# 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

Quarterly Environmental Monitoring and Audit Report July to September 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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CE/Harbour Area Treatment Scheme Drainage Services Department Sewage Services Branch Harbour Area Treatment Scheme Division 5/F, Western Magistracy 2A Pokfulam Road, Hong Kong

Attn: Mr. K K Kam

Agreement No. CE 8/2009(EP) Harbour Area Treatment Scheme Stage 2A Independent Environmental Checker for Construction Phase – Investigation

Our Reference EC/AFK/DC/jl/ T261332/22.01/L-1434

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Submission of 34<sup>th</sup> Quarterly EM&A Report for July to September 2019 (v1.0)

13 March 2020

By Post

Dear Sir,

We refer to the captioned Quarterly EM&A Report for July to September 2019 (v1.0) received on 11 February 2020 and we confirm that we have no comment.

Yours faithfully for MOTT MACDONALD HONG KONG LIMITED

Ir Dr Anne F Kerr Independent Environmental Checker T +852 2828 5757 anne.kerr@mottmac.com

C.C.

Ove Arup & Partners HK Limited Sun Fook Kong – Bestwise Joint Venture Wellab Limited Mr. Mark Ngan Mr. Keith Ho Dr. Priscilla Choy Fax: 2370 4377 By email 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 34<sup>th</sup> Quarterly 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 at the SCISTW under HATS Stage 2A Environmental Permit (Permit No. EP-322/2008/G).
- 2. The site activities undertaken in the reporting quarter included:

#### July 2019:

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

#### August 2019:

#### 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

#### September 2019:

#### Valve Chamber

• Laying paving block at Valve Chamber

#### External Works

• Construction of pavement outside SHSC

#### MPS2

• Installation of FRP Platform at Wet Well Pipe Shaft

#### Overflow Chamber

• Construction of new wall in existing Overflow Chamber

# **Environmental Monitoring Works**

- 3. The environmental monitoring works conducted for the Project in this reporting quarterly period at air quality monitoring stations AM6a and noise monitoring stations NM5. Alternative location for AM6 was adopted in January 2016 as AM6a.
- 4. All the environmental monitoring works were conducted in accordance with the EM&A Manual. The monitoring results were checked and reviewed. 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.
- 5. Summary of the non-compliance of the reporting quarter is tabulated in **Table I**.

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

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

Remark

<sup>(\*)</sup> Alternative location for AM6 was adopted in January 2016 as AM6a (Please refer to Section 2.2).

## 1-hour TSP Monitoring

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

## 24-hour TSP Monitoring

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

## Construction Noise

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

## **Environmental Licenses and Permits**

9. 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**

10. 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 G**.

# Key Information in the Reporting Quarter

11. Summary of key information in the reporting quarter is tabulated in Table II.

Table II	Summary	Table for Key	y Information	n in the Reporting Quarter
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Event	<b>Event Details</b>		Action	Status	Remark
Event	Number	Nature	Taken	Status	Kemark
Complaint received	0		N/A	N/A	
Status of submissions covering the reporting quarter	3	Monthly EM&A Reports from June 2019 to August 2019	Submitted to IEC for verification	No Comment	
Notifications of any summons & prosecutions received	0		N/A	N/A	

# **Summary of Complaints and Prosecutions**

- 12. No environmental complaint and prosecution was received for the Project in the reporting quarter.
- 13. There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix H.**
- 14. The environmental concerns in the coming months are mainly on chemicals and general refuse storage, on-site treatment of surface runoff and dust control.

## **1. INTRODUCTION**

#### Background

- 1.1 The Project 'HATS Stage 2A Upgrading works at Stonecutters Island Treatment Works 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 is covered by Environmental Permit (Permit No. EP-322/2008/G), which was issued on 9<sup>th</sup> 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 Since the Contracts DC/2009/05, DE/2009/02 and DC/2007/23 in the SCISTW had been substantial completed, the environmental monitoring works at NM5, NM6, AM6, AM7 and AM8 have since been handed over to the ET of DC/2009/10 from August and September 2012.
- 1.4 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 24<sup>th</sup> February 2011. There was a change of name of the Joint Venture from Sun Fook Kong – Biwater Joint Venture to Sun Fook Kong – Bestwise Joint Venture with effect from 30 November 2018.
- 1.5 Cinotech Consultants 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 ET of this project was taken over by Wellab Limited (Wellab) starting from 1<sup>st</sup> January 2019.
- 1.6 The date of commencement of EM&A works is 14<sup>th</sup> April 2011.

## **Project Organizations**

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

	Rey Troject Contacts			
Party	Role	Name	Position	Phone No.
Ove Arup & Partners Hong	Engineer's	Mr. Ted Tang	Principle Resident Engineer	2370 4311
Kong Ltd	Seprecentative	Ms. Natalie Kwok	ER's Coordinator	2370 4356
Wellab	Environmental	Dr. Priscilla Choy	ET Leader	2151 2089

Table 1.1Key Project Contacts

Party	Role	Name	Position	Phone No.
	Team	Mr. C.M. Li	Project Coordinator	2151 2073
Mott MacDonald	Independent Environmental Checker	Dr. Anne Kerr	Independent Environmental Checker	2828 5757
Sun Fook Kong -		Mr. Keith Ho	Site Agent	2620 0070
Bestwise Joint Venture	Contractor	Mr. Leo Leung	Environmental Officer	2620 0070

## Summary of EM&A Requirements

- 1.8 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.
- 1.9 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.
- 1.10 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 for July to September 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 original 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 4<sup>th</sup> January 2016. **Table 2.1** describes the air quality monitoring locations, which are also depicted in **Figure 1**.

Table 2.1Locations for Air Quality Monitoring

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

# Monitoring Parameters, Frequency and Duration

2.3 **Table 2.2** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period could be referred to monthly reports.

 Table 2.2
 Impact Dust Monitoring Parameters, Frequency and Duration

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

# Monitoring Methodology and QA/QC Procedure

- 2.4 The monitoring methodology and QA/QC procedures are presented in the DC/2009/10.
- 2.5 The general weather conditions (i.e. sunny, cloudy or rainy) were recorded by the field staff's observation on the monitoring day.

# **Results and Observations**

- 2.6 All 1-hour and 24-hour TSP monitoring was conducted as scheduled in the reporting quarter. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B**.
- 2.7 The graphical plots of the 1-hour and 24-hour TSP monitoring results are shown in **Appendix C**.
- 2.8 According to field observations during site inspection, the identified dust sources at the monitoring stations were mainly from loading of material, vehicles movement and construction works of this Contract in 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**.

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

## Table 3.1 Location of Noise Monitoring Stations

# Monitoring Parameters, Frequency and Duration

3.4 **Table 3.2** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule could be referred to monthly reports of the respective contracts.

Table 3.2	Noise Monitoring Parameters, Frequency and Duration
	Tobse monitoring rurameters, rrequency and Duration

Monitoring Stations Parameter		Period	Frequency
NM5	L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs. on weekdays	Weekly
NM5 NM6	L <sub>eq</sub> (5 min.) dB(A)	During restricted hours	Weekly Monitoring to be conducted during the construction works

# Monitoring Methodology and QA/QC Procedures

3.5 The monitoring methodology and QA/QC procedure could be referring to Section 3 of the monthly report for Contract DC/2009/10.

# **Results and Observations**

- 3.6 The construction noise monitoring at the designated location was conducted by the ET of Contract DC/2009/10 as scheduled in the reporting quarter. The Graphical presentation of the noise monitoring result was shown in **Appendix D**.
- 3.7 No Action/Limit Level exceedance was recorded in the reporting quarter. Summary of exceedance is presented in **Appendix B**.

3.8 The major noise sources identified at the designated noise monitoring stations were generated by on-site vehicle movement and construction equipment from the Project.

# 4. ENVIRONMENTAL AUDIT

## Site Audits

- 4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.
- 4.2 13 environmental site audits were conducted by ET and 3 IEC site audits were conducted for the Project in reporting quarter. No non-compliance was observed during the site audits.
- 4.3 Site inspections were undertaken to ensure and check that the implementation and maintenance of landscape and visual mitigation measures are being properly carried out in the reporting quarter in accordance to section 14.1 of the EM&A Manual. No non-compliance was observed during the site inspections.

## **Review of Environmental Monitoring Procedures**

4.4 The monitoring works were conducted by the monitoring teams of Contracts DC/2009/10. The monitoring procedures have been reviewed monthly.

## **Status of Environmental Licensing and Permitting**

4.5 All permits/licenses obtained for the Contract DC/2009/10 are summarized in **Table 4.1**.

Reference	Valid	Period	Details	Status
Number	From	То	Details	Status
Water Dischar	ge 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	2021 The application was approved on 22/11/2016.	
<b>Registered</b> Ch	emical Wast	e Producer		
WPN5213-269- 3584-01	N/A	N/A	The application was approved on 4-5-2011.	Valid
<b>Billing</b> Accour	it for Dispos	al of Constru	uction Waste	
CSW01444	16/3/2011	N/A	The application was approved on 16-3-2011.	Valid
Notification of	Works Und	er APCO	•	
327427	N/A	N/A	Notice form received by EPD on 2-3-2011.	N/A
Construction I	Voise Permit			
GW- RW0212-19	17/05/2019	09/11/2019	The application was approved on 14-5-2019.	Valid

 Table 4.1
 Summary of Environmental Licensing and Permit Status

## Waste Management Status

4.6 The amount of Inert and Non Inert wastes generated by the construction activities of the Project in the reporting quarter is summarized in the waste flow table as shown in **Appendix E**.

### **Implementation Status of Environmental Mitigation Measures**

- 4.7 Details of the implementation of mitigation measures are provided in the **Appendix G**.
- 4.8 During the weekly environmental site inspections in the reporting period, no nonconformance was identified. The observations of the site audit for the Projects are summarized in **Table 4.2a-c.**

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	190718-R01	The road should be kept clean and free from dust.	The road was cleaned up and free from dust.
Quality	190725-R01	Dusty material should be covered by impervious material.	The dusty material was cleared.
Waste/ Chemical Management	190704-R02	Housekeeping in MPS2 should be improved.	MPS2 was cleaned up.
Landscape and Visual	190627-R01	The retained trees should be fenced.	The retained trees were fenced.
Noise	N/A	There was no observation in the reporting period.	N/A
Permit/ Licenses	N/A	There was no observation in the reporting period.	N/A

#### Table 4.2a: Observations and Recommendations of Site Audits (July 2019)

Parameters	Ref. Number	Observations	Follow Up Action	
Water Quality	190822-002	Oil stain should be cleared at the non- using drill.	Oil stain was cleared.	
	190822-001	Excavated dusty materials should be	Excavated dusty materials were	
Air	190829-001	covered by impervious materials.	stabilized by cement.	
Quality	190822-R01	Sufficient watering should be applied	Watering was applied on dust	
	190829-R01	on dust generating activities.	generating activities.	
Waste/ Chemical Management	190829-R02	General refuse should be collected regularly on MPS2.	General refuse was cleared.	
Landscape and Visual	N/A	There was no observation in the reporting period.	N/A	
Noise	N/A	There was no observation in the reporting period.	N/A	
Permit/ Licenses	N/A	There was no observation in the reporting period.	N/A	

Parameters	Ref. Number	Observations	Follow Up Action
Water Quality	190905-R02	Ponding water should be avoided.	Ponding water was avoided.
Air Quality	190911-R01	Dusty materials should be covered by impervious materials.	The excavation work was completed in this area.
	190905-R01	General refuse should be collected regularly at MPS2 ground floor hall A.	General refuse was cleared.
Waste/ Chemical Management	190919-R01	The empty oil drum should be removed or stored in designated area properly.	The oil drum was removed.
	190926-001	Chemical container should be provided with drip tray or bunding.	Follow up action will be reported in the following monthly report.
Landscape and Visual	190905-R03	Fencing should be enhanced for protection of retained trees.	Fencing was enhance to separate retained trees and working site.
Noise	N/A There was no observation in the reporting period.		N/A
Permit/ Licenses	N/A	There was no observation in the reporting period.	N/A

 Table 4.2c: Observations and Recommendations of Site Audits (September 2019)

## **Implementation Status of Event Action Plans**

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

1-hr TSP

4.10 No Action/Limit Level exceedance was recorded in the reporting quarter.

24-hr TSP

4.11 No Action/Limit Level exceedance was recorded in the reporting quarter.

Construction Noise

4.12 No Action/Limit Level exceedance was recorded in the reporting quarter.

Landscape and Visual

4.13 No non-compliance was recorded in the reporting quarter.

#### **Summary of Complaints and Prosecutions**

- 4.14 No environmental complaint and prosecution was received for the Project in the reporting quarter.
- 4.15 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix H**.

# 5. FUTURE KEY ISSUES

# Key Issues for the Coming Months

- 5.1 Key environmental issues in the coming months 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 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.

# **Construction Program for the Coming Quarter**

5.2 The tentative construction program is provided in **Appendix I.** 

## 6. CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

6.1 Environmental monitoring and audit works were performed in the reporting quarter 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 quarter. 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 quarter. No Action/Limit Level exceedance was recorded.

#### Construction Noise Monitoring

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

#### Environmental Audit

6.5 Environmental site audits were conducted as weekly basis in the reporting quarter. No noncompliance was recorded.

#### Complaint and Prosecution

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

## **Recommendations for the coming reporting period:**

6.7 The following recommendations were made for the coming reporting period:

#### Air Quality

- To provide adequate water spray on site;
- To mitigate dust generation by adequate water spraying or covering by tarpaulin during dry days;
- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works; and
- 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 and slope 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.

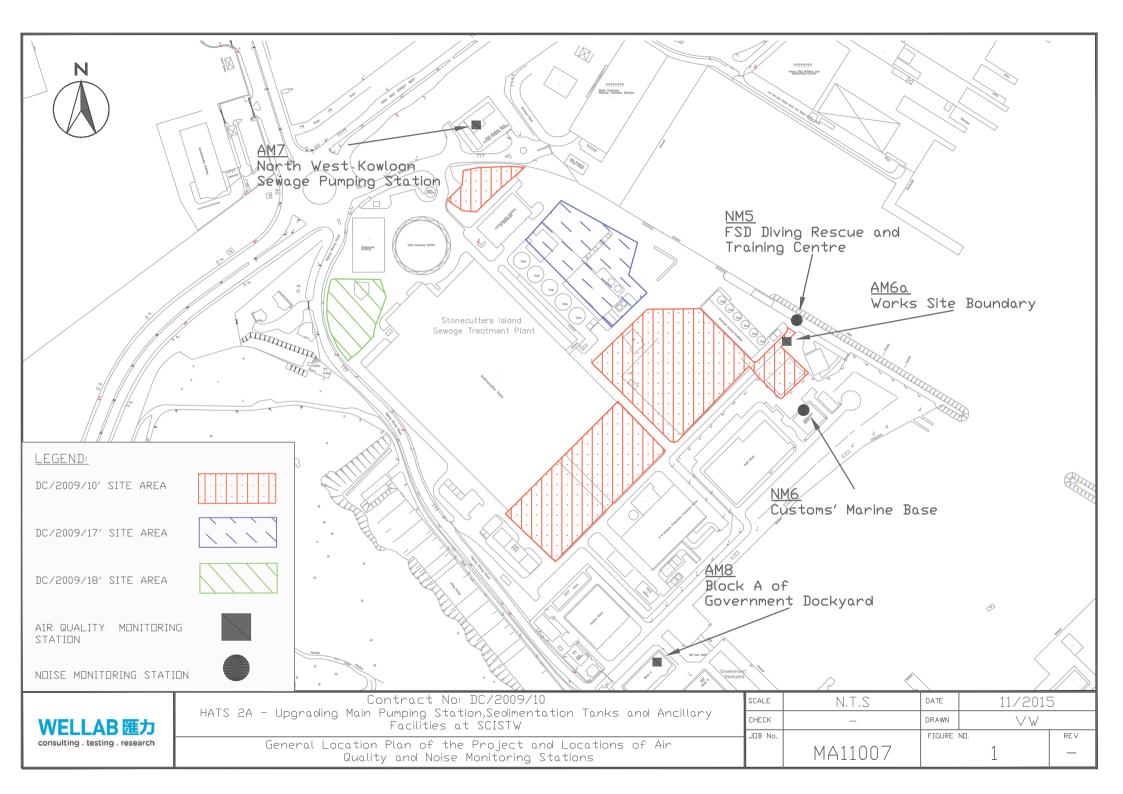
#### Waste/Chemical Management

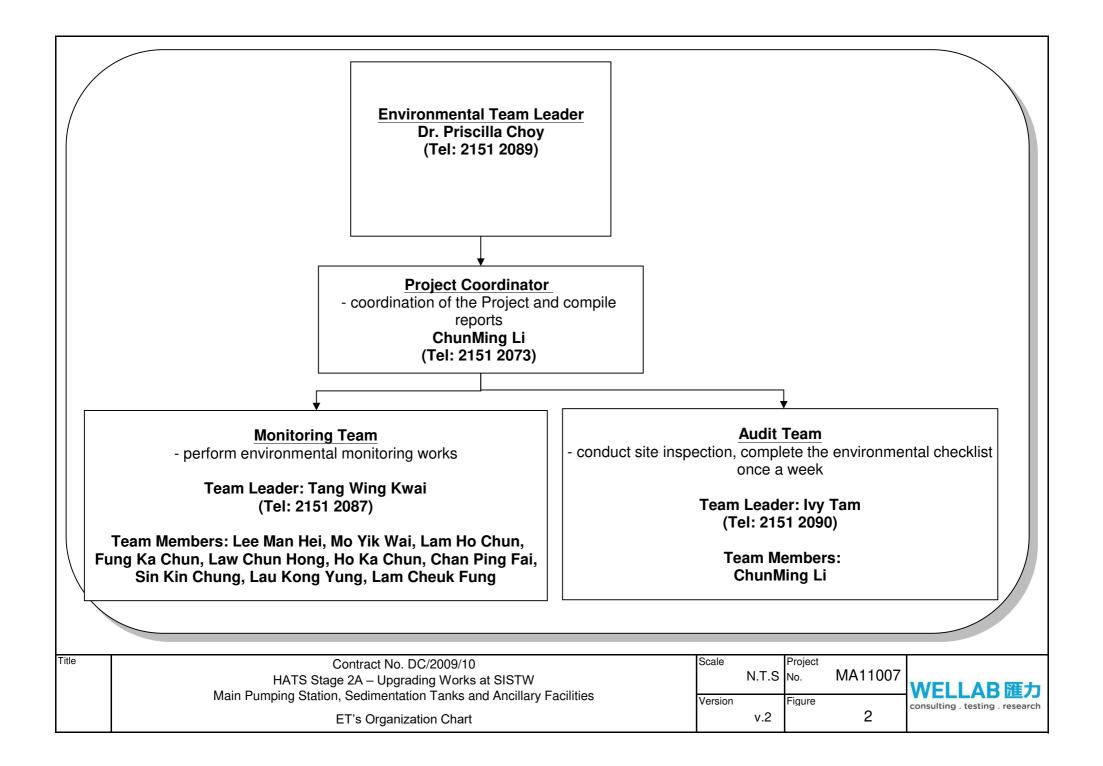
- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide adequate chemical waste storage area on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment; and
-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

#### Landscape and Visual

- To erect and maintain the protection fence around the retaining tree; and
- To avoid any heavy materials placed into tree protection zone.

FIGURES





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

# Appendix A Action and Limit Levels

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

Monitoning Stations	Action Lev	vel (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )		
Monitoring Stations	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)
	0700-1900 hours on normal weekdays	When one documented complaint is received	75
NM5 NM6	Evening Time of normal weekdays and General Holidays: All days during the evening (1900 to	N/A	70 <sup>(1)</sup>
	2300 hours), and general holidays (including Sundays) during the day- time and evening (0700 to 2300 hours)	1071	

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.

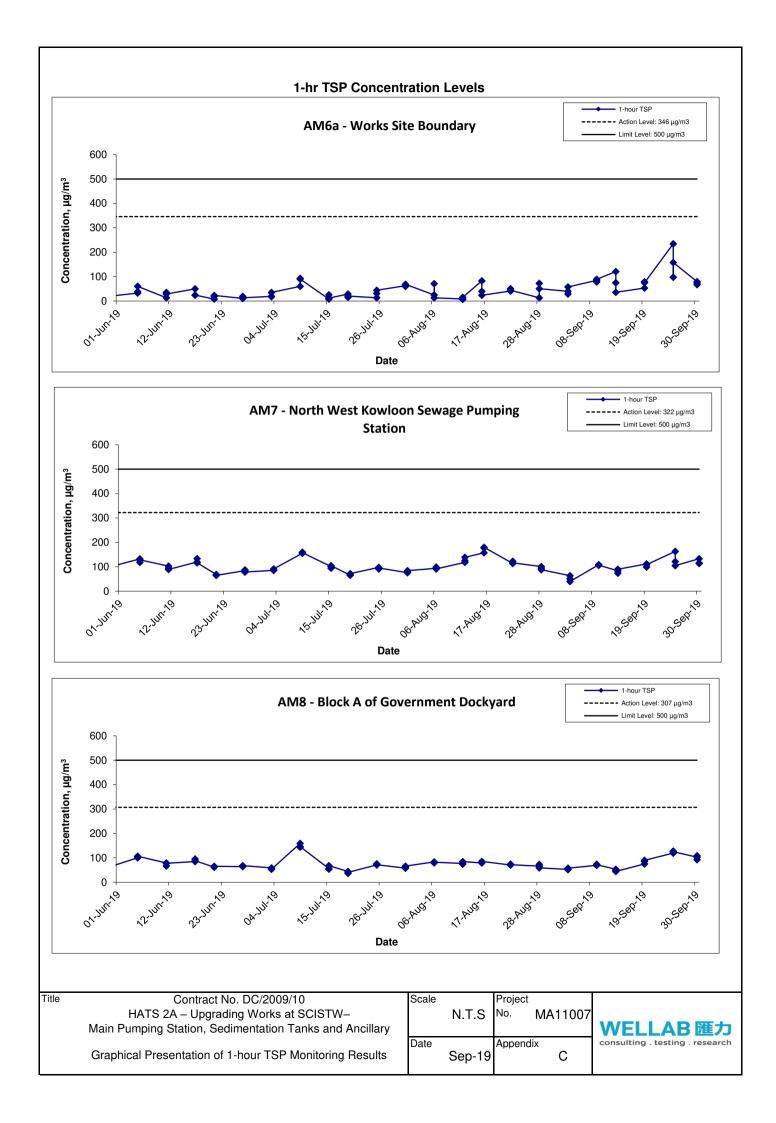
APPENDIX B SUMMARY OF EXCEEDANCE

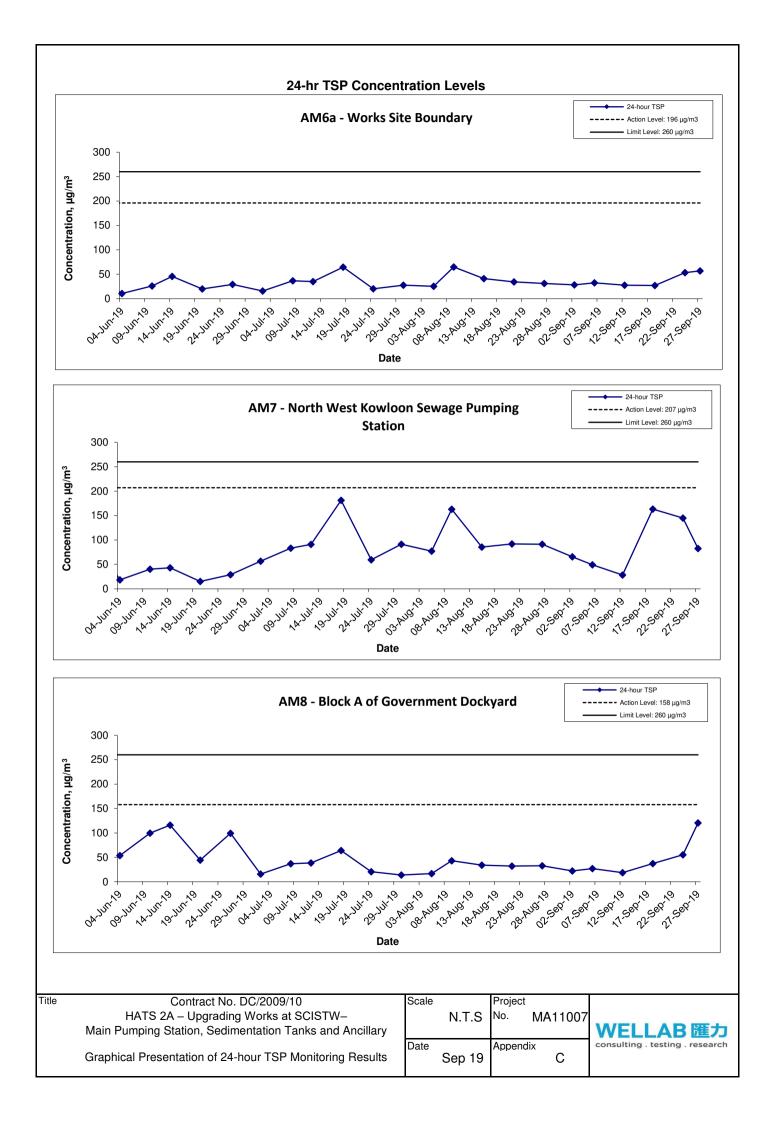
## **APPENDIX B – SUMMARY OF EXCEEDANCE**

- Reporting Quarterly: July to September 2019
- a) Exceedance Report for 1-hr TSP (NIL)
- b) Exceedance Report for 24-hr TSP (NIL)

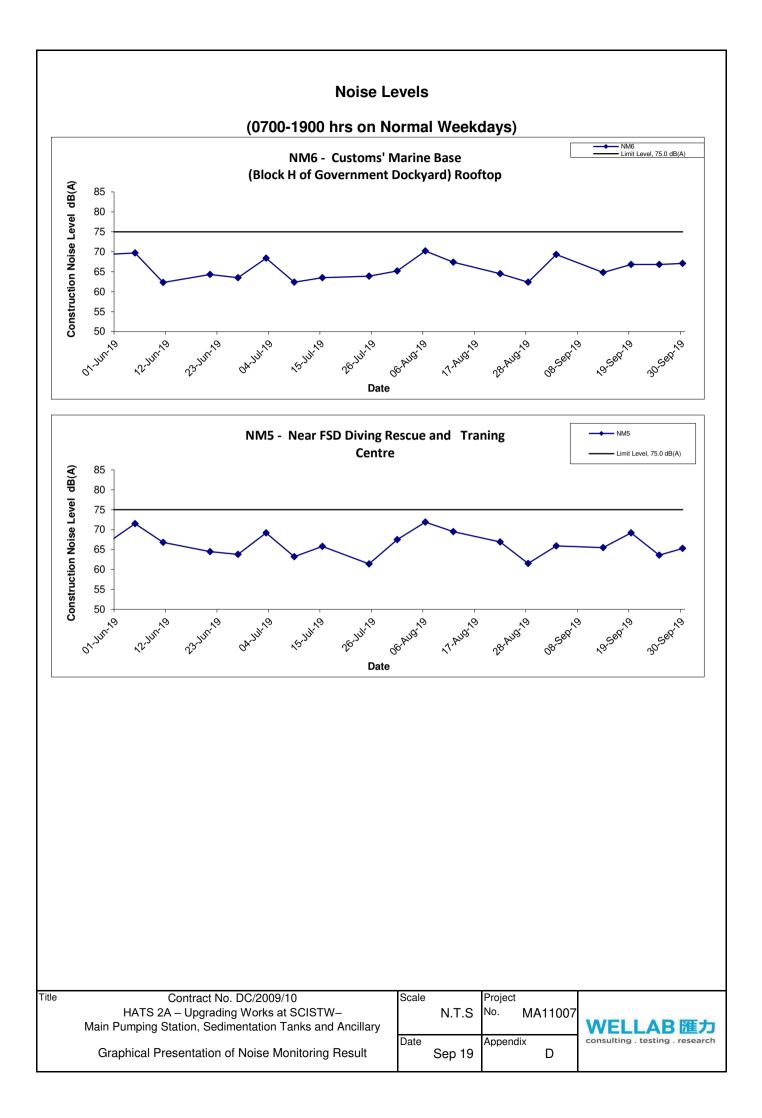
## c) Exceedance Report for Construction Noise (NIL)

APPENDIX C 1-HOUR AND 24-HOUR TSP GRAPHICAL PRESENTATION





APPENDIX D NOISE MONITORING GRAPHICAL PRESENTATIONS



APPENDIX E SUMMARY OF AMOUNT OF WASTE GENERATED Name of Department:

Contract No. : DC/2009/10

		Actual Quantities of	inert C&D Mat	erials Generate	d Monthly		Actual Quantities of C&D Materials Generated Monthly				onthly
Month	Total Quantity	Hard Rock and Large	Reused in the	Reused in	Disposed as	Imported	Metals	Paper/	Plastics	Chemical	Other, e.g.
wionui	Generated	Broken Concrete	Contract	other Projects	Public Fill	Fill		cardboard	(see Note 3)	Waste	general refuse
	$(\text{In '000m}^3)$	(In '000m <sup>3</sup> )	(In '000m <sup>3</sup> )	$(In '000m^3)$	(In '000m <sup>3</sup> )	(In '000m <sup>3</sup> )	(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	0.536	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	0.715	0.000	0.000	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	1.251	0.000	0.000	0.057
July	0.181	0.181	0.000	0.000	0.181	0.000	0.000	0.526	0.000	0.000	0.016
Aug	0.210	0.210	0.000	0.000	0.210	0.000	0.000	0.229	0.000	0.000	0.015
Sep	0.133	0.133	0.000	0.000	0.133	0.000	0.000	0.000	0.000	0.000	0.007
Oct											
Nov											
Dec											
Total	1.652	1.652	0.000	0.000	1.652	0.000	0.000	2.006	0.000	0.000	0.096
Total since commence ment of project		61.437	0.000	0.000	61.437	0.000	372.871	11.905	3.314	2.227	2.056

## Monthly Summary Waste Flow Table for 2019 (year)

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

DSD

(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<sup>3</sup>.

APPENDIX F EVENT ACTION PLANS

## **APPENDIX F – Event / Action Plans**

## Table F-1 Event / Action Plan For Air Quality

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

	ACTION								
EVENT	ET	IEC	ER	CONTRACTOR					
LIMIT LEVEL									
1. Exceedance for	1. Identify source, investigate the causes	1. Check monitoring data	1. Confirm receipt of	1. Take immediate action to					
one sample	of exceedance and propose remedial	submitted by ET;	notification of failure in	avoid further exceedance;					
	measures;	2. Check Contractor's working	writing;	2. Submit proposals for					
	2. Inform ER, Contractor and EPD;	method;	2. Notify Contractor;	remedial actions to IEC					
	3. Repeat measurement to confirm	3. Discuss with ET and	3. Ensure remedial measures	within 3 working days of					
	finding;	Contractor on possible remedial	properly implemented	notification;					
	4. Increase monitoring frequency to	measures;		3. Implement the agreed					
	daily;	4. Advise the ER on the		proposals;					
	5. Assess effectiveness of Contractor's	effectiveness of the proposed		4. Amend proposal if					
	remedial actions and keep IEC, EPD and	remedial measures;		appropriate					
	ER informed of the results.	5. Supervise implementation of							
		remedial measures							
l									

	ACTION			
EVENT	ET	IEC	ER	CONTRACTOR
2. Exceedance for	2. Exceedance for 1. Notify IEC, ER, Contractor and EPD; 1		1. Confirm receipt of	1. Take immediate action to
two or more	2. Identify source;	submitted by ET;	notification of failure in	avoid further exceedance;
consecutive	3. Repeat measurement to confirm	2. Check Contractor's working	writing;	2. Submit proposals for
samples	findings;	method;	2. Notify Contractor;	remedial actions
	4. Increase monitoring frequency to	3. Discuss amongst ER, ET, and	3. In consolidation with the	to IEC within 3 working days
	daily;	Contractor on the potential	IEC, agree with the	of notification;
	5. Carry out analysis of Contractor's	remedial actions;	Contractor on the remedial	3. Implement the agreed
working procedures to determine possible		4. Review Contractor's remedial	measures to be	proposals;
mitigation to be		actions whenever necessary to	implemented;	4. Resubmit proposals if
implemented;		assure their effectiveness and	4. Ensure remedial measures	problem still not under
6. Arrange meeting with IEC and ER to		advise the ER accordingly;	properly implemented;	control;
	discuss the remedial actions to be taken;	5. Supervise the implementation	5. If exceedance continues,	5. Stop the relevant portion of
	7. Assess effectiveness of Contractor's	of remedial measures.	consider what portion of the	works as determined by the
	remedial actions and keep IEC, EPD and		work is responsible and	ER until the exceedance is
	ER informed of the results;		instruct the Contractor to	abated
	8. If exceedance stops, cease additional		stop that portion of work	
	monitoring		until the exceedance is	
			abated.	

## Table F-2 Event / Action Plan For Construction Noise

	ACTION			
EVENT	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify ER, IEC and Contractor;	1. Review the investigation	1. Confirm receipt of	1. Submit noise mitigation
being	2. Carry out investigation;	results submitted by the ET;	notification of failure in writing;	proposals to IEC and ER;
exceeded	3. Report the results of investigation to	2. Review the proposed	2. Notify Contractor;	2. Implement noise mitigation
Checcucu	the IEC, ER and Contractor;	remedial measures by the	3. In consolidation with the IEC,	proposals
	4. Discuss with the IEC and Contractor	Contractor and advise the ER	agree with the Contractor on the	
	on remedial measures required;	accordingly;	remedial measures to be	
	5. Increase monitoring frequency to	3. Advise the ER on the	implemented;	
	check mitigation effectiveness	effectiveness of the proposed	4. Supervise the implementation of	
		remedial measures	remedial measures	
Limit Level	1. Inform IEC, ER, Contractor and EPD;	1. Discuss amongst ER, ET,	1. Confirm receipt of	1. Take immediate action to
being	2. Repeat measurements to confirm	and	notification of failure in writing;	avoid further exceedance;
exceeded	findings;	Contractor on the potential	2. Notify Contractor;	2. Submit proposals for
	3. Increase monitoring frequency;	remedial actions;	3. In consolidation with the	remedial actions to IEC
	4. Identify source and investigate the	2. Review Contractor's	IEC, agree with the Contractor on	and ER within 3 working
	cause of exceedance;	remedial	the remedial measures to be	days of notification;
	5. Carry out analysis of Contractor's	actions whenever necessary	implemented;	3. Implement the agreed
	working procedures;	to assure their effectiveness	4. Supervise the implementation of	proposals;
	6. Discuss with the IEC, Contractor and	and advise the ER	remedial measures;	4. Submit further proposal if
	ER on remedial measures required;	accordingly.	5. If exceedance continues,	problem still not under
	7. Assess effectiveness of Contractor's		consider stopping the Contractor to	control;
	remedial actions and keep IEC, EPD		continue working on that portion of	5. Stop the relevant portion
	and ER informed of the results;		work which causes the exceedance	of works as instructed by
	8. If exceedance stops, cease additional		until the exceedance is abated	the ER until the exceedance is
	monitoring			abated

APPENDIX G ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

## APPENDIX G IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EIA	Recommended Mitigation Measures	Location of the measure	Implementation Status	
Ref.				
А	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	Recommended Mitigation Measures	Location of the measure	Implementation Status
Ref.			
В	Airborne Noise		
4.56-	Use of quiet PME, movable barriers and acoustic mats.	All construction sites	٨
4.61			
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.		۸
	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,		٨
	in screening noise from on-site construction activities.		
С	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. 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	Recommended Mitigation Measures	Location of the measure	Implementation Status
Ref.			
	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	<ul> <li>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: <ul> <li>Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul> </li> </ul>		Λ
6.380	Construction Works in Close Proximity of Storm Drains or Seafront:	All construction sites	٨
	<ul> <li>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.</li> <li>The use of less or smaller construction plants may be specified to reduce the disturbance to the storm water courses or marine environment.</li> <li>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.</li> <li>Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.</li> <li>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.</li> <li>Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.</li> <li>Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert or sea.</li> </ul>		

EIA	Recommended Mitigation Measures	Location of the measure	Implementation Status
Ref.			
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	<ul> <li>All waste materials should be segregated into categories covering:</li> <li>excavated materials suitable for reuse on-site;</li> <li>excavated materials suitable for public filling facilities;</li> <li>remaining C&amp;D waste for landfill;</li> <li>chemical waste; and</li> <li>general refuse for landfill.</li> </ul>	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.		٨
	Proper storage and site practices to minimize the potential for damage or contamination of		#

	Toper storage and site practices to minimize the potential for damage of containination 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	Recommended Mitigation Measures	Location of the measure	Implementation Status
Ref.			
	intercentors		
	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	Λ
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.		٨
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.		Λ
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 Recommended Mitigation Measures		Location of the measure	Implementation Status
Ref.			

Ε	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.	٨			
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.		٨		
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.				
	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.		۸		
	Control of night-time lighting.	-	۸		
Table	Erection of decorative screen hoarding compatible with the surrounding setting.	All construction sites	N/A		
13.7					
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.		^		
Η	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:	<ul> <li>Compliance of mitigation measure;</li> </ul>			
	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 H COMPLAINT LOG

## APPENDIX H – COMPLAINT LOG

## **Reporting Quarter**: July to September 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 quarter.

APPENDIX I CONSTRUCTION PROGRAMME

ity ID	Activity Name	Activity % Complete	Original Start Duration	Finish	Q	)4	2019 Q1 Q2 Q3	Q4 Q1	2020 Q2
arget Woi	ks Programme (Completion for Section 3, 4 and 5)								
Vorks for S	Section 3				_			▼ 11-Dec-19, MPS2	
MPS2 Staircase Pre	ssurisation System (ST3)				•		<b></b>	▼ 11-Dec-19, Kill 32	urisation System (ST3)
A2725	FSC door replacement (Beam+)	100%	60 02-Jan-19 A	12-Mar-19 A			FSC door replacement (Beam+)		
A2730	Testing and commissioning of Staircase pressurisation system	100%	50 14-Jan-19A	12-Mar-19 A	_		Testing and commissioning of Staircase pressurisation system		
A2810	Relocation ductworks at B/4 Office level, FS pump room)	0%	45 09-Oct-19	11-Dec-19	•			▼ 09-Oct-19, F.S system (Office level, FS pump room	1 1 1
A9605	Installation of Fire Detection system in Wet well inlet valve (Pipe duct)	100%	40 15-Nov-18 A	09-Jan-19 A			Installation of Fire Detection system in Wet well inlet valve (Pipe duct)		
A9610	Rehearsal test for FS system	100%	6 20-Mar-19 A	26-Mar-19 A			Rehearsal test for FS system		
A9620	FSD Inspection (including FS, MVAC and Hot smoke test) chlorite Storage Compound	85%	210 27-Mar-19 A	09-Oct-19				FSD Inspection (including FS, MVAC and Hot smok	e test)
C3 and C4 de									27-Mar-20, C
	DCS upgrading at Daytanks	0%	120 02-Nov-19	27-Mar-20					DCS upgradi
Documentat A3585	on Intergation of existing and new NaOCL dosing system	60%	40 09-Sep-17 A	19-Sep-19				Intergation of existing and new NaOCL dosing system	
A3588	RT for NaOCL dosing system	0%	26 20-Sep-19*	21-Oct-19				RT for NaOCL dosing system	
A3589	Traininig to ST2	0%	10 22-Oct-19	01-Nov-19				Training to ST2	
A3600	Handover of NaOCI storage compound (stage two)	0%	0	01-Nov-19				Handover of NaOCI storage compound (sta	ge two)
A3601	Training to ST2	0%	18 28-Mar-20	21-Apr-20					Tra
A3602 A3605	Handover inspection of NaOCI Daytank DSD/ST2 (Stage three) Handover of NaOCI Daytank (stage three)	0%	14 22-Apr-20	08-May-20 08-May-20	_				
		0,0		00 may 20				▼ 14-Dec-19, Works for Sect	
orks for The for Sec	Section 5						▼ 13-Apr-19 A, Tirthe for Sectional Completion		-
TC0115	Completion of Outstanding works in Section 5	100%	0	13-Apr-19 A	-		Completion of Outstanding works in Section 5		
Portion 1 (Mo	dification works at NWK overflow chamber and SCIMPS2)						▼ 13-Apr-19 A, Portion 1 (Modification works at NW	Koverflow chamber and SCIMPS2)	
Civil works	A state of DNK000 flavor day a baseling (OLION 70)	1000/	00 44 May 40 A	10 km 40 4	wmeter chamber (CH80-70)	N	28-Mar-19A, Civil works		
P101806 P101809	Construction of DN1200 flowmeter chamber (CH80-70) TTA for traffic diversion (in porous pavement)	100%	30 14-May-18 A 10 05-Feb-19 A	19-Jun-18 A 15-Feb-19 A	wineter chamber (CH80-70)	<u>"</u>	TTAfor traffic diversion (in porous pavement)		
P101811	Construction of DN1200 overflow pipe (CH70-30)	100%	35 16-Feb-19 A	28-Mar-19 A	-		Construction of DN1200 overflow pipe (CH70-30)		
Connection	Vorks						▼ 13-Apr-19A, Connection Works		
P100330	Modification works for connection of overflow Pipe at NWK overflow chamber	100%	30 15-Feb-19A	21-Mar-19 A			Modification works for connection of overflow Pipe at NW	Coverflow chamber	
P100380	Reliability test of NWKOF	100%	14 29-Mar-19 A	13-Apr-19 A			Reliability test of NWKOF ↓ 11-Feb-19 A, Portion 1 (Weather station)		
49075	ather station) Replacement of H2S sensors and weather station	100%	1 22-Jan-19 A	22-Jan-19 A	_		Replacement of H2S sensors and weather station		
A9080	Testing and Commissioning	100%	18 22-Jan-19 A	11-Feb-19A			Testing and Commissioning		
Expert syste								▼ 14-Dec-19, Expert system	
A9090	Implementation of Phase 1 Expert System (MPS1, MPS2, )	100%	160 15-Aug-17 A	27-Feb-18 A					
A9100 A9120	Implementation of Phase 2 Expert System (SDF, Chemcial dosing and Chlorination) Training to DSD/ST2	25%	105 13-Oct-18 A 10 03-Dec-19	03-Dec-19 14-Dec-19				Implementation of Phase 2 Exp	en System (SDF, Chemici
		070	10 00 000 10	14 800 10					2
	tary Agreement No.2 Jgrading (2nd Stage)							29-Jan-20	, MPS2 Pump Ugrading (
	Manufacturing of 2nd batch of new impeller (3Nos)	100%	165 18-Sep-18 A	02-Mar-19 A			Manufacturing of 2nd batch of new impeller (3Nos)		
A9235	Delivery of 2nd batch of pump propeller (3nos)	100%	18 01-May-19 A	18-May-19 A			Delivery of 2nd batch of pump prope		
A9238	Manufacturing of 3rd and 4th batch of new impeller (2Nos)	100%	180 01-Nov-18 A	29-Apr-19 A			Manufacturing of 3rd and 4th batch of new i		
A9239 A9246	Delivery of 3rd batch of pump impeller (2nos) Delivery of 4th batch of pump impeller (2nos)	100%	45 16-Jun-19 A 45 01-Jul-19 A	31-Jul-19 A 15-Aug-19 A	_			of 3rd batch of pump impeller (2nos) ivery of 4th batch of pump impeller (2nos)	
A9248	Off site RTD repairing No. 4	100%	21 19-May-19 A	08-Jun-19 A			Off site RTD repairing No. 4		
A9251	Replacement of Dn600 Centrate valve (Hall A)	100%	21 19-May-19 A	08-Jun-19A			Replacement of Dn600 Cer	rate valve (Hall A)	
A9252	Installation and testing of upgraded pumps (3Nos)	15%	120 03-Apr-19 A	12-Dec-19				Installation and testing of up	graded pumps (3Nos)
A9262	Installation and testing of upgraded pumps (4Nos)	0%	120 02-Sep-19	30-Dec-19					ng of upgraded pumps (41
A9272	Submit performance report, O&M manual for upgrading works	0%	30 31-Dec-19	29-Jan-20				Submit pe	rformance report, O&M n
<mark>)OU3 upsizi</mark> A9310	Manufacturing and delivery of pump sets, filter media, demisters	100%	110 05-Dec-18 A	24-Mar-19 A	_		Manufacturing and delivery of pump sets, filter, media, de	nisters	× 2
A9320	Manufacturing and delivery of instruments	100%	119 05-Dec-18A	02-Apr-19 A			Manufacturing and delivery of instruments		
49330	Manufacturing and delivery of 1st FRP vessels	100%	60 20-Dec-18 A	17-Feb-19 A			Manufacturing and delivery of 1st FRP vessels		
A9340	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and sc	100%	30 22-Jan-19 A	20-Feb-19 A	_		Preparaton works for FPR vessel dismantling, including Mod of pipe		
A9350 A9360	Discommissioning and replacement of new FRP vessels	45% 5%	24 20-Mar-19 A 18 13-Apr-19 A	15-Sep-19	-			Discommissioning and replacement of new FRP vessels Replacement of recirculation pumps, nutrient pumps a	nd assigniated nineworks
49360 49370	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks Installaton of instruments	5%	15 13-Apr-19 A	02-Oct-19 29-Sep-19				Installaton of instruments	
A9380	Testing and commissioning	0%	15 02-Oct-19	17-Oct-19	1			Testing and commissioning	
49660	Manufacturing and delivery of 2nd FRP vessels	75%	45 30-Mar-19 A	13-Sep-19				Manufacturing and delivery of 2nd FRP vessels	
A9670	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and sc	0%	20 02-Oct-19	22-Oct-19	_			Preparaton works for FPR vessel dismantling,	
\9680 \9690	Discommissioning and replacement of new FRP vessels Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	24 22-Oct-19 18 15-Nov-19	15-Nov-19 03-Dec-19	-			Discommissioning and replacement of recirculation p	
19690 19700	Installation of instruments	0%	15 15-Nov-19	30-Nov-19	1			Installation of instruments	
9710	Testing and commissioning	0%	14 03-Dec-19	17-Dec-19				Testing and commissionir	g
9720	Manufacturing and delivery of 3rd FRP vessels	0%	45 23-Sep-19	07-Nov-19				Manufacturing and delivery of 3rd FRP v	
49730	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and sc	0%	25 03-Dec-19	28-Dec-19	_				FPR vessel dismantling,
49740 49750	Discommissioning and replacement of new FRP vessels Replacement of recirculation pumps, nutrient pumps and associated pineworks	0%	24 08-Dec-19	01-Jan-20 17-Jan-20					nd replacement of new F
19750 19760	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks Installaton of instruments	0%	16 01-Jan-20 14 01-Jan-20	17-Jan-20 15-Jan-20	-				
					Contract No. DC/2009	9/10			necked Appro
Act	ual Work				Contract No. DC/2009	7/10		26-Jul-18 Rev. 5	······································
	maining Work VIII Summary		HATS Stage 2A	- Upgrading wo	orks at StoneCutters Isla	and Sewage	Treatement Works	20-Nov-18 Rev. 6 11-Feb-19 Rev. 7	

Activity ID	Activity Name	Activity %		Finish	2019					
		Complete			Q4	Q1	Q2	Q3	Q4	
A9770	Testing and commissioning	0%	15 17-Jan-20	01-Feb-20						T-
A9780	Manufacturing and delivery of 4th FRP vessels	0%	45 07-Nov-19	22-Dec-19					► <b></b>	Manufacturing ar
A9790	Preparaton works for FPR vessel dismantling, including Mod of pipelines, air ducts and sc	0%	24 17-Jan-20	10-Feb-20						
A9800	Discommissioning and replacement of new FRP vessels	0%	14 27-Jan-20	10-Feb-20			L			
A9810	Replacement of recirculation pumps, nutrient pumps and assiociated pipeworks	0%	12 10-Feb-20	22-Feb-20						-
A9820	Installaton of instruments	0%	12 10-Feb-20	22-Feb-20						L=I
A9830	Testing and commissioning	0%	10 22-Feb-20	03-Mar-20						
A9840	Final testing and commissioning (including air balancing and performance test)	0%	16 03-Mar-20	19-Mar-20						
A9850	Reliability test of upgraded DOU	0%	30 19-Mar-20	18-Apr-20			L			
A9860	As-built drawings and OM manual submission and defect rectification	0%	25 19-Mar-20	13-Apr-20						
A9870	Provide Operational Training to ST2	0%	5 18-Apr-20	23-Apr-20						
A9880	Handover to ST2	0%	5 23-Apr-20	28-Apr-20						
Replacem	ent of MPS1 inlet penstock						Mar-19 A, Replacement of MPS	l inlet penstock		
2018/2019	Dry Season					▼ 17	Mar-19 A, 2018/2019 Dry Seaso	n		
A9950	Design and fabrication of temporary bulkhead in adit tunnel	100%	150 05-Mar-18 A	01-Aug-18 A	d fabrication of temporary bulkhead in adit tu	unnel				
A9980	Installation of bulkhead in two adit tunnel for isolation of MPS1	100%	14 01-Nov-18 A	14-Nov-18 A	Installation of b	bulkhead in two adit tunnel for isola	ation of MPS1			
A9985	Divert all flow to MPS2 during 2018/2019 dry season	100%	105 15-Nov-18 A	27-Feb-19 A	L=	Divert all	flow to MPS2 during 2018/2019	dry season		
A9990	Installation of two new inlet penstocks	100%	60 18-Dec-18 A	15-Feb-19 A			two new inlęt penstocks			
A9992	Electrical and control installation of two new inlet penstock	100%	9 07-Feb-19A	15-Feb-19 A		Electrical and	control installation of two new ir	let penstock		
A9994	Testing and commissioning	100%	9 16-Feb-19A	24-Feb-19 A		└ <b>►</b> Testing an	commissioning			
A9995	Dismantle of metal scaffold and final clearance	100%	7 25-Feb-19 A	03-Mar-19 A		L <b>⊢</b> ⊟ Disman	le of metal scaffold and final cle	arance		
A9996	Implementation of 3rd two weeks by-pass	100%	0 04-Mar-19 A			Impleme	ntation of 3rd two weeks by-pas	s		
A9997	Dismantling of temporary bulkhead in two adit tunnel	100%	14 04-Mar-19 A	17-Mar-19 A			mantling of temporary bulkhead	in two adit tunnel		
A9998	Resume HATS1 flow	100%	0	17-Mar-19 A		Re	sume HATS1 flow			
Feature W	all at Existing CEPT					▼ 14-Feb-19A, F	eature Wall at Existing CEPT			
A10010	Design and construction of architectural features installation	100%	300 21-Apr-18 A	14-Feb-19 A		Design and co	nstruction of architectural featur	es installation		
Existing R	iser shaft								13-Oct-19, Existing Riser	shaft
A10025	Demobilize of equipment and material in riser shaft	100%	60 18-Mar-19 A	16-May-19 A				of equipment and material in ris	ser shaft	
A10030	Cosntruction top slab of existing riser shaft	72%	150 17-May-19 A	13-Oct-19					Cosntruction top slab of e	xisting riser shaft

Actual Work	♦ ♦ Mil	lestone	Contract No. DC/2009/10	Sheet 2 of 2
Remaining Work	Su	mmary	HATS Stage 2A - Upgrading works at StoneCutters Island Sewage Treatement Works	20-N 11-F
Critical Remaining Wo	ork			11-F
			Target Works Programme for Completion of Section 3, 4 and 5	

Q3			Q4			Q1	2020	0	22
						Testing a	nd commis	sioning	
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							Replacemen	t of recircu	ation pump
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I	1 1	Cost	truction top	SIAD OF EXI	sting riser s	nan			
9	Sheet 2 of 2	2	Date	_	evision	Cr	necked	Арр	roved
		26-Jul-1 20-Nov-		Rev. 5 Rev. 6				+	
		11-Feb-		Rev. 7					