

Description	: Dust Monitor
Manufacturer	: Met One Instruments
Model No.	: AEROCET-831
Serial No.	: X23807
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 1 minute
Equipment No.	: WA-01-01

Test Conditions:

Room Temperature	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Tisch Environmental Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.132

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
General Manager

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Wellab Limited**
(EM&A Department)
Room 1701, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	31802
Date of Issue:	2019-07-15
Date Received:	2019-07-13
Date Tested:	2019-07-13
Date Completed:	2019-07-15
Next Due Date:	2019-09-12
Page:	1 of 1

ATTN: **Mr. W. K. Tang**

Certificate of Calibration

Item for Calibration:

Description	: Dust Monitor
Manufacturer	: Met One Instruments
Model No.	: AEROCET-831
Serial No.	: X23807
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 1 minute
Equipment No.	: WA-01-01

Test Conditions:

Room Temperature	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Tisch Environmental Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.093

****

PREPARED AND CHECKED BY:
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PATRICK TSE
General Manager

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Rms 1214, 1502, 1516, 1701 & 1716,
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TEST REPORT

APPLICANT: **Wellab Limited**
(EM&A Department)
Room 1701, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	31445A
Date of Issue:	2019-05-14
Date Received:	2019-05-10
Date Tested:	2019-05-10
Date Completed:	2019-05-14
Next Due Date:	2019-07-13
Page:	1 of 1

ATTN: **Mr. W. K. Tang**

Certificate of Calibration

Item for Calibration:

Description	: Dust Monitor
Manufacturer	: Met One Instruments
Model No.	: AEROCET-831
Serial No.	: X23808
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 1 minute
Equipment No.	: WA-01-02

Test Conditions:

Room Temperature	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Tisch Environmental Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.135

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

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General Manager

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TEST REPORT

APPLICANT: **Wellab Limited**
(EM&A Department)
Room 1701, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	31802A
Date of Issue:	2019-07-15
Date Received:	2019-07-13
Date Tested:	2019-07-13
Date Completed:	2019-07-15
Next Due Date:	2019-09-12
Page:	1 of 1

ATTN: **Mr. W. K. Tang**

Certificate of Calibration

Item for Calibration:

Description	: Dust Monitor
Manufacturer	: Met One Instruments
Model No.	: AEROCET-831
Serial No.	: X23808
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 1 minute
Equipment No.	: WA-01-02

Test Conditions:

Room Temperature	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Tisch Environmental Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.106

****

PREPARED AND CHECKED BY:
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General Manager

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TEST REPORT

APPLICANT: **Wellab Limited**
(EM&A Department)
Room 1701, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	31701A
Date of Issue:	2019-06-19
Date Received:	2019-06-18
Date Tested:	2019-06-18
Date Completed:	2019-06-19
Next Due Date:	2019-08-18
Page:	1 of 1

ATTN: **Mr. W. K. Tang**

Certificate of Calibration

Item for Calibration:

Description	: Dust Monitor
Manufacturer	: Met One Instruments
Model No.	: AEROCET-831
Serial No.	: X24477
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 1 minute
Equipment No.	: WA-01-06

Test Conditions:

Room Temperatre	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Tisch Environmental Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.104

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse
PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	29499
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2019-08-12

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21459
Microphone No.	: 43676
Equipment No.	: N-08-08

Test conditions:

Room Temperatre	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse
PATRICK TSE
Laboratory Manager

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WELLAB LIMITED
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Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W.K. Tang**

Test Report No.:	30524C
Date of Issue:	2018-12-17
Date Received:	2018-12-15
Date Tested:	2018-12-15
Date Completed:	2018-12-17
Next Due Date:	2019-12-16
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: Sound & Vibration Analyser
Manufacturer	: BSWA
Model No.	: BSWA 801
Serial No.	: 35927
Equipment No.	: N-13-03

Test conditions:

Room Temperatre	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	29816
Date of Issue:	2018-09-29
Date Received:	2018-09-28
Date Tested:	2018-09-28
Date Completed:	2018-09-29
Next Due Date:	2019-09-28

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

Test conditions:

Room Temperatre	: 17-22 degree Celsius
Relative Humidity	: 40-70%

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

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Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	29683
Date of Issue:	2018-08-20
Date Received:	2018-08-17
Date Tested:	2018-08-17
Date Completed:	2018-08-20
Next Due Date:	2019-08-19

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2412367
Equipment No.	: N-02-03

Test conditions:

Room Temperatre	: 17-22 degree Celsius
Relative Humidity	: 40-70 %

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

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High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No. MA11007/56/0022

Station	AM6 - Works Site Boundary	Operator:	MH
Date:	15-May-19	Next Due Date:	14-Jul-19
Equipment No.:	A-01-56	Serial No.	2353

Ambient Condition			
Temperature, Ta (K)	302.3	Pressure, Pa (mmHg)	758.6

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	25-Feb-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.2	3.46	60.97	7.9	2.79
2	10.0	3.14	55.23	6.5	2.53
3	7.5	2.72	47.89	5.0	2.22
4	5.2	2.26	39.94	3.2	1.77
5	3.4	1.83	32.37	2.4	1.54

By Linear Regression of Y on X

Slope , mw = 0.0449 **Intercept, bw = 0.0443**

Correlation coefficient* = 0.9971

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.97**

Remarks:

Conducted by: Lai Man Hei Signature: Lai Date: 15/5/2019

Checked by: WK Tang Signature: Kwai Date: 15/5/2019

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High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA11007/56/0023

Station AM6 - Works Site Boundary Operator: WK

Date: 15-Jul-19 Next Due Date: 14-Sep-19

Equipment No.: A-01-56 Serial No. 2353

Ambient Condition			
Temperature, Ta (K)	304.5	Pressure, Pa (mmHg)	756.2

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.6	3.50	61.63	8.1	2.81
2	10.3	3.17	55.76	6.7	2.55
3	7.6	2.72	47.95	5.1	2.23
4	5.4	2.29	40.49	3.3	1.79
5	3.2	1.77	31.26	2.1	1.43

By Linear Regression of Y on X

Slope , mw = **0.0463** **Intercept, bw :** **-0.0311**

Correlation coefficient* = **0.9982**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.94**

Remarks:

Conducted by: W.K. Tang Signature: Date: 15/7/19

Checked by: [illegible] Signature: Date: 15-7-2019

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High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA11007/55/0045

Station: AM7 - North West Kowloon Sewage Pumping Station Operator: WK

Date: 6-Jun-19 Next Due Date: 5-Aug-19

Equipment No.: A-01-55 Serial No. 2355

Ambient Condition			
Temperature, Ta (K)	302.5	Pressure, Pa (mmHg)	758.9

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.2	3.46	60.96	8.3	2.86
2	9.7	3.09	54.40	6.7	2.57
3	6.8	2.59	45.61	5.1	2.24
4	4.7	2.15	37.99	3.3	1.80
5	3.2	1.77	31.41	2.2	1.47

By Linear Regression of Y on X

Slope , mw = 0.0468 **Intercept, bw =** 0.0320

Correlation coefficient* = 0.9971

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.25**

Remarks:

Conducted by: WK Tang Signature: Date: 6/6/19

Checked by: [illegible] Signature: Date: 6-6-2019

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High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

File No. MA11007/68/0044

Station: AM8 - Block A of Government Dockyard Operator: WK

Date: 6-Jun-19 Next Due Date: 5-Aug-19

Equipment No.: A-01-68 Serial No. 3219

Ambient Condition			
Temperature, Ta (K)	302.5	Pressure, Pa (mmHg)	758.9

Orifice Transfer Standard Information					
Serial No.	0993	Slope, mc	0.0572	Intercept, bc	-0.02285
Last Calibration Date:	25-Feb-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	25-Feb-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.5	3.51	61.70	8.0	2.81
2	9.9	3.12	54.95	6.4	2.51
3	6.9	2.61	45.94	4.5	2.10
4	4.6	2.13	37.59	3.2	1.77
5	3.2	1.77	31.41	2.1	1.44

By Linear Regression of Y on X

Slope , mw = 0.0445 **Intercept, bw =** 0.0669

Correlation coefficient* = 0.9991

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.98**

Remarks:

Conducted by: W.K. Tang Signature: Date: 6/6/19

Checked by: LEE MAN LUNG Signature: Date: 6-6-2019

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RECALIBRATION DUE DATE:
February 25, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 25, 2019	**Rootsmeter S/N:** 438320	**Ta:** 294	°K
Operator:	Jim Tisch		**Pa:** 762.0	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0993**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4070	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8940	7.8	5.00
4	7	8	1	0.8520	8.7	5.50
5	9	10	1	0.7010	12.7	8.00

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)
1.0120	0.7193	1.4257	0.9958	0.7077	0.8784
1.0079	1.0079	2.0162	0.9917	0.9917	1.2423
1.0059	1.1251	2.2542	0.9898	1.1071	1.3889
1.0047	1.1792	2.3642	0.9886	1.1603	1.4567
0.9993	1.4256	2.8513	0.9833	1.4028	1.7569
QSTD	**m=**	**2.02048**	**QA**	**m=**	**1.26519**
	b=	**-0.02285**		**b=**	**-0.01408**
	r=	**0.99995**		**r=**	**0.99995**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

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.
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Village of Cleves, OH 45002

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TOLL FREE: (877)263-7610
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APPENDIX C
ENVIRONMENTAL MONITORING SCHEDULES

DC/2009/10, HATS 2A Upgrading Main Pumping Station, Sedimentation Tanks and Ancillary Facilities at SCISTW
Impact Air Quality and Noise Monitoring Schedule (July 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
		24 hr TSP	1hr TSP X 3 Noise			
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
	24 hr TSP	1hr TSP X 3 Noise			24 hr TSP	
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
	1hr TSP X 3 Noise			24 hr TSP	1hr TSP X 3	
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
			24 hr TSP	1hr TSP X 3 Noise		
28-Jul	29-Jul	30-Jul	31-Jul			
		24 hr TSP	1hr TSP X 3 Noise			

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Air Quality Monitoring Station
AM7 - West Kowloon No.2 Sewage Pumping Station
AM8 - Block A of Government Dockyard
AM6a - Works Site Boundary

Noise Monitoring Station
NM6 - Customs' Marine Base (Block H of Government Dockyard) Rooftop
NM5 - FSD Diving Training Centre

DC/2009/10, HATS 2A Upgrading Main Pumping Station, Sedimentation Tanks and Ancillary Facilities at SCISTW
Tentative Impact Air Quality and Noise Monitoring Schedule (August 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
	24 hr TSP	1hr TSP X 3 Noise			24 hr TSP	
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
	1hr TSP X 3 Noise			24 hr TSP	1hr TSP X 3	
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
			24 hr TSP	1hr TSP X 3 Noise		
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
		24 hr TSP	1hr TSP X 3 Noise			

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Air Quality Monitoring Station
AM7 - West Kowloon No.2 Sewage Pumping Station
AM8 - Block A of Government Dockyard
AM6a - Works Site Boundary

Noise Monitoring Station
NM6 - Customs' Marine Base (Block H of Government Dockyard) Rooftop
NM5 - FSD Diving Training Centre

APPENDIX D
1-HOUR AND 24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix D - 1-hour TSP Monitoring Results

Location AM6a - Works Site Boundary

Start Date	Start Time	Weather Condition	Air Temp. (K)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. (μg/m^3)	Filter ID no.
				Initial	Final		Initial	Final		Initial	Final				
3-Jul-19	10:00	Cloudy	300.2	3.4917	3.4931	0.0014	9423.6	9424.6	1.0	1.23	1.22	1.22	73.5	19.1	190502/083
3-Jul-19	11:00	Cloudy	300.4	3.5554	3.5567	0.0013	9424.6	9425.6	1.0	1.22	1.22	1.22	73.4	17.7	190502/084
3-Jul-19	14:00	Cloudy	301.7	3.5667	3.5693	0.0026	9425.6	9426.6	1.0	1.22	1.22	1.22	73.3	35.5	190502/085
9-Jul-19	9:00	Cloudy	302.1	3.5748	3.5792	0.0044	9450.6	9451.6	1.0	1.22	1.22	1.22	73.2	60.1	190502/002
9-Jul-19	10:00	Cloudy	302.3	3.5734	3.5802	0.0068	9451.6	9452.6	1.0	1.22	1.22	1.22	73.2	92.9	190502/003
9-Jul-19	11:00	Cloudy	302.5	3.5937	3.6003	0.0066	9452.6	9453.6	1.0	1.22	1.22	1.22	73.2	90.2	190502/004
15-Jul-19	9:30	Sunny	304.1	3.4312	3.4318	0.0006	9477.6	9478.6	1.0	1.23	1.23	1.23	73.6	8.2	190601/084
15-Jul-19	13:00	Sunny	305.9	3.4675	3.4694	0.0019	9478.6	9479.6	1.0	1.22	1.22	1.22	73.3	25.9	190601/085
15-Jul-19	15:00	Sunny	305.2	3.4441	3.4450	0.0009	9479.6	9480.6	1.0	1.22	1.22	1.22	73.4	12.3	190601/086
19-Jul-19	9:00	Cloudy	303.6	3.5134	3.5155	0.0021	9504.6	9505.6	1.0	1.21	1.21	1.21	72.6	28.9	190602/013
19-Jul-19	10:00	Cloudy	303.8	3.5040	3.5051	0.0011	9505.6	9506.6	1.0	1.21	1.21	1.21	72.6	15.2	190602/014
19-Jul-19	11:00	Cloudy	304.0	3.4570	3.4585	0.0015	9506.6	9507.6	1.0	1.21	1.21	1.21	72.5	20.7	190602/015
25-Jul-19	9:30	Sunny	302.0	3.4439	3.4449	0.0010	9531.6	9532.6	1.0	1.22	1.22	1.22	73.0	13.7	190602/041
25-Jul-19	11:00	Cloudy	304.2	3.4755	3.4778	0.0023	9532.6	9533.6	1.0	1.21	1.21	1.21	72.8	31.6	190602/042
25-Jul-19	14:30	Sunny	304.6	3.5160	3.5192	0.0032	9533.6	9534.6	1.0	1.21	1.21	1.21	72.7	44.0	190602/043
31-Jul-19	8:55	Cloudy	300.6	3.4697	3.4743	0.0046	9558.6	9559.6	1.0	1.22	1.22	1.22	73.0	63.0	190602/063
31-Jul-19	9:55	Cloudy	300.8	3.4621	3.4665	0.0044	9559.6	9560.6	1.0	1.22	1.22	1.22	73.0	60.3	190602/064
31-Jul-19	10:55	Cloudy	300.8	3.4800	3.4850	0.0050	9560.6	9561.6	1.0	1.22	1.22	1.22	73.0	68.5	190602/065
													Min	8	
													Max	93	
													Average	39	

Appendix D - 1-hour TSP Monitoring Results

Location AM7 - North West Kowloon Sewage Pumping Station			
Date	Time	Weather	Particulate Concentration (µg/m^3)
3-Jul-19	13:00	Cloudy	85.6
3-Jul-19	14:00	Cloudy	87.6
3-Jul-19	15:00	Cloudy	91.5
9-Jul-19	13:00	Cloudy	155.7
9-Jul-19	14:00	Cloudy	160.0
9-Jul-19	15:00	Cloudy	158.0
15-Jul-19	14:00	Sunny	101.1
15-Jul-19	15:00	Sunny	94.7
15-Jul-19	16:00	Sunny	104.7
19-Jul-19	13:00	Cloudy	65.5
19-Jul-19	14:00	Cloudy	67.8
19-Jul-19	15:00	Cloudy	72.3
25-Jul-19	13:00	Sunny	97.8
25-Jul-19	14:00	Sunny	91.2
25-Jul-19	15:00	Sunny	95.4
31-Jul-19	9:00	Cloudy	75.6
31-Jul-19	10:00	Cloudy	78.8
31-Jul-19	11:00	Cloudy	84.5
		Minimum	65.5
		Maximum	160.0
		Average	98.2

Location AM8 - Block A of Government Dockyard			
Date	Time	Weather	Particulate Concentration (µg/m3)
3-Jul-19	9:00	Cloudy	59.5
3-Jul-19	10:00	Cloudy	55.5
3-Jul-19	11:00	Cloudy	53.7
9-Jul-19	9:00	Cloudy	159.2
9-Jul-19	10:00	Cloudy	144.2
9-Jul-19	11:00	Cloudy	145.9
15-Jul-19	9:00	Sunny	55.7
15-Jul-19	10:00	Sunny	53.8
15-Jul-19	11:00	Sunny	68.2
19-Jul-19	8:30	Cloudy	44.7
19-Jul-19	9:30	Cloudy	36.4
19-Jul-19	10:30	Cloudy	40.7
25-Jul-19	9:00	Sunny	71.7
25-Jul-19	10:00	Sunny	75.7
25-Jul-19	11:00	Sunny	72.1
31-Jul-19	9:00	Cloudy	57.7
31-Jul-19	10:00	Cloudy	61.4
31-Jul-19	11:00	Cloudy	66.0
		Minimum	36.4
		Maximum	159.2
		Average	73.5

Appendix D - 24-hour TSP Monitoring Results

Location AM6a - Works Site Boundary

Start Date	Weather Condition	Air Temp. (K)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)	Filter ID no.
			Initial	Final		Initial	Final		Initial	Final				
2-Jul-19	Cloudy	300.2	3.5416	3.5692	0.0276	9399.6	9423.6	24.0	1.22	1.22	1.22	1761.2	15.7	190502/096
8-Jul-19	Cloudy	303.1	3.5522	3.6165	0.0643	9426.6	9450.6	24.0	1.22	1.22	1.22	1756.5	36.6	190502/086
12-Jul-19	Cloudy	302.5	3.3646	3.4262	0.0616	9453.6	9477.6	24.0	1.22	1.22	1.22	1760.3	35.0	190601/052
18-Jul-19	Cloudy	305.7	3.5184	3.6303	0.1119	9480.6	9504.6	24.0	1.20	1.20	1.20	1733.6	64.5	190601/087
24-Jul-19	Cloudy	302.6	3.4240	3.4594	0.0354	9507.6	9531.6	24.0	1.22	1.21	1.21	1749.6	20.2	190602/016
30-Jul-19	Cloudy	302.1	3.5144	3.5627	0.0483	9534.6	9558.6	24.0	1.22	1.21	1.21	1749.4	27.6	190602/044
												Min	16	
												Max	65	
												Average	33	

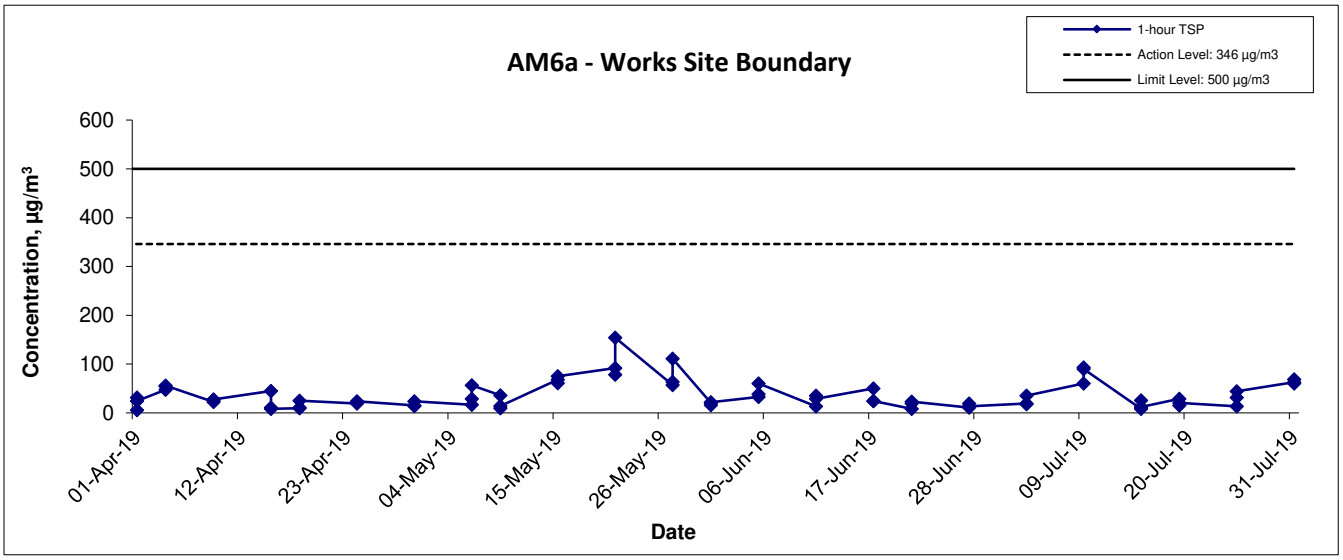
Location AM7 - North West Kowloon Sewage Pumping Station

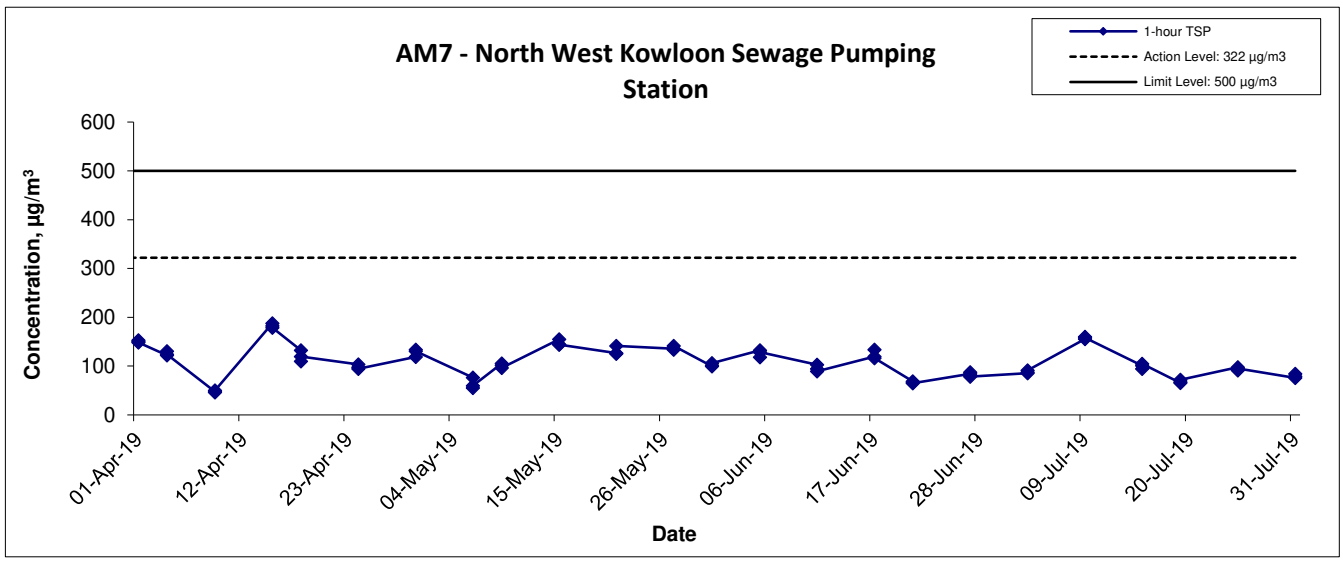
Start Date	Weather Condition	Air Temp. (K)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)	Filter ID no.
			Initial	Final		Initial	Final		Initial	Final				
2-Jul-19	Cloudy	300.1	3.4755	3.5753	0.0998	38177.3	38201.3	24.0	1.23	1.22	1.23	1764.2	56.6	190502/097
8-Jul-19	Cloudy	303.2	3.5307	3.6772	0.1465	38201.3	38225.3	24.0	1.22	1.22	1.22	1758.9	83.3	190502/088
12-Jul-19	Cloudy	302.6	3.5750	3.7352	0.1602	38225.3	38249.3	24.0	1.22	1.22	1.22	1762.7	90.9	190502/030
18-Jul-19	Cloudy	305.6	3.4987	3.8151	0.3164	38249.3	38273.3	24.0	1.21	1.21	1.21	1745.0	181.3	190502/082
24-Jul-19	Cloudy	302.4	3.4679	3.5727	0.1048	38273.3	38297.3	24.0	1.22	1.22	1.22	1761.5	59.5	190602/018
30-Jul-19	Cloudy	301.9	3.4596	3.6204	0.1608	38297.3	38321.3	24.0	1.22	1.22	1.22	1761.4	91.3	190602/046
												Min	57	
												Max	181	
												Average	94	

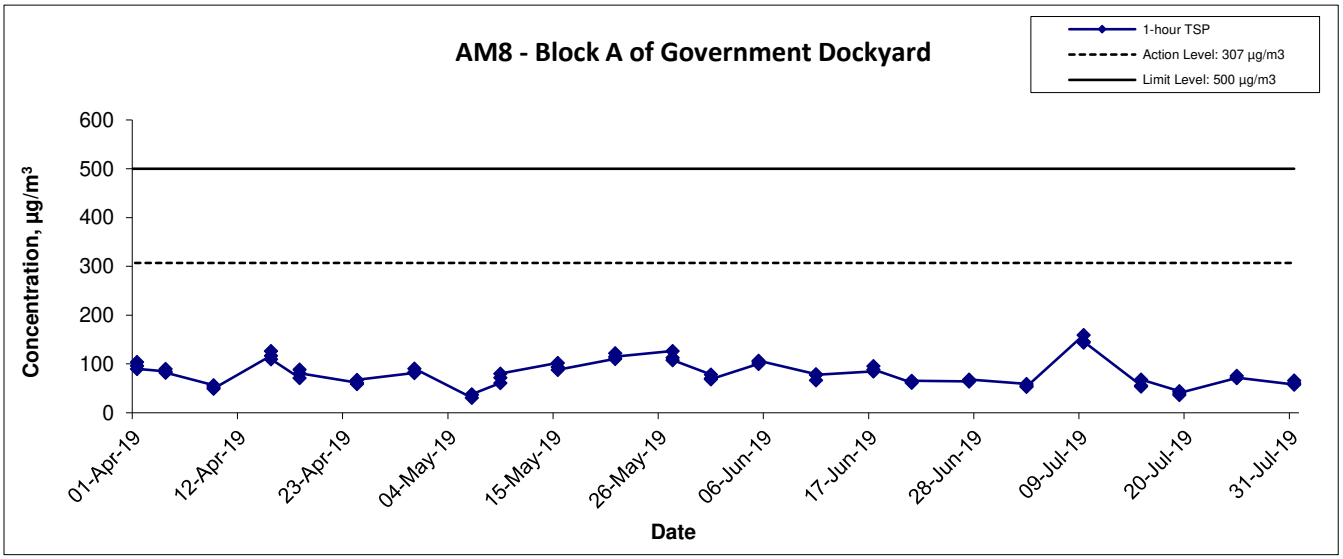
Location AM8 - Block A of Government Dockyard

Start Date	Weather Condition	Air Temp. (K)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)	Filter ID no.
			Initial	Final		Initial	Final		Initial	Final				
2-Jul-19	Cloudy	300.0	3.5083	3.5361	0.0278	11682.0	11706.0	24.0	1.22	1.22	1.22	1756.7	15.8	190502/100
8-Jul-19	Cloudy	303.1	3.4908	3.5557	0.0649	11706.0	11730.0	24.0	1.22	1.22	1.22	1751.7	37.0	190502/087
12-Jul-19	Cloudy	302.4	3.5483	3.6158	0.0675	11730.0	11754.0	24.0	1.22	1.22	1.22	1755.7	38.4	190502/091
18-Jul-19	Cloudy	305.5	3.5420	3.6533	0.1113	11754.0	11778.0	24.0	1.21	1.21	1.21	1737.4	64.1	190502/089
24-Jul-19	Cloudy	302.5	3.5450	3.5810	0.0360	11778.0	11802.0	24.0	1.22	1.22	1.22	1753.6	20.5	190602/017
30-Jul-19	Cloudy	302.0	3.5158	3.5402	0.0244	11802.0	11826.0	24.0	1.22	1.22	1.22	1753.7	13.9	190602/045
												Min	14	
												Max	64	
												Average	32	

1-hr TSP Concentration Levels

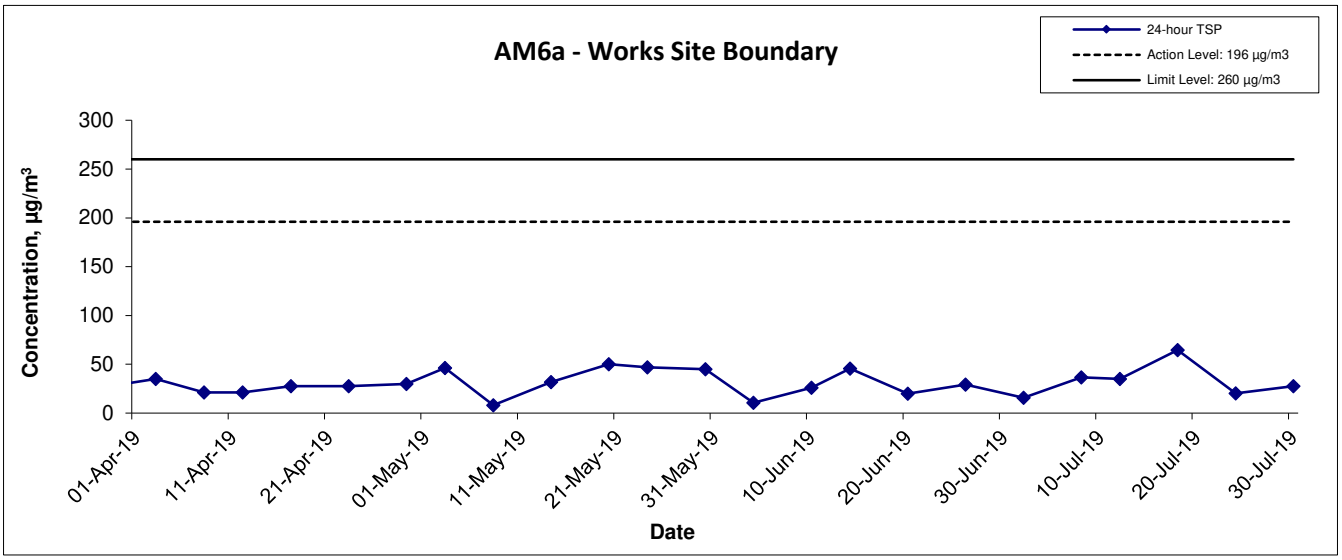


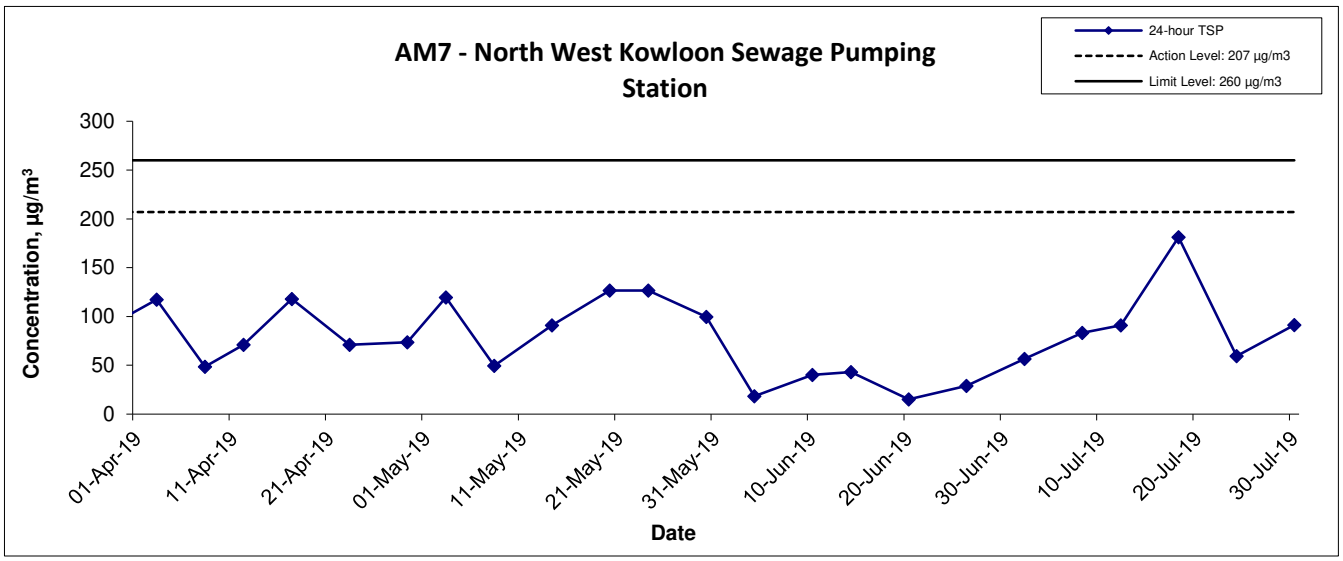


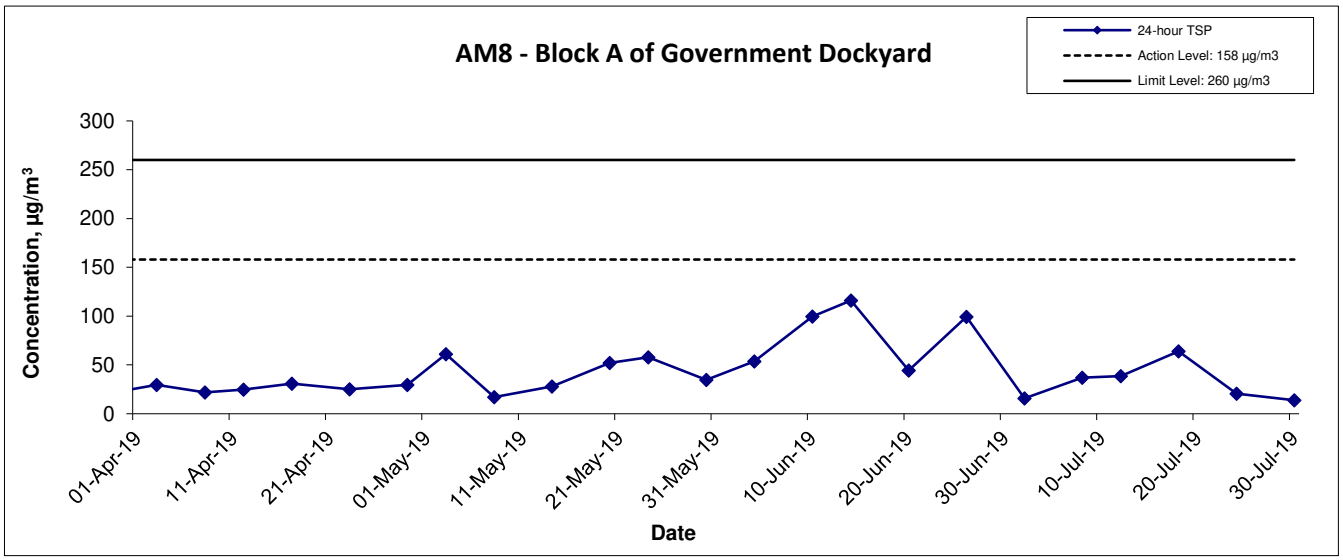


Title	Contract No. DC/2009/10 HATS 2A – Upgrading Works at SCISTW– Main Pumping Station, Sedimentation Tanks and Ancillary Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S Date Jul-19	Project No. MA11007 Appendix D	WELLAB 匯力 consulting . testing . research

24-hr TSP Concentration Levels







Title		Scale	Project No.
Contract No. DC/2009/10 HATS 2A – Upgrading Works at SCISTW– Main Pumping Station, Sedimentation Tanks and Ancillary Graphical Presentation of 24-hour TSP Monitoring Results		N.T.S	MA11007
		Date Jul 19	Appendix D

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APPENDIX E
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix E - Noise Monitoring Results

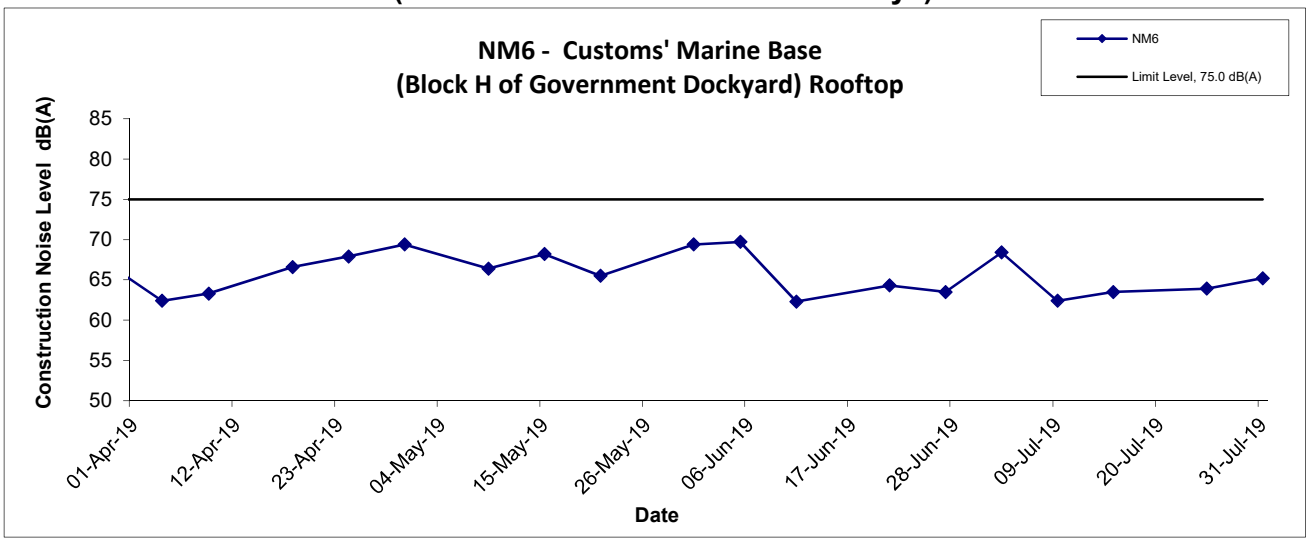
(0700-1900 hrs on Normal Weekdays)

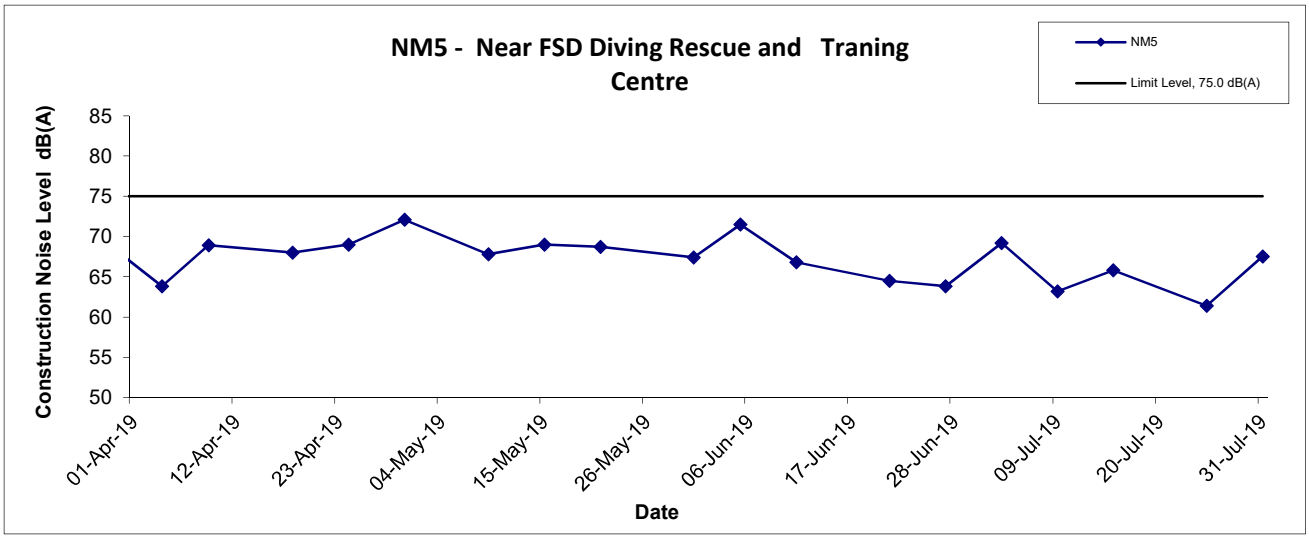
Location NM5 - Near FSD Diving Rescue and Training Centre					
Date	Time	Weather	Unit: dB (A) (30-min) Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
3-Jul-19	10:15	Cloudy	69.2	70.4	63.1
9-Jul-19	9:15	Cloudy	63.2	64.2	61.0
15-Jul-19	11:10	Sunny	65.8	67.2	60.3
25-Jul-19	10:05	Sunny	61.4	62.9	58.3
31-Jul-19	9:30	Cloudy	67.5	69.2	65.2
		Maximum	69.2		
		Minimum	61.4		

Location NM6 - Customs' Marine Base (Block H of Government Dockyard) Rooftop					
Date	Time	Weather	Unit: dB (A) (30-min) Measured Noise Level		
			L_{eq}	L_{10}	L_{90}
3-Jul-19	11:30	Cloudy	68.4	70.5	64.3
9-Jul-19	10:30	Cloudy	62.4	65.3	60.1
15-Jul-19	10:30	Sunny	63.5	65.5	59.2
25-Jul-19	11:30	Sunny	63.9	65.2	60.4
31-Jul-19	11:30	Cloudy	65.2	66.2	60.4
		Maximum	68.4		
		Minimum	62.4		

Noise Levels

(0700-1900 hrs on Normal Weekdays)





Title: Contract No. DC/2009/10 HATS 2A – Upgrading Works at SCISTW– Main Pumping Station, Sedimentation Tanks and Ancillary Graphical Presentation of Noise Monitoring Result	Scale: N.T.S Date: Jul 19	Project No.: MA11007 Appendix: E	WELLAB 匯力 consulting . testing . research

APPENDIX F
SUMMARY OF EXCEEDANCE

APPENDIX F – SUMMARY OF EXCEEDANCE

Reporting Month: July 2019

a) Exceedance Report for 1-hr TSP (NIL)

b) Exceedance Report for 24-hr TSP (NIL)

c) Exceedance Report for Construction Noise (NIL)

APPENDIX G
SITE AUDIT SUMMARY

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190704
Date	4 July 2019 (Thursday)
Time	09:30-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190704-R01	***Part A - Water Quality*** • Drainage gully inside the construction site should be covered ***Part B – Landscape and Visual*** • No environmental deficiency was identified during the site inspection ***Part C - Air Quality*** • No environmental deficiency was identified during the site inspection ***Part D – Noise*** • No environmental deficiency was identified during the site inspection ***Part E – Waste / Chemical Management***	A 4ii
190704-R02	• Housekeeping in MPS2 should be improved ***Part F - Permit / Licence*** • No environmental deficiency was identified during the site inspection ***Others*** • No environmental deficiency was identified during the site inspection ***Remark:*** • Follow-up on previous audit sessions: On previous audit session (Ref. No. 190627), all environmental deficiencies were improved by the Contractor.	E 1i

	Name	Signature	Date
Recorded by	ChunMing Li		4 July 2019
Checked by	Dr. Priscilla Choy		4 July 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190710
Date	10 July 2019 (Wednesday)
Time	09:30-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	Part A - Water Quality • No environmental deficiency was identified during the site inspection ***Part B – Landscape and Visual*** • No environmental deficiency was identified during the site inspection ***Part C - Air Quality*** • No environmental deficiency was identified during the site inspection ***Part D – Noise*** • No environmental deficiency was identified during the site inspection ***Part E – Waste / Chemical Management*** • No environmental deficiency was identified during the site inspection ***Part F - Permit / Licence*** • No environmental deficiency was identified during the site inspection ***Others*** • No environmental deficiency was identified during the site inspection ***Remark:*** • Follow-up on previous audit sessions: On previous audit session (Ref. No. 190704), all environmental deficiencies were improved by the Contractor.	

	Name	Signature	Date
Recorded by	ChunMing Li		11 July 2019
Checked by	Dr. Priscilla Choy		11 July 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190718
Date	18 July 2019 (Thursday)
Time	09:30-11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190718-R01	***Part A - Water Quality*** • No environmental deficiency was identified during the site inspection ***Part B – Landscape and Visual*** • No environmental deficiency was identified during the site inspection ***Part C - Air Quality*** • The road should be kept clean and free from dust. ***Part D – Noise*** • No environmental deficiency was identified during the site inspection ***Part E – Waste / Chemical Management*** • No environmental deficiency was identified during the site inspection ***Part F - Permit / Licence*** • No environmental deficiency was identified during the site inspection ***Others*** • No environmental deficiency was identified during the site inspection ***Remark:*** • Follow-up on previous audit sessions: On previous audit session (Ref. No. 190710), no environmental deficiency was observed during the site inspection.	C 3

	Name	Signature	Date
Recorded by	ChunMing Li		18 July 2019
Checked by	Dr. Priscilla Choy		18 July 2019

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	190725
Date	25 July 2019 (Thursday)
Time	09:30-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
190725-R01	***Part A - Water Quality*** • No environmental deficiency was identified during the site inspection ***Part B – Landscape and Visual*** • No environmental deficiency was identified during the site inspection ***Part C - Air Quality*** • Dusty material should be covered by impervious material. ***Part D – Noise*** • No environmental deficiency was identified during the site inspection ***Part E – Waste / Chemical Management*** • No environmental deficiency was identified during the site inspection ***Part F - Permit / Licence*** • No environmental deficiency was identified during the site inspection ***Others*** • No environmental deficiency was identified during the site inspection ***Remark:*** • Follow-up on previous audit sessions: On previous audit session (Ref. No. 190718), all environmental deficiencies were improved by the Contractor.	C 6

	Name	Signature	Date
Recorded by	ChunMing Li		29 July 2019
Checked by	Dr. Priscilla Choy		29 July 2019

APPENDIX H
SUMMARY OF AMOUNT OF WASTE GENERATED

Name of Department: DSD

Contract No. : DC/2009/10

Monthly Summary Waste Flow Table for 2019 (year)

Month	Actual Quantities of inert C&D Materials Generated Monthly						Actual Quantities of C&D Materials Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard	Plastics (see Note 3)	Chemical Waste	Other, e.g. general refuse
	(In '000m^3)	(In '000m^3)	(In '000m^3)	(In '000m^3)	(In '000m^3)	(In '000m^3)	(In '000kg)	(In '000kg)	(In '000kg)	(In '000kg)	(In '000m^3)
Jan	0.322	0.322	0.000	0.000	0.322	0.000	0.000	0.000	0.000	0.000	0.007
Feb	0.089	0.089	0.000	0.000	0.089	0.000	0.000	0.000	0.000	0.000	0.005
Mar	0.205	0.205	0.000	0.000	0.205	0.000	0.000	0.000	0.000	0.000	0.019
Apr	0.183	0.183	0.000	0.000	0.183	0.000	0.000	0.000	0.000	0.000	0.005
May	0.142	0.142	0.000	0.000	0.142	0.000	0.000	0.000	0.000	0.715	0.010
June	0.187	0.187	0.000	0.000	0.187	0.000	0.000	0.000	0.000	0.000	0.011
Sub-total	1.128	1.128	0.000	0.000	1.128	0.000	0.000	0.000	0.000	0.715	0.057
July	0.181	0.181	0.000	0.000	0.181	0.000	0.000	0.000	0.000	0.000	0.016
Aug											
Sep											
Oct											
Nov											
Dec											
Total	1.309	1.309	0.000	0.000	1.309	0.000	0.000	0.000	0.000	0.715	0.073
Total since commencement of project	61.094	61.094	0.000	0.000	61.094	0.000	372.871	9.899	3.314	2.942	2.033

Notes:
(1) The performance targets are given in PS Clause 25.41(14).
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
(4) The conversion factor for tonne to m^3 for inert C&D materials is 1.9 tonne/m^3.
(5) The conversion factor for tonne to m^3 for general refuse is 1.8 tonne/m^3.

APPENDIX I
EVENT ACTION PLANS

APPENDIX I – Event / Action Plans

Table I-1 Event / Action Plan For Air Quality

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	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; 8. If exceedance stops, cease additional monitoring	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; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failurein writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	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 ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and	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. Ensure remedial measures properly implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring	advise the ER accordingly; 5. Supervise the implementation of remedial measures.	5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Table I-2 Event / Action Plan For Construction Noise

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action Level being exceeded	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 on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures	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	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals
Limit Level being exceeded	1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	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; 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	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; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated

APPENDIX J
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

APPENDIX J IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
A	**Air Quality**		
3.74	Skip hoist for material transport should be totally enclosed by impervious sheeting.	All construction sites	^
	Vehicle washing facilities should be provided at every vehicle exit point.		^
	The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore.		^
	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.		N/A
	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.		*
	Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.		^
	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.		#
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.		^
	Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.		^
	Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides.		^
	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.		^
3.74	Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All construction sites	^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
B	**Airborne Noise**		
4.56–4.61	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	^
4.67	Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program.		^
	Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program.		^
	Mobile plant, if any, shall be sited as far away from NSRs as possible.		^
	Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum.		^
4.67	Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.		^
	Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.		^
C	**Water Quality**		
6.349 to 6.375	Construction Site Runoff and General Construction Activities The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	All construction sites	*
6.376	Effluent Discharge There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD. Minimum distances of 100 m should be maintained between the discharge points of construction site effluent and the existing saltwater intakes.		^
6.377	Accidental Spillage of Chemicals Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General)		^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	Regulation should be observed and complied with for control of chemical wastes.		
6.378	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.		^
6.379	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.		^
6.380	Construction Works in Close Proximity of Storm Drains or Seafront: To minimize the potential water quality impacts from the construction works located at or near any watercourse, the practices outlined below should be adopted where applicable. • The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment. • Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. • Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. • Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable. • Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea.	All construction sites	^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
D	**Waste Management**		
9.107	Reusable steel or concrete panel shutters, fencing and hoarding and signboard should be used as a preferred alternative to items made of wood, to minimize wastage of wood. Attention should be paid to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards to reduce the amount of timber used on construction sites. Metallic alternatives to timber are readily available and should be used rather than new timber. Precast concrete units should be adopted wherever feasible to minimize the use of timber formwork.	All construction sites	^
9.109	All waste materials should be segregated into categories covering: • excavated materials suitable for reuse on-site; • excavated materials suitable for public filling facilities; • remaining C&D waste for landfill; • chemical waste; and • general refuse for landfill.	All construction sites	^
9.113	Sort C&D waste from demolition of existing facilities to recover recyclable portions such as metals.		^
	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.		^
	Encourage collection of aluminum cans, PET bottles and paper by providing separate labeled bins to enable these wastes to be segregated from other general refuse generated by the work force.		^
	Any unused chemicals or those with remaining functional capacity shall be recycled.		^
	Proper storage and site practices to minimize the potential for damage or contamination of construction materials.		^
9.115	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.		^
	Training of site personnel in proper waste management and chemical waste handling procedures.		^
9.115	Develop and provide toolbox talk for on-site sorting of C&D materials to enhance worker's awareness in handling, sorting, reuse and recycling of C&D materials.		^
	Provision of sufficient waste disposal points and regular collection of waste.		*
	Regular cleaning and maintenance programme for drainage systems, sumps and oil		^

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
	interceptors.		
9.125	Bentonite slurries used in diaphragm wall construction should be reconditioned and reused wherever practicable. The disposal of residual used bentonite slurry should follow the good practice guidelines stated in ProPECC PN 1/94 "Construction Site Drainage".	All construction sites	^
9.131	Adequate number of portable toilets at temporary works areas or the PTWs to ensure that sewage from site staff would be properly collected.		^
9.133	General refuse should be stored in enclosed bins, skips or compaction units separating from C&D material and disposed of at designated landfill.		^
9.135	The recyclable component of the municipal waste generated by the workforce, such as aluminum cans, paper and cleansed plastic containers should be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste should be set up by the Contractor. The Contractor should also be responsible for arranging recycling companies to collect these materials.		^
9.137	If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.		^
9.142	Prior to excavation of the marine deposit layer, the deposit should be tested in accordance with the ETWB TC(W) No. 34/2002 and the results should be presented in a Preliminary Sediment Quality Report. The marine deposit should be disposed of at the disposal site designated by the Marine Fill Committee (MFC) or Director of Environmental Protection (DEP) depending on the test results.		N/A

EIA Ref.	Recommended Mitigation Measures	Location of the measure	Implementation Status
E	**Terrestrial Ecology**		
10.94	To implement effective noise mitigation measures as recommended in Section 4 of EIA.	All construction sites	N/A
10.95	Dust control practices such as regular watering, complete coverage of any aggregate or dusty material storage piles, and re-schedule of dusty activities during high-wind conditions as well as other measures recommended in Section 3 of EIA, should be implemented.		^
10.96	Fences/hoardings should be erected and installed along the boundary of the works areas.		^
10.97	Standard good site practices as suggested in Section 10 of EIA should be implemented.		N/A
10.98	Provision of proper drainage system and runoff control measures such as use of sand/silt traps, oil/grease separators, sedimentation tanks, etc.		^
F	**Landscape and Visual**		
Table 13.7	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	All construction sites	^
	Existing trees to be retained on site should be carefully protected during construction.		^
	Trees unavoidably affected by the works should be transplanted where practical.		^
	Compensatory tree planting should be provided to compensate for felled trees.		^
	Control of night-time lighting.		^
Table 13.7	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A
G	**Marine Ecology**		
11.137	To minimize the potential indirect impacts on water quality from construction site runoff and various construction activities, the practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted.	All construction sites	^
H	**Hazard to Life**		
14A.201	Limiting use of cranes in terms of locations, lifting height, swing angle and setting up safety zone.	Exact location will be determined on construction site by the engineer	^

Remarks:	^ Compliance of mitigation measure;
	N/A Not Applicable;
	* Recommendation was made during site audit but improved/rectified by the contractor.
	# Recommendation was made during site audit and to be improved / rectified by the contractor.
	X Non-compliance of mitigation measure;
	● Non-compliance but rectified by the contractor;

APPENDIX K
COMPLAINT LOG

APPENDIX K – COMPLAINT LOG

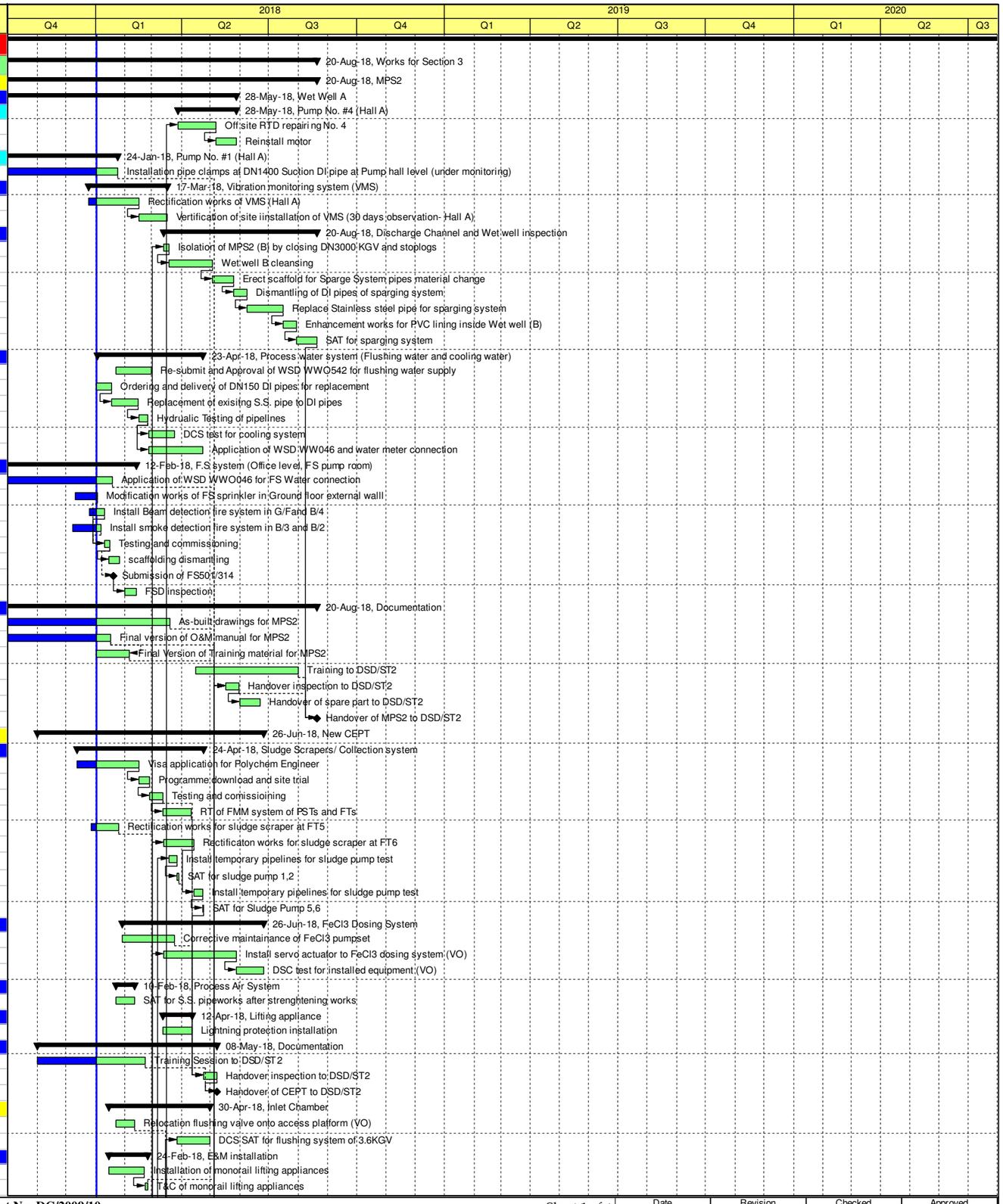
Reporting Month: July 2019

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Remarks: No environmental complaint was received in the reporting month.

APPENDIX L
CONSTRUCTION PROGRAMME

Activity ID	Activity Name	Activity % Complete	Original Duration	Start	Finish
Target Works Programme (Completion for Section 3, 4 and 5)					
Works for Section 3					
MPS2					
Wet Well A					
Pump No. #4 (Hall A)					
A4710	Off site RTD repairing No. 4	0%	40	28-Mar-18	07-May-18
A4730	Reinstall motor	0%	15	07-May-18	28-May-18
Pump No. #1 (Hall A)					
A8460	Installation pipe clamps at DN1400 Suction DI pipe at Pump hall level (under monitoring)	80%	100	14-Sep-17 A	24-Jan-18
Vibration monitoring system (VMS)					
A8965	Rectification works of VMS (Hall A)	15%	45	25-Dec-17 A	15-Feb-18
A8970	Vertification of site iinstallation of VMS (30 days observation- Hall A)	0%	30	15-Feb-18	17-Mar-18
Discharge Channel and Wet well inspection					
A8480	Isolation of MPS2 (B) by closing DN3000 KGV and stoplogs	0%	5	13-Mar-18	19-Mar-18
A8490	Wet well B cleansing	0%	35	19-Mar-18	03-May-18
A9300	Erect scaffold for Sparge System pipes material change	0%	18	03-May-18	25-May-18
A9390	Dismantling of DI pipes of sparging system	0%	12	25-May-18	08-Jun-18
A9610	Replace Stainless steel pipe for sparging system	0%	30	08-Jun-18	16-Jul-18
A9615	Enhancement works for PVC lining inside Wet well (B)	0%	12	16-Jul-18	30-Jul-18
A9630	SAT for sparging system	0%	18	30-Jul-18	20-Aug-18
Process water system (Flushing water and cooling water)					
A8560	Re-submit and Approval of WSD WWO542 for flushing water supply	0%	30	22-Jan-18*	28-Feb-18
A9410	Ordering and delivery of DN150 DI pipes for replacement	30%	20	03-Jan-18 A	17-Jan-18
A9420	Replacement of exisitng S.S. pipe to DI pipes	0%	24	18-Jan-18	14-Feb-18
A9430	Hydrualic Testing of pipelines	0%	6	15-Feb-18	24-Feb-18
A9440	DCS test for cooling system	0%	24	26-Feb-18	24-Mar-18
A9450	Application of WSD WW046 and water meter connection	0%	45	26-Feb-18	23-Apr-18
F.S system (Office level, FS pump room)					
A8380	Application of WSD WWO046 for FS Water connection	75%	60	19-Jul-17 A	18-Jan-18
A8580	Modification works of FS sprinkler in Ground floor external walll	90%	15	11-Dec-17 A	03-Jan-18
A9460	Install Beam detection fire system in G/Fand B/4	35%	12	26-Dec-17 A	10-Jan-18
A9470	Install smoke detection fire system in B/3 and B/2	60%	12	08-Dec-17 A	06-Jan-18
A9480	Testing and commissioning	0%	5	10-Jan-18	16-Jan-18
A9490	scaffolding dismantling	0%	10	15-Jan-18	26-Jan-18
A9500	Submission of FS501/314	0%	0		19-Jan-18*
A9510	FSD inspection	0%	10	01-Feb-18	12-Feb-18
Documentation					
A8750	As-built drawings for MPS2	65%	180	19-Jun-17 A	19-Mar-18
A8760	Final version of O&M manual for MPS2	85%	90	19-Jun-17 A	17-Jan-18
A8770	Final Version of Training material for MPS2	0%	30	02-Jan-18	05-Feb-18
A8774	Training to DSD/ST2	0%	90	16-Apr-18*	01-Aug-18
A8780	Handover inspection to DSD/ST2	0%	12	17-May-18	31-May-18
A8790	Handover of spare part to DSD/ST2	0%	18	01-Jun-18	22-Jun-18
A8800	Handover of MPS2 to DSD/ST2	0%	0		20-Aug-18
New CEPT					
Sludge Scrapers/ Collection system					
A5995	Visa application for Polychem Engineer	15%	45	13-Dec-17 A	15-Feb-18
A6005	Programme download and site trial	0%	6	15-Feb-18	26-Feb-18
A6008	Testing and comissioining	0%	12	26-Feb-18	12-Mar-18
A6010	RT of FMM system of PSTs and FTs	0%	30	12-Mar-18	11-Apr-18
A6020	Rectification works for sludge scraper at FT5	15%	24	27-Dec-17 A	25-Jan-18
A6030	Rectificaton works for sludge scraper at FT6	0%	24	13-Mar-18	14-Apr-18
A8510	Install temporary pipelines for sludge pump test	0%	7	19-Mar-18	27-Mar-18
A9400	SAT for sludge pump 1,2	0%	2	27-Mar-18	29-Mar-18
A9640	Install temporary pipelines for sludge pump test	0%	7	14-Apr-18	23-Apr-18
A9890	SAT for Sludge Pump 5,6	0%	1	23-Apr-18	24-Apr-18
FeCl3 Dosing System					
A9520	Corrective maintainance of FeCl3 pumpset	0%	45	29-Jan-18*	24-Mar-18
A9530	Install servo actuator to FeCl3 dosing system (VO)	0%	60	13-Mar-18	28-May-18
A9540	DSC test for installed equipment (VO)	0%	24	28-May-18	26-Jun-18
Process Air System					
A5550	SAT for S.S. pipeworks after strenghtening works	0%	18	22-Jan-18*	10-Feb-18
Lifting appliance					
A9650	Lightning protection installation	0%	24	12-Mar-18*	12-Apr-18
Documentation					
A8835	Training Session to DSD/ST2	65%	120	01-Nov-17 A	22-Feb-18
A8840	Handover inspection to DSD/ST2	0%	12	24-Apr-18	08-May-18
A8850	Handover of CEPT to DSD/ST2	0%	0		08-May-18
Inlet Chamber					
A9550	Relocation flushing valve onto access platform (VO)	0%	18	22-Jan-18*	10-Feb-18
A9560	DCS SAT for flushing system of 3.6KGV	0%	24	27-Mar-18	30-Apr-18
E&M installation					
A8230	Installation of monorail lifting appliances	0%	30	15-Jan-18*	21-Feb-18
A8240	T&C of monorail lifting appliances	0%	3	22-Feb-18	24-Feb-18



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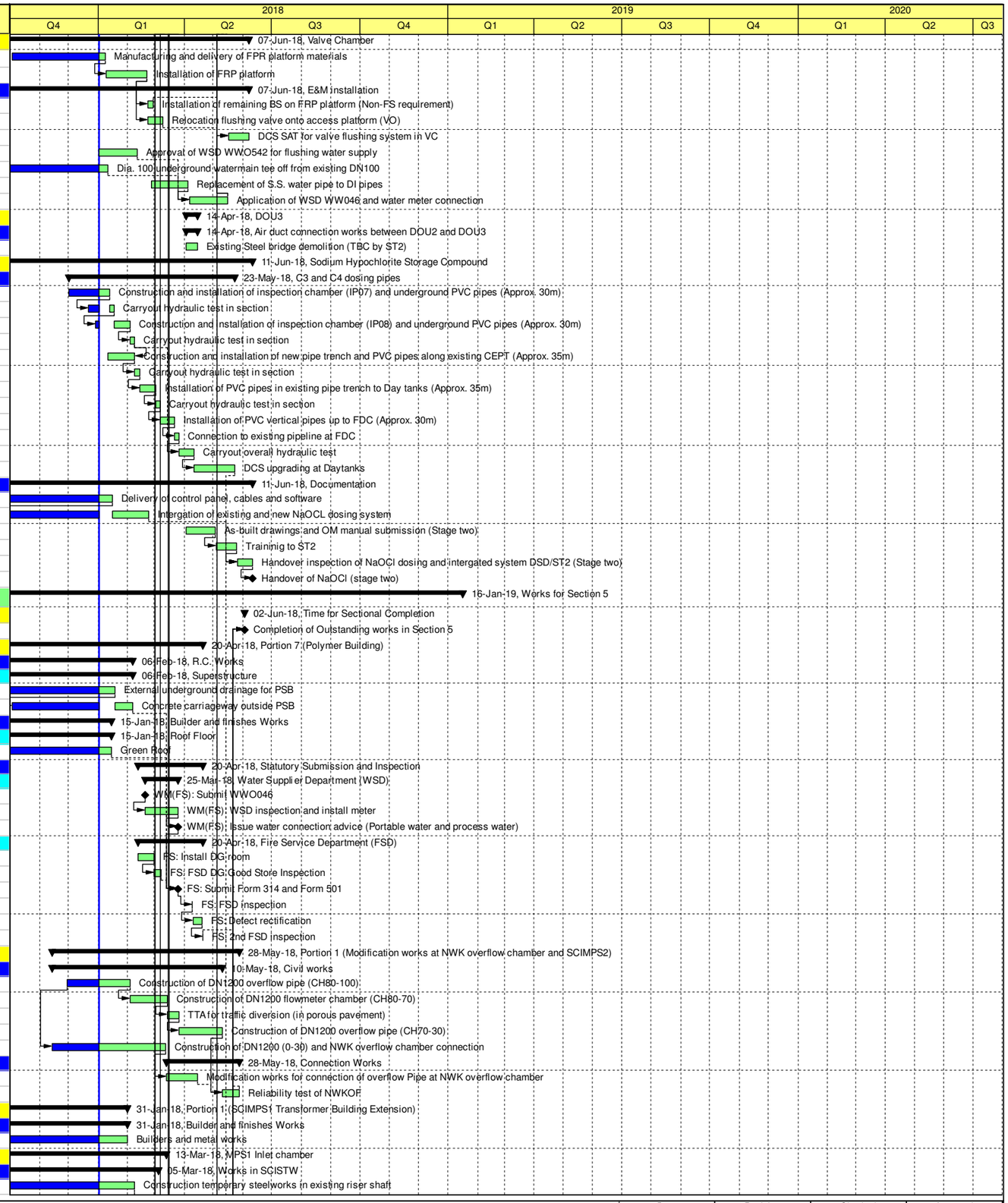
HATS Stage 2A - Upgrading works at StoneCutters Island Sewage Treatement Works

Target Works Programme for Completion of Section 3, 4 and 5

Activity ID	Activity Name	Activity % Complete	Original Duration	Start	Finish
Valve Chamber					
A3570	Manufacturing and delivery of FPR platform materials	80%	30	03-Oct-17 A	08-Jan-18
A3580	Installation of FRP platform	0%	35	09-Jan-18	21-Feb-18
E&M installation					
A7525	Installation of remaining BS on FRP platform (Non-FS requirement)	0%	5	22-Feb-18	27-Feb-18
A7526	Relocation flushing valve onto access platform (VO)	0%	14	22-Feb-18	09-Mar-18
A7536	DCS SAT for valve flushing system in VC	0%	18	17-May-18	07-Jun-18
A8120	Approval of WSD WWO542 for flushing water supply	0%	35	02-Jan-18	10-Feb-18
A8130	Dia. 100 underground watermain tee off from existing DN100	80%	45	21-Aug-17 A	11-Jan-18
A8135	Replacement of S.S. water pipe to DI pipes	0%	30	26-Feb-18*	04-Apr-18
A8140	Application of WSD WW046 and water meter connection	0%	35	06-Apr-18	16-May-18
DOU3					
Air duct connection works between DOU2 and DOU3					
A8320	Existing Steel bridge demolition (TBC by ST2)	0%	10	03-Apr-18*	14-Apr-18
Sodium Hypochlorite Storage Compound					
C3 and C4 dosing pipes					
A8010	Construction and installation of inspection chamber (IP07) and underground PVC pipes (Approx. 30m)	40%	18	01-Dec-17 A	13-Jan-18
A8020	Carryout hydraulic test in section	15%	4	22-Dec-17 A	18-Jan-18
A8030	Construction and installation of inspection chamber (IP08) and underground PVC pipes (Approx. 30m)	20%	18	29-Dec-17 A	03-Feb-18
A8040	Carryout hydraulic test in section	0%	4	03-Feb-18	08-Feb-18
A8050	Construction and installation of new pipe trench and PVC pipes along existing CEPT (Approx. 35m)	0%	24	11-Jan-18	08-Feb-18
A8060	Carryout hydraulic test in section	0%	4	08-Feb-18	13-Feb-18
A8070	Installation of PVC pipes in existing pipe trench to Day tanks (Approx. 35m)	0%	12	13-Feb-18	02-Mar-18
A8080	Carryout hydraulic test in section	0%	4	02-Mar-18	07-Mar-18
A8090	Installation of PVC vertical pipes up to FDC (Approx. 30m)	0%	12	07-Mar-18	21-Mar-18
A8100	Connection to existing pipeline at FDC	0%	4	21-Mar-18	26-Mar-18
A8110	Carryout overall hydraulic test	0%	10	26-Mar-18	11-Apr-18
A8720	DCS upgrading at Daytanks	0%	30	11-Apr-18	23-May-18
Documentation					
A3578	Delivery of control panel, cables and software	85%	85	09-May-17 A	16-Jan-18
A3585	Intergation of existing and new NaOCL dosing system	25%	40	09-Sep-17 A	23-Feb-18
A3588	As-built drawings and OM manual submission (Stage two)	0%	26	03-Apr-18*	03-May-18
A3589	Trainnig to ST2	0%	18	04-May-18	25-May-18
A3590	Handover inspection of NaOCl dosing and intergated system DSD/ST2 (Stage two)	0%	14	26-May-18	11-Jun-18
A3600	Handover of NaOCl (stage two)	0%	0		11-Jun-18
Works for Section 5					
Time for Sectional Completion					
TC0115	Completion of Outstanding works in Section 5	0%	0		02-Jun-18
Portion 7 (Polymer Building)					
R.C. Works					
Superstructure					
P700330	External underground drainage for PSB	75%	60	21-Jun-17 A	18-Jan-18
P700340	Concrete carriageway outside PSB	35%	24	03-Oct-17 A	06-Feb-18
Builder and finishes Works					
Roof Floor					
P701140	Green Roof	50%	24	15-Sep-17 A	15-Jan-18
Statutory Submission and Inspection					
Water Supplier Department (WSD)					
P905070	WM(FS): Submit WWO046	0%	0	19-Feb-18*	
P905080	WM(FS): WSD inspection and install meter	0%	35	19-Feb-18	25-Mar-18
P905090	WM(FS): Issue water connection advice (Portable water and process water)	0%	0		25-Mar-18
Fire Service Department (FSD)					
P905370	FS: Install DG room	0%	12	12-Feb-18*	28-Feb-18
P905380	FS: FSD DG Good Store Inspection	0%	7	28-Feb-18	07-Mar-18
P905390	FS: Submit Form 314 and Form 501	0%	0		25-Mar-18
P905400	FS: FSD inspection	0%	1	09-Apr-18	09-Apr-18
P905410	FS: Defect rectification	0%	9	10-Apr-18	19-Apr-18
P905420	FS: 2nd FSD inspection	0%	1	20-Apr-18	20-Apr-18
Portion 1 (Modification works at NWK overflow chamber and SCIMPS2)					
Civil works					
P101805	Construction of DN1200 overflow pipe (CH80-100)	5%	30	30-Nov-17 A	03-Feb-18
P101806	Construction of DN1200 flowmeter chamber (CH80-70)	0%	30	03-Feb-18	14-Mar-18
P101809	TTA for traffic diversion (in porous pavement)	0%	10	14-Mar-18	26-Mar-18
P101811	Construction of DN1200 overflow pipe (CH70-30)	0%	35	26-Mar-18	10-May-18
P101815	Construction of DN1200 (0-30) and NWK overflow chamber connection	5%	60	14-Nov-17 A	12-Mar-18
Connection Works					
P100330	Modification works for connection of overflow Pipe at NWK overflow chamber	0%	25	13-Mar-18	14-Apr-18
P100380	Reliability test of NWKOF	0%	14	10-May-18	28-May-18
Portion 1 (SCIMPS1 Transformer Building Extension)					
Builder and finishes Works					
P100210	Builders and metal works	15%	30	26-Jul-17 A	31-Jan-18
MPS1 Inlet chamber					
Works in SCISTW					
P600118	Construction temporary steelworks in existing riser shaft	75%	150	01-May-17 A	08-Feb-18



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HATS Stage 2A - Upgrading works at StoneCutters Island Sewage Treatement Works

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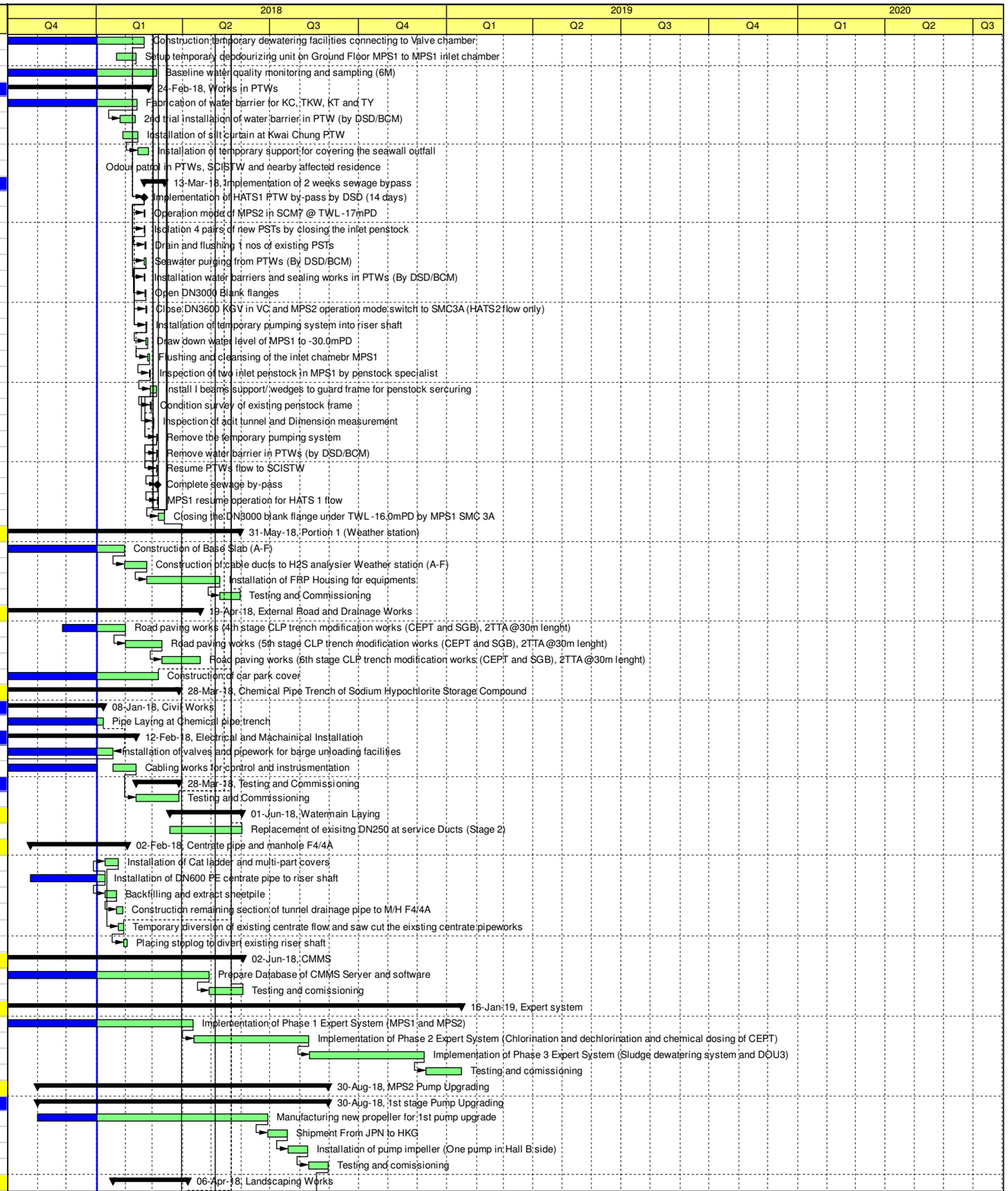
Activity ID	Activity Name	Activity % Complete	Original Duration	Start	Finish
P600128	Construction temporary dewatering facilities connecting to Valve chamber	45%	90	15-Jun-17 A	20-Feb-18
P600138	Setup temporary deodourizing unit on Ground Floor MPS1 to MPS1 inlet chamber	0%	21	22-Jan-18*	11-Feb-18
P600148	Baseline water quality monitoring and sampling (6M)	65%	180	01-Sep-17 A	05-Mar-18
Works in PTWs					
P100370	Fabrication of water barrier for KC, TKW, KT and TY	20%	45	07-Mar-17 A	12-Feb-18
P100390	2nd trial installation of water barrier in PTW (by DSD/BCM)	0%	14	26-Jan-18	10-Feb-18
P100400	Installation of silt curtain at Kwai Chung PTW	0%	14	29-Jan-18*	13-Feb-18
P100410	Installation of temporary support for covering the seawall outfall	0%	7	14-Feb-18	24-Feb-18
P600268	Odour patrol in PTWs, SCISTW and nearby affected residence	0%	1	02-Jan-18	02-Jan-18
Implementation of 2 weeks sewage bypass					
P600155	Implementation of HATS1 PTW by-pass by DSD (14 days)	0%	0	20-Feb-18	
P600156	Operation mode of MPS2 in SCM7 @ TWL-17mPD	0%	1	20-Feb-18	21-Feb-18
P600157	Isolation 4 pairs of new PSTs by closing the inlet penstock	0%	1	20-Feb-18	21-Feb-18
P600159	Drain and flushing 1 nos of existing PSTs	0%	1	21-Feb-18	22-Feb-18
P600160	Seawater purging from PTWs (By DSD/BCM)	0%	2	20-Feb-18	22-Feb-18
P600162	Installation water barriers and sealing works in PTWs (By DSD/BCM)	0%	1	20-Feb-18	21-Feb-18
P600164	Open DN3000 Blank flanges	0%	1	21-Feb-18	22-Feb-18
P600166	Close DN3600 KGV in VC and MPS2 operation mode switch to SMC3A (HATS2 flow only)	0%	1	22-Feb-18	23-Feb-18
P600176	Installation of temporary pumping system into riser shaft	0%	1	22-Feb-18	23-Feb-18
P600178	Draw down water level of MPS1 to -30.0mPD	0%	2	22-Feb-18	24-Feb-18
P600188	Flushing and cleansing of the inlet chamebr MPS1	0%	1	24-Feb-18	25-Feb-18
P600198	Inspection of two inlet penstock in MPS1 by penstock specialist	0%	1	25-Feb-18	26-Feb-18
P600208	Install I beams support/ wedges to guard frame for penstock sercuring	0%	7	26-Feb-18	05-Mar-18
P600209	Condition survey of existing penstock frame	0%	1	26-Feb-18	27-Feb-18
P600210	Inspection of adit tunnel and Dimension measurement	0%	1	01-Mar-18	02-Mar-18
P600218	Remove the temporary pumping system	0%	1	05-Mar-18	06-Mar-18
P600228	Remove water barrier in PTWs (by DSD/BCM)	0%	1	05-Mar-18	06-Mar-18
P600238	Resume PTWs flow to SCISTW	0%	1	05-Mar-18	06-Mar-18
P600248	Complete sewage by-pass	0%	0		06-Mar-18
P600258	MPS1 resume operation for HATS 1 flow	0%	1	06-Mar-18	07-Mar-18
P600278	Closing the DN3000 blank flange under TWL-16.0mPD by MPS1 SMC 3A	0%	6	07-Mar-18	13-Mar-18
Portion 1 (Weather station)					
A9050	Construction of Base Slab (A-F)	45%	45	01-Aug-17 A	30-Jan-18
A9060	Construction of cable ducts to H2S analysier Weather station (A-F)	0%	18	30-Jan-18	23-Feb-18
A9070	Installation of FRP Housing for equipments	0%	60	23-Feb-18	09-May-18
A9080	Testing and Commissioning	0%	18	09-May-18	31-May-18
External Road and Drainage Works					
RW00055	Road paving works (4th stage CLP trench modification works (CEPT and SGB), 2TTA@30m lenght)	15%	30	27-Nov-17 A	31-Jan-18
RW00057	Road paving works (5th stage CLP trench modification works (CEPT and SGB), 2TTA@30m lenght)	0%	30	31-Jan-18	10-Mar-18
RW00058	Road paving works (6th stage CLP trench modification works (CEPT and SGB), 2TTA@30m lenght)	0%	30	10-Mar-18	19-Apr-18
RW00060	Construction of car park cover	65%	150	04-Apr-17 A	07-Mar-18
Chemical Pipe Trench of Sodium Hypochlorite Storage Compound					
Civil Works					
P101160	Pipe Laying at Chemical pipe trench	90%	60	09-Mar-17 A	08-Jan-18
Electrical and Machainical Installation					
P101450	Installation of valves and pipework for barge unloading facilities	75%	60	12-Aug-17 A	18-Jan-18
P101500	Cabling works for control and instrusmentation	15%	24	06-Sep-17 A	12-Feb-18
Testing and Commissioning					
P101460	Testing and Commissioning	0%	35	12-Feb-18	28-Mar-18
Watermain Laying					
A7350	Replacement of exisitng DN250 at service Ducts (Stage 2)	0%	60	19-Mar-18*	01-Jun-18
Centrate pipe and manhole F4/4A					
A8501	Installation of Cat ladder and multi-part covers	0%	12	10-Jan-18	24-Jan-18
A8515	Installation of DN600 PE centrate pipe to riser shaft	60%	18	25-Oct-17 A	10-Jan-18
A8518	Backfilling and extract sheetpile	0%	10	10-Jan-18	22-Jan-18
A8528	Construction remaining section of tunnel drainage pipe to M/H F4/4A	0%	6	22-Jan-18	29-Jan-18
A8535	Temporary diversion of existing centrate flow and saw cut the eixsting centrate pipeworks	0%	5	24-Jan-18	30-Jan-18
A8545	Placing stoplog to divert existing riser shaft	0%	3	30-Jan-18	02-Feb-18
CMMS					
A9140	Prepare Database of CMMS Server and software	51.25%	240	01-Sep-17 A	28-Apr-18
A9150	Testing and comissioning	0%	35	29-Apr-18	02-Jun-18
Expert system					
A9090	Implementation of Phase 1 Expert System (MPS1 and MPS2)	50%	160	15-Aug-17 A	12-Apr-18
A9100	Implementation of Phase 2 Expert System (Chlorination and dechlorination and chemical dosing of CE	0%	100	13-Apr-18	10-Aug-18
A9110	Implementation of Phase 3 Expert System (Sludge dewatering system and DOU3)	0%	100	11-Aug-18	08-Dec-18
A9120	Testing and comissioning	0%	30	10-Dec-18	16-Jan-19
MPS2 Pump Upgrading					
1st stage Pump Upgrading					
A9190	Manufacturing new propeller for 1st pump upgrade	25.83%	240	01-Nov-17 A	28-Jun-18
A9200	Shipment From JPN to HKG	0%	21	29-Jun-18	19-Jul-18
A9210	Installation of pump impeller (One pump in Hall B side)	0%	18	20-Jul-18	09-Aug-18
A9220	Testing and comissioning	0%	18	10-Aug-18	30-Aug-18
Landscaping Works					



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HATS Stage 2A - Upgrading works at StoneCutters Island Sewage Treatement Works

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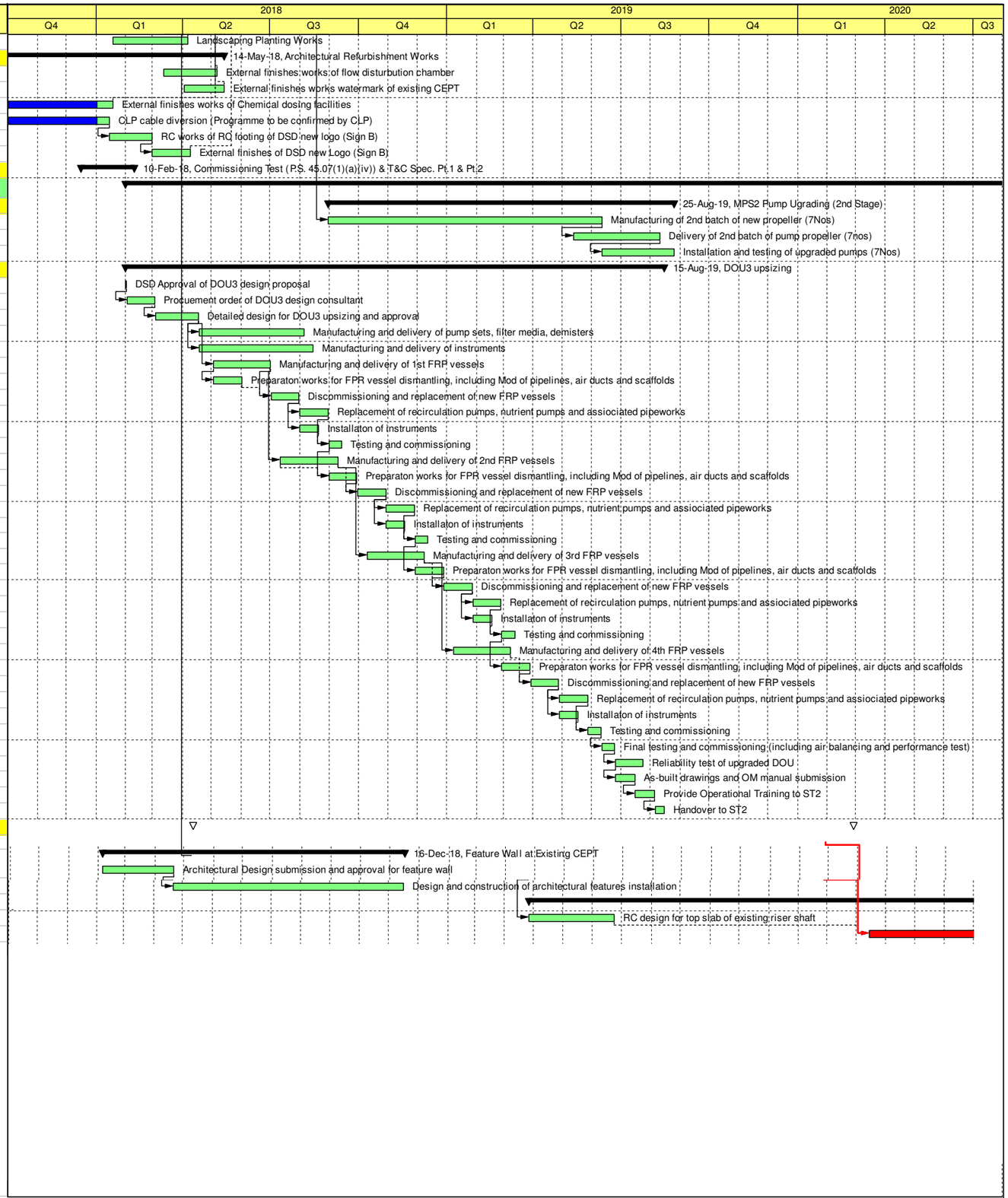
Activity ID	Activity Name	Activity % Complete	Original Duration	Start	Finish
A10010	Design and construction of architectural features installation	0%	240	21-Apr-18	16-Dec-18
Existing Riser shaft					
A10020	RC design for top slab of existing riser shaft	0%	90	26-Apr-19	24-Jul-19
A10030	Cosntruction top slab of existing riser shaft	0%	120	14-Apr-20	11-Aug-20
AR00060	External finishes works of Chemical dosing facilities	75%	60	31-Aug-17 A	18-Jan-18
AR00130	CLP cable diversion (Programme to be confirmed by CLP)	85%	90	21-Jun-17 A	15-Jan-18
AR00140	RC works of RC footing of DSD new logo (Sign B)	0%	35	15-Jan-18	28-Feb-18
AR00150	External finishes of DSD new Logo (Sign B)	0%	30	28-Feb-18	09-Apr-18
Commissioning Test (P.S. 45.07(1)(a)(iv)) & T&C Spec. Pt.1 & Pt.2					
Supplementary Agreement No.2					
MPS2 Pump Ugrading (2nd Stage)					
A9230	Manufacturing of 2nd batch of new propeller (7Nos)	0%	285	30-Aug-18	11-Jun-19
A9235	Delivery of 2nd batch of pump propeller (7nos)	0%	90	12-May-19	10-Aug-19
A9240	Installation and testing of upgraded pumps (7Nos)	0%	75	11-Jun-19	25-Aug-19
DOU3 upsizing					
A9270	DSD Approval of DOU3 design proposal	0%	1	01-Feb-18*	01-Feb-18
A9280	Procuement order of DOU3 design consultant	0%	30	02-Feb-18	03-Mar-18
A9290	Detailed design for DOU3 upsizing and approval	0%	45	04-Mar-18	17-Apr-18
A9310	Manufacturing and delivery of pump sets, filter media, demisters	0%	110	18-Apr-18	05-Aug-18
A9320	Manufacturing and delivery of instruments	0%	119	18-Apr-18	14-Aug-18
A9330	Manufacturing and delivery of 1st FRP vessels	0%	60	03-May-18	01-Jul-18
A9340	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and scaffolds	0%	30	03-May-18	01-Jun-18
A9350	Discommissioning and replacement of new FRP vessels	0%	30	02-Jul-18	31-Jul-18
A9360	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	30	01-Aug-18	30-Aug-18
A9370	Installaton of instruments	0%	20	01-Aug-18	20-Aug-18
A9380	Testing and commissioning	0%	14	31-Aug-18	13-Sep-18
A9660	Manufacturing and delivery of 2nd FRP vessels	0%	60	12-Jul-18	09-Sep-18
A9670	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and scaffolds	0%	30	31-Aug-18	29-Sep-18
A9680	Discommissioning and replacement of new FRP vessels	0%	30	30-Sep-18	29-Oct-18
A9690	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	30	30-Oct-18	28-Nov-18
A9700	Installaton of instruments	0%	20	30-Oct-18	18-Nov-18
A9710	Testing and commissioning	0%	14	29-Nov-18	12-Dec-18
A9720	Manufacturing and delivery of 3rd FRP vessels	0%	60	10-Oct-18	08-Dec-18
A9730	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and scaffolds	0%	30	29-Nov-18	28-Dec-18
A9740	Discommissioning and replacement of new FRP vessels	0%	30	29-Dec-18	27-Jan-19
A9750	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	30	28-Jan-19	26-Feb-19
A9760	Installaton of instruments	0%	20	28-Jan-19	16-Feb-19
A9770	Testing and commissioning	0%	14	27-Feb-19	12-Mar-19
A9780	Manufacturing and delivery of 4th FRP vessels	0%	60	08-Jan-19	08-Mar-19
A9790	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and scaffolds	0%	30	27-Feb-19	28-Mar-19
A9800	Discommissioning and replacement of new FRP vessels	0%	30	29-Mar-19	27-Apr-19
A9810	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	30	28-Apr-19	27-May-19
A9820	Installaton of instruments	0%	20	28-Apr-19	17-May-19
A9830	Testing and commissioning	0%	14	28-May-19	10-Jun-19
A9840	Final testing and commissioning (including air balancing and performance test)	0%	14	11-Jun-19	24-Jun-19
A9850	Reliability test of upgraded DOU	0%	30	25-Jun-19	24-Jul-19
A9860	As-built drawings and OM manual submission	0%	21	25-Jun-19	15-Jul-19
A9870	Provide Operational Training to ST2	0%	21	16-Jul-19	05-Aug-19
A9880	Handover to ST2	0%	10	06-Aug-19	15-Aug-19
Feature Wall at Existing CEPT					
A10000	Architectural Design submission and approval for feature wall	0%	75	05-Feb-18*	20-Apr-18
A10010	Design and construction of architectural features installation	0%	240	21-Apr-18	16-Dec-18
Existing Riser shaft					
A10020	RC design for top slab of existing riser shaft	0%	90	26-Apr-19	24-Jul-19
A10030	Cosntruction top slab of existing riser shaft	0%	120	14-Apr-20	11-Aug-20



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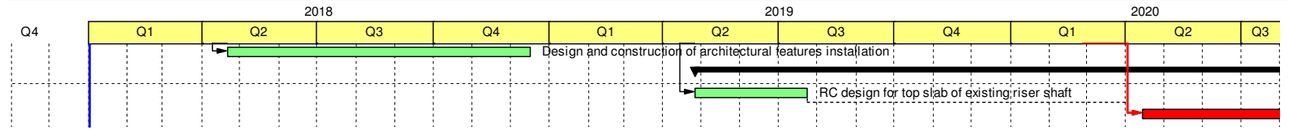
A10010	Design and construction of architectural features installation	0%	240	21-Apr-18	16-Dec-18
Existing Riser shaft					
A10020	RC design for top slab of existing riser shaft	0%	90	26-Apr-19	24-Jul-19
A10030	Cosntruction top slab of existing riser shaft	0%	120	14-Apr-20	11-Aug-20



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Contract No. DC/2009/10

HATS Stage 2A - Upgrading works at StoneCutters Island Sewage Treatement Works

Target Works Programme for Completion of Section 3, 4 and 5

Date	Revision	Checked	Approved
06-Sep-17	Rev. 1		