東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE

CONTRACT NO. DC/2013/10 - DESIGN, BUILD AND OPERATE SAN WAI SEWAGE TREATMENT WORKS – PHASE 1

MONTHLY EM&A REPORT NO. 19

(01 NOVEMBER – 30 NOVEMBER 2018)

Prepared by: _____
LO, Ting Yi

Certified by: _____
LAU, Chi Leung
Environmental Team Leader

Issued Date: 10 December 2018 *Report No.: ENA88738*

ANEWR

Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme
5/F, Western Magistracy
2A Po Fu Lam Road
Hong Kong

Your reference:

Our reference: HKDSD203/50/105436

Date: 18 December 2018

Attention: Mr Albert Wong

BY EMAIL & POST
(email: awong@dsd.gov.hk)

Dear Sirs

Agreement No. HATS 02/2016
Services for Independent Environmental Checker (IEC) for
Contract No. DC/2013/10 – Design, Build and Operate San Wai Sewage Treatment Works – Phase 1
Monthly Environmental Monitoring and Audit Report No.19 (November 2018)

We refer to emails of 10 and 17 December 2018 from ETS-Testconsult Limited attaching the Monthly Environmental Monitoring and Audit Report No.19 (November 2018).

We have no comment and hereby verify the Monthly Environmental Monitoring and Audit Report No.19 (November 2018) in accordance with Clause 5.4 of the Environmental Permit no. EP-464/2013.

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Nic Lam on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

Adl Lee
Independent Environmental Checker

LYMA/LHHN/FSKA/csym

cc AECOM – Mr Patrick Leung (email: patrick.leung@swstw-aecom.com)
ETS-Testconsult Limited – Mr C L Lau (email: env@ets-testconsult.com)

ANewR Consulting Limited
Unit 517, 5/F, Tower A, Regent Centre
63 Wo Yi Hop Road, Kwai Chung, Hong Kong
Tel: (852) 2618 2831 Fax: (852) 3007 8648
Email: info@anewr.com
Web: www.anewr.com

ISO 9001 : 2015
Certificate No.: CC 3988

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

FIGURES

EXECUTIVE SUMMARY

This Monthly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Stage 1 (the Project) (hereafter referred to as "the Contract"). The Contract was awarded to ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE (ADCJV) by the Drainage Services Department (DSD) and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by ADCJV to implement the EM&A program in compliance with the EP and the EM&A Manuals.

According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-464/2013, an EM&A programme should be implemented in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-072/2003). The scope of monitoring works includes air quality, construction noise, water quality and environmental site audit.

Baseline monitoring was completed in April 2017. Action and Limit Levels were established for air quality, noise and water quality parameters based on the baseline monitoring results.

This is the nineteenth Monthly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries findings of the EM&A works conducted during the reporting period from 01 November 2018 to 30 November 2018.

Site Activities

As informed by the Contractor, site activities were carried out in this reporting month:

- *Substructure (ELS & Bulk excavation);*
- *Substructure (rc structure);*
- *Backfilling;*
- *Removal of ELS;*
- *Superstructure (rc and metalworks);*
- *Water Tightness Test;*
- *Bar Screen Installation;*
- *Slope works and Retaining Wall (Eastern Portion);*
- *Slope works and Retaining Wall (Northern Portion);*
- *Drainage Inlet connection;*
- *CLP Cable Duct and Draw Pits (within the Site);*
- *EVA (Road & Drainage);*
- *Emergency By-Pass Pipe*

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the EM&A Manual for this Contract. The summary of the monitoring activities in this reporting month is listed below:

- *24-hour TSP Monitoring: 5 Occasions at 2 designated locations*
- *1-hour TSP Monitoring: 15 Occasions at 2 designated locations*
- *Noise Monitoring (Day-time): 5 Occasions at 2 designated locations*
- *Water Quality Monitoring: 13 Occasions at 1 designated location*
- *Weekly Site inspection: 5 Occasions*

Air Quality Monitoring

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

Noise Monitoring

No exceedance of Action and Limit levels for noise monitoring was recorded in the reporting month.

Water Quality Monitoring

According to the summary of water monitoring results, no exceedance of Action and Limit levels was recorded in this reporting month.

Weekly Site Inspections

In general, performance on environmental mitigation measures implemented was found to be satisfactory in this reporting month. The major findings observed during site inspections are presented in the **Section 5.0**.

Complaint Log

There was no complaint received in relation to the environmental impact during the reporting period.

Notifications of Summons and Successful Prosecutions

There were no notifications of summons or prosecutions received during the reporting period.

Reporting Change

There were no reporting changes during the reporting period.

Future Key Issues

The future key issues to be undertaken in the upcoming month are as follows:

- *Chemical and waste management;*
- *Treatment of runoff and wastewater prior to discharge; and*
- *Dust and Noise generated from construction activities*

1. INTRODUCTION

1.1. Basic Project Information

1.1.1. This Monthly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Stage 1 (the Project) (hereafter referred to as "the Contract"). The Contract was awarded to ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE (ADCJV) by the Drainage Services Department (DSD) and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by ADCJV to implement the EM&A program in compliance with the EP and the EM&A Manuals.

1.1.2. The project involves expansion of the preliminary treatment works at San Wai STW from 164,000 m^3/d to 200,000 m^3/d Average Dry Weather Flow, upgrading the preliminary treatment level to CEPT and adding centralized disinfection. The site layout plan is shown in **Appendix A**.

1.1.3. According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-464/2013, an EM&A programme should be implemented by an independent Environmental Team (ET) in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-072/2003).These documents are available through the EIA Ordinance Register. The construction works of the Contract commenced on 16 May 2017.

1.1.4. The scope of monitoring works includes air quality, construction noise, water quality and environmental site audit. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Monitoring schedules for the reporting month and forthcoming months;*
- *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.*

1.1.5. As part of the project EM&A program, baseline monitoring was conducted from 21 March 2017 to 15 April 2017 to determine the ambient environmental conditions before the project commence any major construction works and it had been verified by IEC and endorsed by EPD.

1.1.6. This is the nineteenth Monthly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries the audit findings of the EM&A programme during the reporting period from 01 November 2018 to 30 November 2018.

1.2. Project Organization

1.2.1. The project organization structure and lines of communication with respect to the on-site environmental management structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1.**

Table 1.1 Contact Information of Key Personnel

Party	Position	Name of Key Staff	Tel. No.	E-mail
Supervising Officer (AECOM Asia Co. Ltd.)	Resident Engineer	Mr. Patrick Leung	5222 6561	patrick.leung@swstw-aecom.com
Independent Environmental Checker (ANewR Consulting Limited)	Technical Director	Mr. Adi Lee	2618 2836	aymlee@anewr.com
	Senior Environmental Consultant	Mr. Nic Lam	2618 2836	nhhlam@anewr.com
Contractor (ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE)	Environmental Officer	Mr. Johnny So	9513 8899	johnny.so@c302.chechk.com
Environmental Team (ETS-Testconsult Ltd.)	Environmental Team Leader	Mr. C. L. Lau	2946 7791	env@ets-testconsult.com

1.3. Construction Programme

1.3.1. A copy of the Contractor's construction programme is provided in **Appendix C**.

1.4. Construction Works Undertaken During the Reporting Period

1.4.1. A summary of the construction activities undertaken during this reporting period is shown below:

- *Substructure (ELS & Bulk excavation);*
- *Substructure (rc structure);*
- *Backfilling;*
- *Removal of ELS;*
- *Superstructure (rc and metalworks);*
- *Water Tightness Test;*
- *Bar Screen Installation;*
- *Slope works and Retaining Wall (Eastern Portion);*
- *Slope works and Retaining Wall (Northern Portion);*
- *Drainage Inlet connection;*
- *CLP Cable Duct and Draw Pits (within the Site);*
- *EVA (Road & Drainage);*
- *Emergency By-Pass Pipe*

2. AIR QUALITY MONITORING

2.1. Monitoring Requirements

2.1.1. 1-hr and 24-hr TSP levels were monitored in the reporting month in accordance with the EM&A Manual. Two air monitoring locations were selected which was shown in **Figure 1**.

2.2. Monitoring Equipment

1-hour TSP Monitoring

1-hour TSP levels were measured by using dust meter which are capable of producing comparable results as the by high volume sampling method, to indicate short event impacts. The dust meter is compliant to the clause 1.2.5 of "General Technical Requirement of Environmental Monitoring" and clause 2.2 of "Generic Environmental Monitoring and Audit Manual".

Table 2.1 summarized the dust meter model used during the baseline monitoring. Copies of calibration certificates for dust meters were attached in **Appendix D1**.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Model
Dust Meter	SIBATA LD-3B / SIBATA LD-5
High volume sampler (HVS)	Greasby GMW (GS2310)
Calibrator	Tisch TE-5025A

1-hr air quality monitoring (Dust Meter)

Measuring Procedures

The measuring procedures of the dust meter are in accordance with the Manufacturer's instruction Manual as follows:

- Press POWER to ON, check the battery indicator to ensure whether the power supply is enough to conduct the TSP monitoring;
- Press TIMER SET to Manual;
- Press START/STOP SWITCH to start the TSP monitoring;
- Press START/STOP SWITCH to stop the TSP monitoring after monitoring complete;
- Record measured COUNT directly from the dust meter and calculate the TSP level by using the equation of the certificate.

Maintenance & Calibration (QA/QC)

- Dust meter should be checked at 3-month intervals and calibrated at half-year intervals throughout all stages of air quality monitoring.

24-hr air quality monitoring (HVS)

Instrumentation

High volume sampler, as HVS, (Greasby GMWS2310) complete with appropriate sampling inlets were employed for both 1-hour and 24-hour TSP monitoring. The sampler is composed 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).

Installation

The installation of HVS refers to the requirement stated in EM&A Manual.

Operation/Analytical Procedures

Operating/analytical procedures for the operation of HVS are as below:

- Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 0.6m^3/min and 1.7m^3/min.) in accordance with the manufacturer's

instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. The flow rate was indicated on the flow rate chart.

- For TSP sampling, fiberglass filters (Whatman G653) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The programmable timer will be set for a sampling month of 1 hour or 24 hours. 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 transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in desiccators for 24 hour with the temperature of 25^{o}C $\pm$ 3^{o}C and the relative humidity (RH) <50% $\pm$5%.

Maintenance & Calibration (QA/QC)

- HVS and their accessories should be maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVS should be calibrated at bi-monthly intervals.

Wind Data Monitoring

Wind data (wind speed and wind direction) were directly extracted from Wetland Park Station of Hong Kong Observatory. All wind data during this reporting month are shown in **Appendix G**.

2.3. Monitoring Parameters, Frequency and Duration

2.3.1. **Table 2.2** summarizes the monitoring parameters, monitoring duration and frequencies of impact air quality monitoring.

Table 2.2 Monitoring Parameters, Duration and Frequencies of Impact Air Quality Monitoring

Parameter	Duration	Frequency
1-hr TSP	1 hr (0800-1900)	Three times per 6 days
24-hr TSP	24 hr	Once per 6 days

2.3.2. In this reporting period, a total of 15 occasions of 1-hour TSP monitoring and 5 events of 24-hour TSP monitoring were undertaken and the schedule was shown in **Table 2.3**

Table 2.3 Time Schedule of Impact Air Quality Monitoring

November 2018						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 ▼	3
4	5	6	7	8 ▼	9	10
11	12	13	14 ▼	15	16	17
18	19	20 ▼	21	22	23	24
25	26 ▼	27	28	29	30	

Remark: (▼) = Air quality monitoring carried out by ET

2.4. Action and Limit Levels

The criteria for Action and Limit levels have been set out in the contract document of the Project as follows:

Table 2.4 The criteria of Action and Limit Levels for Air Quality

Parameters	Action	Limit
1-hour TSP Level ($\mu g/m^3$)	For baseline level $\leq$ 384$\mu g/m^3$, Action level = (baseline level plus*1.3 + Limit Level) / 2	500 $\mu g/m^3$
	For baseline level >384$\mu g/m^3$, Action level = Limit Level	
24-hour TSP Level ($\mu g/m^3$)	For baseline level < 200$\mu g/m^3$, Action level = (baseline level plus*1.3 + Limit Level) / 2	260 $\mu g/m^3$
	For baseline level $\geq$ 200$\mu g/m^3$, Action level = Limit Level	

Following the criteria shown in **Table 2.4**, the Action and Limit levels for 1-hour TSP derived as illustrated in **Table 2.5**.

Table 2.5 Action and Limit Levels for 1-hour TSP and 24-hour TSP

Air Quality Monitoring Station	1-hr TSP ($\mu g/m^3$)		24-hr TSP ($\mu g/m^3$)	
	Action Level	Limit Level	Action Level	Limit Level
ASR1a	309	500	260	260
ASR2b	292	500	228	260

2.5. Results and Observations

2.5.1. 1-hour and 24-hour TSP Monitoring Results

Monitoring data of both 1-hour and 24-hour TSP monitoring carried out in this reporting month are summarized in **Appendix D2**. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting month is shown in **Appendix D3**. Wind data included wind speed and wind direction was extracted from Wetland Park Station of Hong Kong Observatory during this reporting month and is presented in **Appendix G**.

No exceedance of Action and Limit Level of 1-hr TSP and 24-hour TSP monitoring results was recorded during the reporting month.

2.5.2. Observation

Generally, 1-hour TSP and 24-hour TSP monitoring results fluctuated well below the Action Level in this reporting period. The major dust source observed near the monitoring stations was mainly from vehicles passing by the container yards and general earth works. It can be concluded that the contractor implemented sufficient dust mitigation measures during this reporting month.

2.6. Event and Action Plan

If the impact monitoring results exceed the Action and Limit Levels, the actions specified in **Table 2.6** shall be carried out.

Table 2.6 Event and Action Plan for Air Quality (Dust) during Construction Phase

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded for one sample	1. Identify source; 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.
Action Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. 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 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 are properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level being exceeded for one sample	1. Identify source; 2. Inform IEC, ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures;	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	effectiveness of Contractor's remedial actions; 8. Keep EPD and ER informed of the results.	6. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly.	IEC and Contractor on potential remedial actions; 4. Ensure remedial actions properly implemented.	proposals; 4. Amend proposal if appropriate.
Limit Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC, ER and EPD the causes & actions taken for the exceedances; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss with IEC and the Contractor on potential remedial actions; 5. Review Contractor's remedial actions whenever necessary to assure their effectiveness; 6. 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not resolved; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

3. NOISE MONITORING

3.1. Monitoring Requirements

3.1.1. Noise levels (L_{eq}, L_{10} and L_{90}) were monitored in the reporting month in accordance with the EM&A Manual.

3.2. Monitoring Equipment

Sound level meters used for impact noise monitoring were Type 1 sound level meters capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (Lx). They complied with International Electro technical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 3.1** summarized the noise monitoring equipment model used during the baseline monitoring. Copies of calibration certificates for noise meters and calibrators were attached in **Appendix E1**.

Table 3.1 Noise Monitoring Equipment

Noise Monitoring Equipment	Model
Sound Level Meter	Rion NL-31 / Rion NL-52
Sound Level Calibrator	Castle GA607 / Rion NC-73

3.3. Monitoring Duration and Frequency

3.3.1. Impact noise monitoring for the A-weighted levels L_{eq}, L_{10} and L_{90} in 30-minute interval was recorded once per 6 days.

3.3.2. In this reporting period, a total of 5 occasions of noise monitoring were undertaken and the schedule was shown in **Table 3.2**

Table 3.2 Time Schedule of Impact Noise Monitoring

November 2018						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 ▼	3
4	5	6	7	8 ▼	9	10
11	12	13	14 ▼	15	16	17
18	19	20 ▼	21	22	23	24
25	26 ▼	27	28	29	30	

Remark: (▼) = Noise monitoring carried out by ET

3.4. Monitoring Locations

Two noise monitoring stations, NSR1a (晉榮貨櫃服務有限公司) and NSR2b (永康貨櫃服務有限公司) which shown in **Figure 1**, were required to perform impact noise monitoring during this reporting peroid.

The impact noise monitoring programme was summarized in **Table 3.3**.

Table 3.3 Noise Monitoring Stations

Noise monitoring station	Type of Measurement
NSR1a	Façade
NSR2b	Façade

3.5. Monitoring Methodology

Instrumentation

Integrating Sound Level Meters were employed for noise monitoring.

Operation/Analysis Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct 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
  - Time measurement : 30 mins
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- During the monitoring period, the L_{eq}, L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- 3dB(A) correction had been added to the results if noise measurements were free-field.
- Noise monitoring would be cancelled in the presence of fog, rain, storm, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

Maintenance and Calibration (QA/QC)

- The microphone head of the sound level meter and calibrator are cleaned with soft cloth at quarterly intervals.
- The meters are sent to the HOKLAS accredited laboratory or equivalent to check and calibrated at yearly intervals.

3.6. Actions and Limit Level

The Action and Limit Levels were established in **Table 3.4** for noise monitoring.

Table 3.4 Action and Limit Levels for Noise Monitoring

Time Period	Action	Limit
0700 –1900 hrs normal weekdays	When one documented complaint is received	75 dB(A)*

Remark: (*)70dB(A) for schools and 65dB(A) for schools during school examination period

3.7. Results and Observations

3.7.1. Results

Monitoring data of noise monitoring carried out in this reporting month are summarized in **Appendix E2**. Graphical presentation of noise monitoring results for the reporting month is shown in **Appendix E3**.

No exceedance of Action and Limit Level of noise monitoring results was recorded during the reporting month.

3.7.2. Observation

The noise monitoring data were found to be lower than the limit level. The major noise source during the monitoring event was the vehicles passing through the container yard entrance and the general earth works inside the construction site.

3.8. Event and Action Plan

If the impact monitoring results exceed the Action and Limit Levels, the actions specified in **Table 3.5** shall be carried out.

Table 3.5 Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC and Contractor; 4. Discuss with the Contractor and formulate remedial measures ; 5. Increase monitoring frequency to check the effectiveness of mitigation measures.	1. Review the analyzed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure mitigation measures are properly implemented.	1. Submit noise mitigation proposal to IEC; 2. Implement noise mitigation proposals.
Limit level	1. Notify IEC, ER, EPD & Contractor; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;	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; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure mitigation measures are properly implemented; 5. If exceedances continues, consider what portion of the work is responsible and instruct the Contractor	1. Undertake 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 control; 5. Stop the relevant portion of works as determined by ER, until the

	7. Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.		to stop that portion of work until the exceedance is abated.	exceedance is abated.

4. WATER QUALITY MONITORING

4.1. Monitoring Requirements

4.1.1. Water quality was monitored in the reporting month in accordance with the EM&A Manual at one alternative water quality monitoring station, R1b (at Tin Shui Wai Nullah) which shown in **Figure 2.**

4.2. Monitoring Methodology and Equipment

For In-situ Water Quality Measurement

Dissolved Oxygen (DO) measuring equipment

A portable, weatherproof DO-measuring meter with built-in salinity compensation (e.g. YSI 85, YSI Pro 2030 or equivalent) was used in the baseline monitoring. It can be capable for measuring dissolved oxygen level in the range of 0-20 mg/L and 0-200 % saturation.

For Water Sampling and Sample Analysis

Water Sampler

A water sampler comprising a metal bucket was lowered into the water body.

Water Container

The sample container, made by high-density polythene, was rinsed with a portion of the water sample. The water sample was then transferred to the container, labelled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4^{o}C. The water samples will then be delivered to Environmental Laboratory of ETS-Testconsult Ltd (HOKLAS Registration No. 022) on the same day for analysis according to the Standard Method APHA 19ed.

The summary of testing methods of testing parameters required was shown in **Table 4.1**.

Table 4.1 Summary of Testing Procedures for water samples

Parameters	Testing Procedure	Detection Limit
Turbidity	Dissolved Oxygen Meter Measurement	0.1 NTU
Dissolved Oxygen	In house method refer to APHA 19th ed 2130 B	0.01 mg/L
Total suspended solids	In house method refer to APHA 19th ed 2540D	0.1 mg/L

4.3. Monitoring Frequency

4.3.1. Water samples were collected 3 times per week in 1 monitoring station. Three parameters including turbidity, dissolved oxygen and total suspended solids would be tested.

Table 4.2 Monitoring Frequency of Water Quality Monitoring

Parameters	Frequency	No. of sampling stations
Turbidity	3 times per week	1 station
Dissolved Oxygen		
Total suspended solids		

4.3.2. In this reporting period, a total of 13 occasions of water quality monitoring were undertaken and the schedule was shown in **Table 4.3**

Table 4.3 Time Schedule of Impact Water Quality Monitoring

November 2018						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 ▼	2	3 ▼
4	5	6 ▼	7	8 ▼	9	10 ▼
11	12	13 ▼	14	15 ▼	16	17 ▼
18	19	20 ▼	21	22 ▼	23	24 ▼
25	26	27 ▼	28	29 ▼	30	

Remark: (▼) = Water quality monitoring carried out by ET.

4.4. Quality Assurance (QA) / Quality Control (QC)

For in-situ measurements, at each measurement / sampling, two consecutive measurements of turbidity and dissolved oxygen (DO) were taken. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. If the difference between the first and second measurement is greater than 25% the reading will be discarded and the measurements will be repeated.

For laboratory analysis of water, test method of all test parameters and the QA/QC samples were carried out in accordance with the requirements of HOKLAS.

For our QA/QC procedure, one QC sample, one duplicate sample and one sample spike of every batch of 20 samples were analyzed.

The calibration certifications of water quality monitoring equipments were shown in **Appendix F1**.

4.5. Actions and Limit Levels

The criteria for Action and Limit Levels have been set out as follows:

Table 4.4 The criteria of Action and Limit Levels for Water Quality

Parameters	Unit	Action Level	Limit Level
Turbidity	NTU	95%ile of baseline data	99%ile of baseline data
Dissolved Oxygen	mg/L	5%ile of baseline data	1%ile of baseline data
Suspended solids	mg/L	95%ile of baseline data	99%ile of baseline data

Following the criteria shown in **Table 4.4**, the Action and Limit Levels for monitoring parameters derived as illustrated in **Table 4.5**.

Table 4.5 Action and Limit Levels for Water Quality

Parameters	Unit	Action	Limit
Turbidity	NTU	19.8	20.5
Dissolved Oxygen	mg/L	1.84	1.81
Suspended Solid	mg/L	17.0	17.8

4.6. Result and Observation

4.6.1. Result

Monitoring data of water quality monitoring carried out in this reporting month are summarized in **Appendix F2**. Graphical presentation of the monitoring results for the reporting month is shown in **Appendix F3**.

No exceedance of Action and Limit Level of water quality monitoring results was recorded during the reporting month.

4.6.2. Observation

Generally, the turbidity and suspended solids were found to be lower than the action level. Besides, all results of dissolved oxygen measured in this reporting month were higher than the action level.

4.7. Event and Action Plan

If the impact monitoring results of the individual parameters exceed the Action and Limit Levels, the actions specified in **Table 4.6** shall be carried out.

Table 4.6 Event and Action Plan for Water Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
	Contractor; 6. Repeat measurement on next day of exceedance.			measures.
Action Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact;	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
	3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures.	plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation

Event	Action			
	ET Leader	IEC	ER	Contractor
	mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.		Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	measures; 7. As directed by the ER, to slow down or to stop all or part of the marine work or construction activities.

5. ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1. Site Inspection

5.1.1. Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the project. During the reporting period, site inspections were carried out on 02, 09, 16, 22 & 30 November 2018.

5.1.2. Observations for the site inspections within this reporting period are summarized in **Table 5.1** and inspection checklists are attached in **Appendix H**.

Table 5.1 Summary of observation of site inspections

Date	Observations/ Reminders	Follow-up Action	Closed Date
25 October 2018	1. Stagnant water was found accumulated on the road near SDB.	1. Stagnant water and oil were cleaned inside the chemical container near UV Zone.	02 November 2018
02 November 2018	1. General refuse was observed at SDB & UV area.	1. General refuse was collected at SDB & UV area.	09 November 2018
09 November 2018	--	--	--
16 November 2018	1. Damaged drip tray with oil stain for a generator was observed at P1.	1. oil stain was cleared and stopper was provided for the drip tray.	22 November 2018
22 November 2018	--	--	--
30 November 2018	1. Dust emission was observed on the site. 2. Stagnant water was observed inside the drip tray near P1 area.	Follow-up actions for outstanding observation will be inspected during the next site inspection.	--

5.2. Landscape and Visual Audit

5.2.1. Landscape and visual audits were undertaken at least once every two weeks throughout the construction period by a competent landscape architect. During the reporting period, audits were carried out on 02, 16 and 30 November 2018.

5.2.2. Observations and reminders were summarized in the landscape and visual impact assessment checklists which are attached in **Appendix I**.

5.3. Advice on the Solid and Liquid Waste Management Status

5.3.1. All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil

5.3.2. The quantities of waste for disposal in this Reporting Period are summarized in **Table 5.2** and **Table 5.3** and the Monthly Summary Waste Flow Table is shown in **Appendix J**. Whenever possible, materials were reused on-site as far as practicable.

Table 5.2 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
Reused in this Contract (Inert) (m^3)	0	--
Reused in other Projects (Inert) (m^3)	0	--
Disposed as Public Fill (Inert) (m^3)	1,682	Tuen Mun 38 Fill Bank

Table 5.3 Summary of Quantities of C&D Materials

Type of Waste	Quantity	Disposal Location
Recycled Metal (kg)	2	--
Recycled Paper / Cardboard Packing (kg)	250	--
Recycled Plastic (kg)	0	--
Chemical Wastes (kg)	0	--
General Refuses (m^3)	42,940	North East New Territories (NENT) Landfill

5.3.3. To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

5.4. Discharge License and Results of Effluent Monitoring

5.4.1. Effluent quality was monitored in the reporting month in accordance with the EM&A Manual at the discharge point. A discharge license under Water Pollution Control Ordinance was obtained by the Contractor upon commencement of the Project. Self-monitoring would be performed as per the requirement under the discharge license. According to the EM&A Manual, pH, chemical oxygen demand and total suspended solid are required to be analysed at least once every two week.

5.4.2. Effluent water samples were scheduled to be collected on 13 and 27 November 2018. During 13 November 2018, Wetsep at P1a, P1b and P8 were operated, the effluent water sample was sampled at P1a, P1b and P8. During 27 November 2018, only Wetsep at P1b was operated, the effluent water sample was sampled at P1b only. The required testing parameter including pH, chemical oxygen demand and total suspended solid were carried out in a HOKLAS laboratory. The methods of

chemical oxygen demand and total suspended solid determination follow APHA 19ed 5220 B and APHA 19ed 2540 D respectively. The laboratory reports for the discharge water are presented in **Appendix N**.

5.4.3. For effluent quality monitoring as per the discharge license requirement, the results complied with the discharge license requirement.

5.5. Environmental Licenses and Permits

5.5.1. The valid environmental licenses and permits during the reporting period are summarized in **Appendix K**.

5.6. Implementation Status of Environmental Mitigation Measures

5.6.1. The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise, water and waste and they are summarized as following:

Dust Mitigation Measures

a. The working area for the uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;
b. All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition;
c. Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point;
d. 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 hardcores;
e. Where a site boundary adjoins a road, street, service and or other area accessible to the public, hoarding of not less than 2.4m from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit;
f. Every main haul road (i.e. any course inside a construction site having a vehicle passing rate of higher than 4 in any 30 minutes) should be paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;
g. The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials;
h. Immediately before leaving a construction site, every vehicle should be washed to remove any dusty materials from its body and wheels;
i. Where a vehicle leaving a construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
j. The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;
k. Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabilizer within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;
l. Any stockpile of dusty material should be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.

Noise Mitigation Measures

a. Quiet plants should be used in order to reduce the noise impacts to protect the nearby NSRs.
b. Temporary and Movable Noise Barriers should be used in order to reduce the noise impact to the surrounding sensitive receivers

c. The contractor should site noisy equipment and activities as far from sensitive receivers as practical.
d. Idle equipment should be turned off or throttled down.
e. Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided
f. Construction plant should be properly maintained and operated.

Water Quality Mitigation Measures

a. Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;
b. The exposed soil surfaces should also be properly protected to minimize dust emission;
c. The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;
d. Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;
e. Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;
f. A discharge license needs to be applied from EPD for discharging effluent from the construction site;
g. The treated effluent quality is required to meet the requirements specified in the discharge license;
h. Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;
i. A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;
j. Illegal disposal of chemicals should be strictly prohibited;
k. Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;
l. 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 should be used as a guideline for handing chemical wastes;
m. The impact from accidental spillage of chemicals can be effectively controlled through good management practices.

Waste Management Mitigation Measures

a. 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;
b. To encourage collection of aluminium cans by individual collectors, separate bins should be provided to segregate this waste from other general refuse generated by the workforce;
c. Any unused chemicals or those with remaining functional capacity should be recycled;
d. Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste as fill material to minimize the quantity of waste to be disposed of to landfill;
e. Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and
f. Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

5.6.2. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in **Appendix L**. Most of the necessary mitigation measures were implemented properly. Any deficiencies were noted in the remarks of the schedule.

5.7. Summary of Exceedance of the Environmental Quality Performance Limit

5.7.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2b during this reporting month.

5.7.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2b during the reporting period.

5.7.3. There was no Action and Limit Level exceedance for water quality monitoring recorded at station R1b during the reporting period.

5.8. Summary of Complaints, Notification of Summons and Successful Prosecution

5.8.1. There were no complaints received during the reporting period.

5.8.2. There were no notifications of summons or prosecutions received during the reporting period.

5.8.3. A summary of environmental complaints, notifications of summons and successful prosecutions was given in **Table 5.4**.

Table 5.4 Summary of Environmental Complaints Notification of Summons and Successful Prosecution

Reporting Period	Cumulative Statistic		
	Complaints	Notifications of summons	Successful prosecutions
The reporting period	0	0	0
From commencement date of construction to end of reporting month	0	0	0

6. FUTURE KEY ISSUES

6.1. Construction Programme for the Coming Months

6.1.1. As informed by the Contractor, the major construction activities for December 2018 are included:

- *Substructure (rc structure);*
- *Substructure (ELS & Bulk excavation);*
- *Backfilling;*
- *Superstructure (rc and metalworks);*
- *Water Tightness Test;*
- *Internal ABWF – CEPT;*
- *Removal of ELS;*
- *ABWF - Administration Building & Maintenance Workshop;*
- *Piling Foundation;*
- *Bar Screen Installation;*
- *Slope works and Retaining Wall (Eastern Portion);*
- *Slope works and Retaining Wall (Northern Portion);*
- *Drainage Inlet connection (Diversion of Three Existing Sewage Rising Mains);*
- *CLP Cable Duct and Draw Pits (within the Site);*
- *EVA (Road & Drainage);*
- *RC Trench and Odour Pipe (DO1, DO2);*
- *Emergency By-Pass Pipe*

6.2. Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- *Chemical and waste management;*
- *Treatment of runoff and wastewater prior to discharge; and*
- *Dust and Noise generated from construction activities;*

Mitigation measures to be required in the coming month:

Air Quality Impact

- To provide adequate water spraying in the worksite;
- To operate and maintain automatic wheel washing facilities properly;
- To provide road sweeping site entrance and public roads outside site entrance;
- To ensure implementation of the dust mitigation measures for the site activities;
- To maintain proper operation of the mist spraying system;
- To provide proper maintenance for vehicles and machines on site; and
- To investigate any other dust sources around the air sensitive receivers

Noise

- To switch off equipment if not in use;
- To operate silent equipment;
- To identify the noise sources inside and outside of the site; and
- To follow up any exceedance caused by the construction work inside the worksite

Water Quality Impact

- To ensure the drainage system was maintained properly;
- To maintain the existing silt trap to ensure good efficiency of wheel wash facilities;
- To avoid stagnant water in the drip trays due to rainfall;
- To avoid any stagnant water or provide insecticide to avoid mosquito breeding

Chemical and Waste Management

- To remove waste from the site regularly;
- To properly store and handle chemical wastes on site;
- To implement trip ticket system for all the imported public fill and general refuse disposal;
- To maintain proper housekeeping;
- To identify C&D material by packaging, labelling, storage, transportation and disposal in accordance with statutory regulations.

6.3. Environmental Monitoring and Site Inspection Schedule for the Coming Month

6.3.1. The tentative schedule for environmental monitoring and site inspection schedule for December 2018 is provided in **Appendix M**.

7. CONCLUSION

7.1. Conclusions

7.1.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2b during this reporting month.

7.1.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2b during the reporting period.

7.1.3. There was no Action and Limit Level exceedance for water quality monitoring recorded at station R1b during the reporting period.

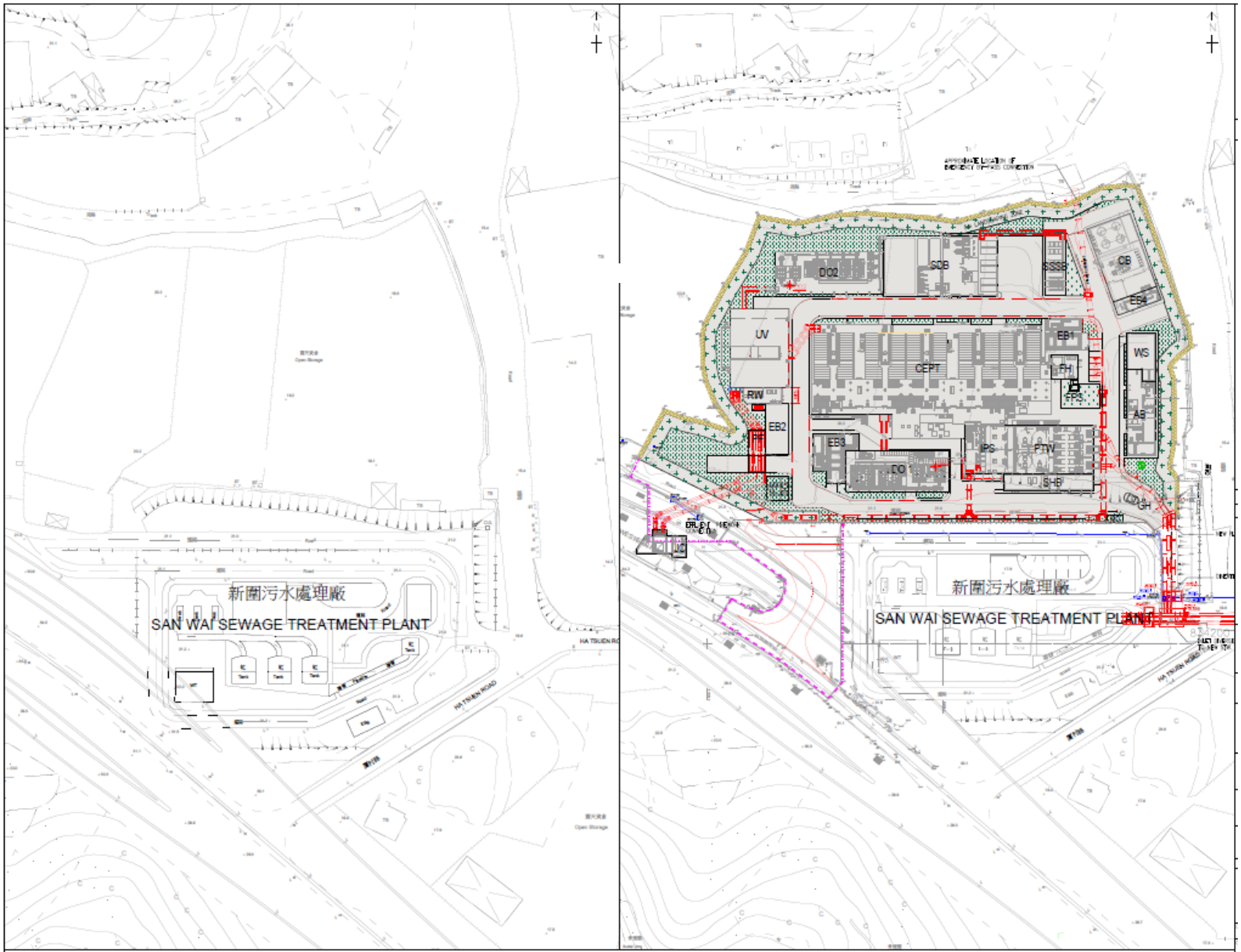
7.1.4. There were no complaints received during the reporting period.

7.1.5. There were no notifications of summons or prosecutions received during the reporting period.

- END OF REPORT -

Appendix A

Location of Works Areas

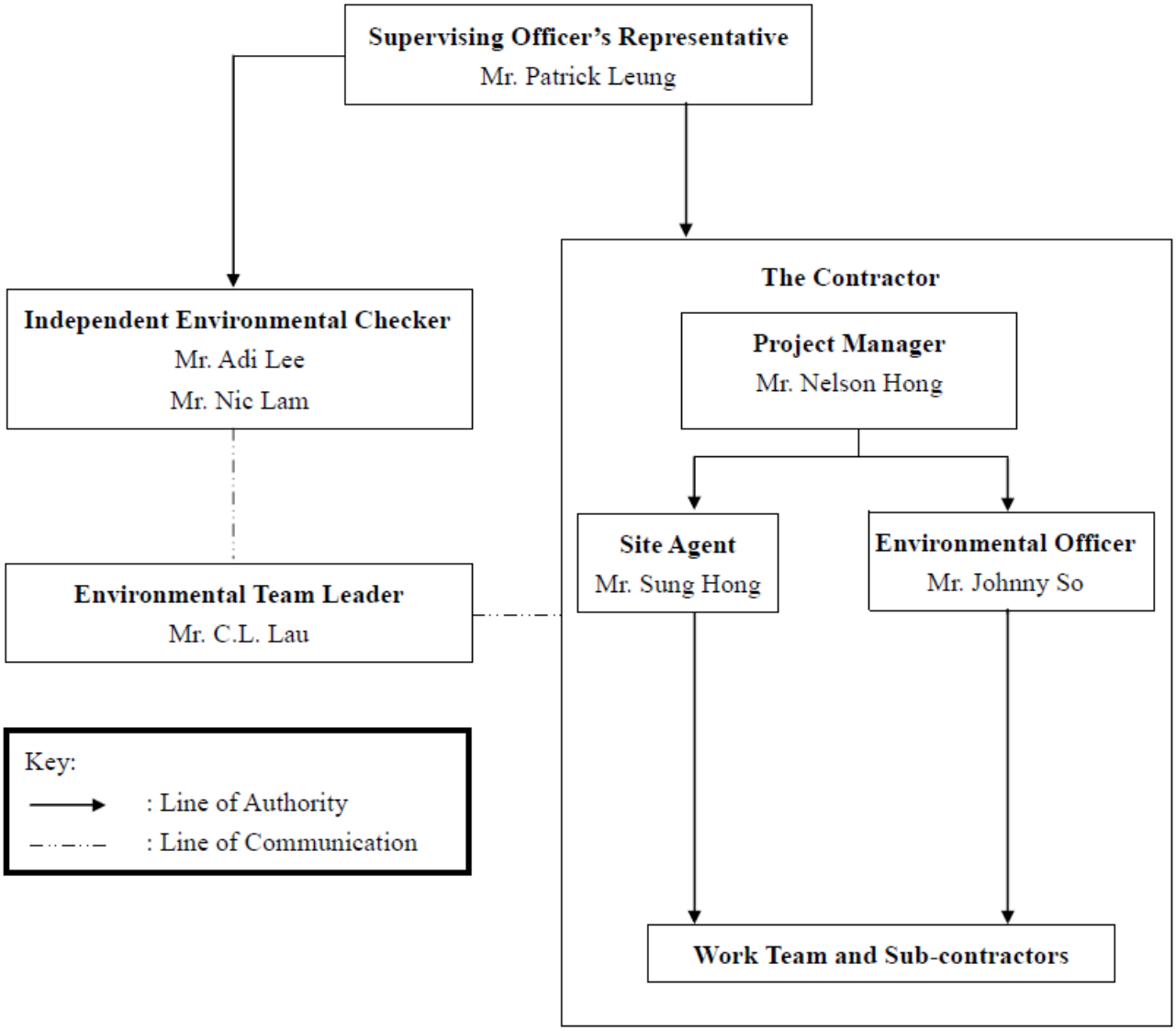


EXISTING SAN WAI SEWAGE TREATMENT WORKS

EXPANDED AND UPGRADED SAN WAI SEWAGE TREATMENT WORKS

Appendix B

Project Organization Chart

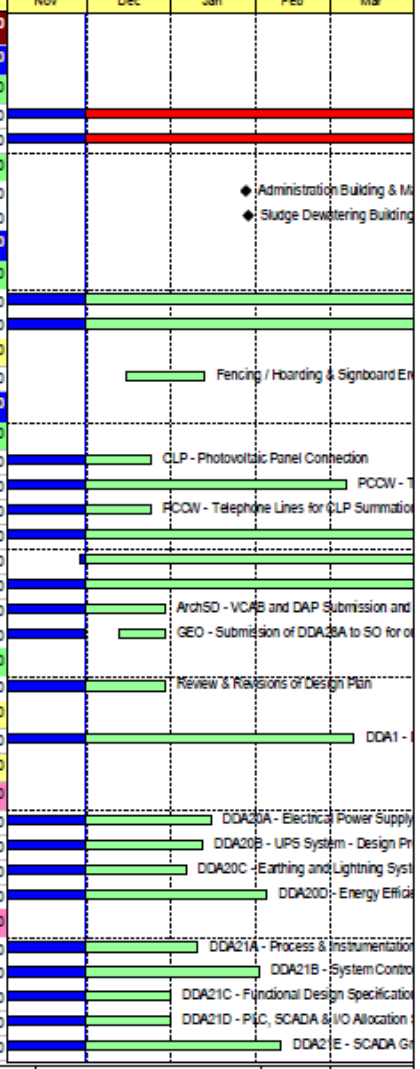

Supervising Officer's Representative
Mr. Patrick Leung
Independent Environmental Checker
Mr. Adi Lee
Mr. Nic Lam
Environmental Team Leader
Mr. C.L. Lau
The Contractor
Project Manager
Mr. Nelson Hong
Site Agent
Mr. Sung Hong
Environmental Officer
Mr. Johnny So
Work Team and Sub-contractors
Key:
: Line of Authority
: Line of Communication

Appendix C

Construction Programme

DATA DATE: 30-Nov-18 | LAYOUT: 5W Project PHase 1 Rev 10 (3M 30Nov18) | PAGE 1 OF 10

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
San Wai Sewage Treatment Works Phase 1 - Rev 10 MP (Update as of 30 Nov 2018)		**1672**	**27-May-16 A**	**23-Dec-20**	**27-May-16**	**23-Dec-20**	**0**	**0**
Key Date		**1672**	**27-May-16 A**	**23-Dec-20**	**27-May-16**	**23-Dec-20**	**0**	**0**
Commencement & Completion of Works		1672	27-May-16 A	23-Dec-20	27-May-16	23-Dec-20	0	0
KD150	Section 1 - Handover to Home Affairs Department for Maintenance	1120	30-Nov-17 A	23-Dec-20	30-Nov-17	23-Dec-20	0	0
KD160	Section 2 - Period of Works (FOT P.3 cl 67, 71) - Including 88.5 Days Granted EOT	1672	27-May-16 A	23-Dec-20	27-May-16	23-Dec-20	0	0
Plant Room Handover Dates To E&M Installation		1	28-Jan-19	29-Jan-19	28-Jan-19	29-Jan-19	0	0
KD300	Administration Building & Maintenance Workshop (AB & WS)	0		28-Jan-19		28-Jan-19	0	0
KD314	Sludge Dewatering Building (SDB)	0		29-Jan-19		29-Jan-19	0	0
Preliminaries & General Requirement		**1362**	**01-Apr-17 A**	**22-Dec-20**	**01-Apr-17**	**22-Dec-20**	**0**	**0**
Contractor Requirement		1362	01-Apr-17 A	22-Dec-20	01-Apr-17	22-Dec-20	0	0
PS465	Impact Monitoring	1275	27-Jun-17 A	22-Dec-20	27-Jun-17	22-Dec-20	0	0
PS485	Site Drainage Plan Implementation	1362	01-Apr-17 A	22-Dec-20	01-Apr-17	22-Dec-20	0	0
Contractor Requirement for Working Area Portion (P8)		30	15-Dec-18	13-Jan-19	15-Dec-18	13-Jan-19	0	0
PS160	Fencing / Hoarding & Signboard Erection (P8)	30	15-Dec-18	13-Jan-19	15-Dec-18	13-Jan-19	0	0
Design & Design Checking of Permanent Works		**1639**	**26-Jun-16 A**	**20-Dec-20**	**26-Jun-16**	**20-Dec-20**	**0**	**0**
Statutory Submission		1377	15-Mar-17 A	20-Dec-20	15-Mar-17	20-Dec-20	0	0
DS166	CLP - Photovoltaic Panel Connection	366	24-Dec-17 A	24-Dec-18	24-Dec-17	24-Dec-18	0	0
DS173	PCCW - Telephone Lines and Megalink	618	27-Jun-17 A	06-Mar-19	27-Jun-17	06-Mar-19	0	0
DS174	PCCW - Telephone Lines for CLP Summation Metering	515	28-Jul-17 A	24-Dec-18	28-Jul-17	24-Dec-18	0	0
DS177	EMSD - Passenger Lift	326	29-May-18 A	19-Apr-19	29-May-18	19-Apr-19	0	0
DS180	EPD - Application for Emergency Generator Flue Gas Discharge License	180	28-Nov-18 A	27-May-19	28-Nov-18	27-May-19	0	0
DS195	BEAM Plus - Final Assessment (FA)	1026	01-Mar-18 A	20-Dec-20	01-Mar-18	20-Dec-20	0	0
DS200	ArchSD - VCAB and DAP Submission and Approval	655	15-Mar-17 A	29-Dec-18	15-Mar-17	29-Dec-18	0	0
DS230	GEO - Submission of DDA28A to SO for onward submission to GEO for Checking Certificate	514	03-Aug-17 A	29-Dec-18	03-Aug-17	29-Dec-18	0	0
AIP / DDA Submission & Approval		987	26-Jun-16 A	09-Mar-19	26-Jun-16	09-Mar-19	0	0
DS410	Review & Revisions of Design Plan	917	26-Jun-16 A	29-Dec-18	26-Jun-16	29-Dec-18	0	0
Design Memorandum (AIP1 / DDA1)		301	13-May-18 A	09-Mar-19	13-May-18	09-Mar-19	0	0
DS505	DDA1 - Design Memorandum - Design Preparation to SO Approval	301	13-May-18 A	09-Mar-19	13-May-18	09-Mar-19	0	0
Global Design		793	06-Jan-17 A	09-Mar-19	06-Jan-17	09-Mar-19	0	0
Electrical Power Supply System (AIP20 / DDA20ABCDE)		653	24-Apr-17 A	05-Feb-19	24-Apr-17	05-Feb-19	0	0
DG1891	DDA20A - Electrical Power Supply System - Design Preparation to SO Approval	632	24-Apr-17 A	15-Jan-19	24-Apr-17	15-Jan-19	0	0
DG3880	DDA20B - UPS System - Design Preparation to SO Approval	629	24-Apr-17 A	12-Jan-19	24-Apr-17	12-Jan-19	0	0
DG3896	DDA20C - Earthing and Lightning System - Design Preparation to SO Approval	623	24-Apr-17 A	06-Jan-19	24-Apr-17	06-Jan-19	0	0
DG3912	DDA20D - Energy Efficiency - Design Preparation to SO Approval	653	24-Apr-17 A	05-Feb-19	24-Apr-17	05-Feb-19	0	0
Control and Monitoring System (AIP21 / DDA21ABCDE)		760	12-Jan-17 A	10-Feb-19	12-Jan-17	10-Feb-19	0	0
DG1924	DDA21A - Process & Instrumentation Diagram (P&ID) - Design Preparation to SO Approval	729	12-Jan-17 A	10-Jan-19	12-Jan-17	10-Jan-19	0	0
DG1940	DDA21B - System Control Philosophy - Design Preparation to SO Approval	685	20-Mar-17 A	02-Feb-19	20-Mar-17	02-Feb-19	0	0
DG1956	DDA21C - Functional Design Specification - Design Preparation to SO Approval	638	03-Apr-17 A	31-Dec-18	03-Apr-17	31-Dec-18	0	0
DG1972	DDA21D - PLC, SCADA & I/O Allocation Schedules - Design Preparation to SO Approval	618	23-Apr-17 A	31-Dec-18	23-Apr-17	31-Dec-18	0	0
DG1988	DDA21E - SCADA Graphic Interface - Design Preparation to SO Approval	590	01-Jul-17 A	10-Feb-19	01-Jul-17	10-Feb-19	0	0



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

ATAL-Degremont-China Harbour Joint Venture

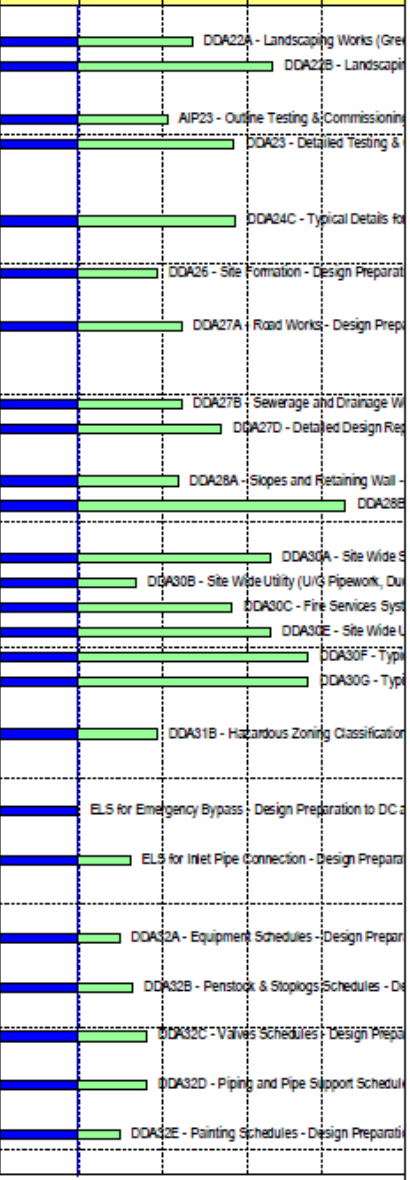
TASK filter: 3 Months Rolling Programme.

CONTRACT NO. DC/2013/10 DESIGN, BUILD & OPERATE
SAN WAI SEWAGE TREATMENT WORKS - PHASE 1
MASTER PROGRAMME Rev 10 (30 November 2018)
THREE (3) MONTHS ROLLING PROGRAMME

Date	Revision	Checked	Approved
30-Nov-18	Three (3) Months Rolling Programme...		

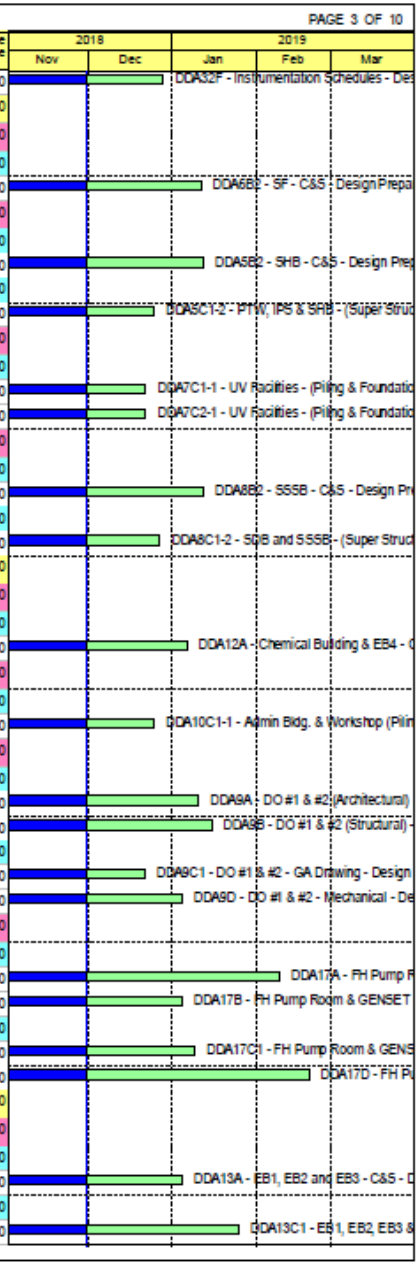
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
	Landscaping Works (AIP22 / DDA22AB)	766	06-Jan-17 A	10-Feb-19	06-Jan-17	10-Feb-19	0	0
DG1260	DDA22A - Landscaping Works (Green Roof) - Design Preparation to SO Approval	736	06-Jan-17 A	11-Jan-19	06-Jan-17	11-Jan-19	0	0
DG1274	DDA22B - Landscaping Works (Site Wide) - Design Preparation to SO Approval	588	03-Jul-17 A	10-Feb-19	03-Jul-17	10-Feb-19	0	0
	Testing and Commissioning Plan (AIP23 / DDA23)	426	28-Nov-17 A	27-Jan-19	28-Nov-17	27-Jan-19	0	0
DG3270	AIP23 - Outline Testing & Commissioning Plan - Design Preparation to SO Approval	401	28-Nov-17 A	02-Jan-19	28-Nov-17	02-Jan-19	0	0
DG3305	DDA23 - Detailed Testing & Commissioning Plan - Design Preparation to SO Approval	281	22-Apr-18 A	27-Jan-19	22-Apr-18	27-Jan-19	0	0
	General Notes Drawings for Foundation and Civil & Structural (AIP24AB / DDA24AB)	705	22-Feb-17 A	27-Jan-19	22-Feb-17	27-Jan-19	0	0
	General Notes Drawings for Civil & Structural (AIP24B / DDA24BC)	705	22-Feb-17 A	27-Jan-19	22-Feb-17	27-Jan-19	0	0
DG3706	DDA24C - Typical Details for Architecture - Design Preparation to SO Approval	705	22-Feb-17 A	27-Jan-19	22-Feb-17	27-Jan-19	0	0
	Site Formation (AIP26 / DDA26)	715	14-Jan-17 A	29-Dec-18	14-Jan-17	29-Dec-18	0	0
DG660	DDA26 - Site Formation - Design Preparation to SO Approval	715	14-Jan-17 A	29-Dec-18	14-Jan-17	29-Dec-18	0	0
	Road Works (AIP27A / DDA27A)	656	23-Mar-17 A	07-Jan-19	23-Mar-17	07-Jan-19	0	0
DG1060	DDA27A - Road Works - Design Preparation to SO Approval	656	23-Mar-17 A	07-Jan-19	23-Mar-17	07-Jan-19	0	0
	Sewerage and Drainage Works (AIP27B / DDA27BC1C2DEF)	701	21-Feb-17 A	22-Jan-19	21-Feb-17	22-Jan-19	0	0
	Civil and Structural Design (AIP27B / DDA27BD)	701	21-Feb-17 A	22-Jan-19	21-Feb-17	22-Jan-19	0	0
DG960	DDA27B - Sewerage and Drainage Works - Design Preparation to SO Approval	686	21-Feb-17 A	07-Jan-19	21-Feb-17	07-Jan-19	0	0
DG988	DDA27D - Detailed Design Report for Pipe Trenches - C&S - Design Preparation to SO Approval	625	08-May-17 A	22-Jan-19	08-May-17	22-Jan-19	0	0
	Boundary Wall & Entrance (AIP28 / DDA28AB)	765	03-Feb-17 A	09-Mar-19	03-Feb-17	09-Mar-19	0	0
DG1160	DDA28A - Slopes and Retaining Wall - Design Preparation to SO Approval	703	03-Feb-17 A	06-Jan-19	03-Feb-17	06-Jan-19	0	0
DG1195	DDA28B - Boundary Wall & Entrance - Design Preparation to SO Approval	631	17-Jun-17 A	09-Mar-19	17-Jun-17	09-Mar-19	0	0
	Site Wide Utility (AIP30 / DDA30ABCEFGI)	755	30-Jan-17 A	23-Feb-19	30-Jan-17	23-Feb-19	0	0
DG3515	DDA30A - Site Wide Security Access Control & Communication System - Design Preparation to SO Approval	741	30-Jan-17 A	09-Feb-19	30-Jan-17	09-Feb-19	0	0
DG3774	DDA30B - Site Wide Utility (U/G Pipework, Ductwork, Cable Route, Cable Draw Pit) - Design Preparation to SO Approval	562	08-Jun-17 A	21-Dec-18	08-Jun-17	21-Dec-18	0	0
DG3788	DDA30C - Fire Services System and Street Fire Hydrant System - Design Preparation to SO Approval	598	08-Jun-17 A	26-Jan-19	08-Jun-17	26-Jan-19	0	0
DG3816	DDA30E - Site Wide Utility (Road Lighting) - Design Preparation to SO Approval	597	23-Jun-17 A	09-Feb-19	23-Jun-17	09-Feb-19	0	0
DG3830	DDA30F - Typical Electrical Installation Drawings - Design Preparation to SO Approval	626	08-Jun-17 A	23-Feb-19	08-Jun-17	23-Feb-19	0	0
DG3844	DDA30G - Typical Building Services Installation Drawings - Design Preparation to SO Approval	611	23-Jun-17 A	23-Feb-19	23-Jun-17	23-Feb-19	0	0
	HAZOP Report (DDA31B)	485	01-Sep-17 A	29-Dec-18	01-Sep-17	29-Dec-18	0	0
DG3545	DDA31B - Hazardous Zoning Classification Report - Design Preparation to SO Approval	485	01-Sep-17 A	29-Dec-18	01-Sep-17	29-Dec-18	0	0
	ELS / Bulk Excavation (Temporary Works)	556	12-Jun-17 A	19-Dec-18	12-Jun-17	19-Dec-18	0	0
	ELS for Emergency Bypass	537	12-Jun-17 A	30-Nov-18	12-Jun-17	30-Nov-18	0	0
DG3740	ELS for Emergency Bypass - Design Preparation to DC and SO Approval	537	12-Jun-17 A	30-Nov-18	12-Jun-17	30-Nov-18	0	0
	ELS for Inlet Pipe Connection	472	04-Sep-17 A	19-Dec-18	04-Sep-17	19-Dec-18	0	0
DG3755	ELS for Inlet Pipe Connection - Design Preparation to DC and SO Approval	472	04-Sep-17 A	19-Dec-18	04-Sep-17	19-Dec-18	0	0
	Miscellaneous Design	544	03-Jul-17 A	28-Dec-18	03-Jul-17	28-Dec-18	0	0
	Equipment Schedules (DDA32A)	531	03-Jul-17 A	15-Dec-18	03-Jul-17	15-Dec-18	0	0
DG2012	DDA32A - Equipment Schedules - Design Preparation to SO Approval	531	03-Jul-17 A	15-Dec-18	03-Jul-17	15-Dec-18	0	0
	Penstock & Stoplogs Schedules (DDA32B)	536	03-Jul-17 A	20-Dec-18	03-Jul-17	20-Dec-18	0	0
DG3216	DDA32B - Penstock & Stoplogs Schedules - Design Preparation to SO Approval	536	03-Jul-17 A	20-Dec-18	03-Jul-17	20-Dec-18	0	0
	Valves Schedules (DDA32C)	541	03-Jul-17 A	25-Dec-18	03-Jul-17	25-Dec-18	0	0
DG3222	DDA32C - Valves Schedules - Design Preparation to SO Approval	541	03-Jul-17 A	25-Dec-18	03-Jul-17	25-Dec-18	0	0
	Piping and Pipe Support Schedules (DDA32D)	541	03-Jul-17 A	25-Dec-18	03-Jul-17	25-Dec-18	0	0
DG3864	DDA32D - Piping and Pipe Support Schedules - Design Preparation to SO Approval	541	03-Jul-17 A	25-Dec-18	03-Jul-17	25-Dec-18	0	0
	Painting Schedules (DDA32E)	531	03-Jul-17 A	15-Dec-18	03-Jul-17	15-Dec-18	0	0
DG3228	DDA32E - Painting Schedules - Design Preparation to SO Approval	531	03-Jul-17 A	15-Dec-18	03-Jul-17	15-Dec-18	0	0
	Instrumentation Schedules (DDA32F)	544	03-Jul-17 A	28-Dec-18	03-Jul-17	28-Dec-18	0	0



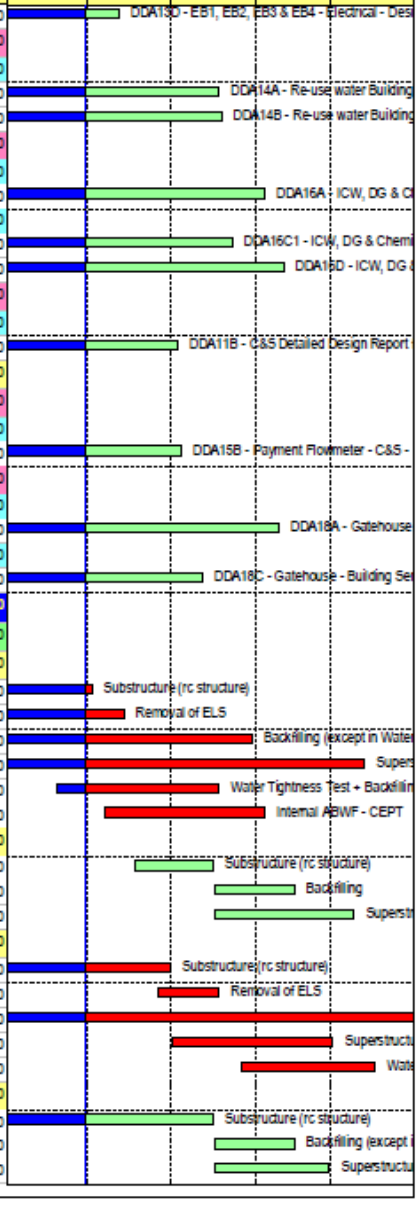
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
DG3234	DDA32F - Instrumentation Schedules - Design Preparation to SO Approval	544	03-Jul-17 A	28-Dec-18	03-Jul-17	28-Dec-18	0	0
LOT #1 - Building / Facilities Design : CEPT+SF, PTW+IPS+SHB, UV, SDB+SSSB		752	22-Dec-16 A	12-Jan-19	22-Dec-16	12-Jan-19	0	0
CEPT and System Control Flowmeter Chamber		657	26-Mar-17 A	11-Jan-19	26-Mar-17	11-Jan-19	0	0
Civil and Structural Design (AIP6A / DDA6AB1B2)		657	26-Mar-17 A	11-Jan-19	26-Mar-17	11-Jan-19	0	0
DB4930	DDA6B2 - SF - C&S - Design Preparation to SO Approval	657	26-Mar-17 A	11-Jan-19	26-Mar-17	11-Jan-19	0	0
Inlet Work, Preliminary Treatment Works, IPS and SHB		706	06-Feb-17 A	12-Jan-19	06-Feb-17	12-Jan-19	0	0
Civil and Structural Design (AIP5A / DDA5AB1B2)		706	06-Feb-17 A	12-Jan-19	06-Feb-17	12-Jan-19	0	0
DB4830	DDA5B2 - SHB - C&S - Design Preparation to SO Approval	706	06-Feb-17 A	12-Jan-19	06-Feb-17	12-Jan-19	0	0
Electrical and Mechanical Design (AIP5B / DDA5C1C2DEF)		633	01-Apr-17 A	25-Dec-18	01-Apr-17	25-Dec-18	0	0
DB1264	DDA5C1-2 - PTW, IPS & SHB - (Super Structural Design) - GA Drawing - Design Preparation to SO Approval	633	01-Apr-17 A	25-Dec-18	01-Apr-17	25-Dec-18	0	0
UV Disinfection Facilities		730	22-Dec-16 A	22-Dec-18	22-Dec-16	22-Dec-18	0	0
Electrical and Mechanical Design (AIP7B / DDA7C1C2DEF)		730	22-Dec-16 A	22-Dec-18	22-Dec-16	22-Dec-18	0	0
DB1352	DDA7C1-1 - UV Facilities - (Piling & Foundation Design) - GA Drawing - Design Preparation to SO Approval	730	22-Dec-16 A	22-Dec-18	22-Dec-16	22-Dec-18	0	0
DB1384	DDA7C2-1 - UV Facilities - (Piling & Foundation Design) - CR Drawing - Design Preparation to SO Approval	730	22-Dec-16 A	22-Dec-18	22-Dec-16	22-Dec-18	0	0
Sludge Dewatering Building and Sludge Skip Storage Building		708	04-Feb-17 A	12-Jan-19	04-Feb-17	12-Jan-19	0	0
Civil and Structural Design (AIP8A / DDA8AB1B2)		708	04-Feb-17 A	12-Jan-19	04-Feb-17	12-Jan-19	0	0
DB4858	DDA8B2 - SSSB - C&S - Design Preparation to SO Approval	708	04-Feb-17 A	12-Jan-19	04-Feb-17	12-Jan-19	0	0
Electrical and Mechanical Design (AIP8B / DDA8C1C2DEF)		608	29-Apr-17 A	27-Dec-18	29-Apr-17	27-Dec-18	0	0
DB1476	DDA8C1-2 - SDB and SSSB - (Super Structural Design) - GA Drawing - Design Preparation to SO Approval	608	29-Apr-17 A	27-Dec-18	29-Apr-17	27-Dec-18	0	0
LOT #2 - Building / Facilities Design : AB+WS, DO, CB+EB4, FH		871	03-Oct-16 A	20-Feb-19	03-Oct-16	20-Feb-19	0	0
Chemical Building and EB 4		706	31-Jan-17 A	06-Jan-19	31-Jan-17	06-Jan-19	0	0
Civil and Structural Design for CB & EB4 (AIP12A / DDA12AB)		706	31-Jan-17 A	06-Jan-19	31-Jan-17	06-Jan-19	0	0
DB2123	DDA12A - Chemical Building & EB4 - C&S - Design Preparation to SO Approval	706	31-Jan-17 A	06-Jan-19	31-Jan-17	06-Jan-19	0	0
Administration Building & Maintenance Workshop		813	03-Oct-16 A	25-Dec-18	03-Oct-16	25-Dec-18	0	0
Electrical and Mechanical Design (AIP10B / DDA10C1C2DEF)		813	03-Oct-16 A	25-Dec-18	03-Oct-16	25-Dec-18	0	0
DB2286	DDA10C1-1 - Admin Bldg. & Workshop (Piling & Foundation Design) - GA Drawing - Design Preparation to SO Approval	813	03-Oct-16 A	25-Dec-18	03-Oct-16	25-Dec-18	0	0
Deodorization Facilities No.1 and No.2		762	15-Dec-16 A	15-Jan-19	15-Dec-16	15-Jan-19	0	0
Civil and Structural Design (AIP9A / DDA9AB)		720	26-Jan-17 A	15-Jan-19	26-Jan-17	15-Jan-19	0	0
DB2323	DDA9A - DO #1 & #2 (Architectural) - C&S - Design Preparation to SO Approval	715	26-Jan-17 A	10-Jan-19	26-Jan-17	10-Jan-19	0	0
DB5150	DDA9B - DO #1 & #2 (Structural) - C&S - Design Preparation to SO Approval	590	05-Jun-17 A	15-Jan-19	05-Jun-17	15-Jan-19	0	0
Electrical and Mechanical Design (AIP9B / DDA9C1C2DEF)		751	15-Dec-16 A	04-Jan-19	15-Dec-16	04-Jan-19	0	0
DB2348	DDA9C1 - DO #1 & #2 - GA Drawing - Design Preparation to SO Approval	737	15-Dec-16 A	21-Dec-18	15-Dec-16	21-Dec-18	0	0
DB4634	DDA9D - DO #1 & #2 - Mechanical - Design Preparation to SO Approval	709	26-Jan-17 A	04-Jan-19	26-Jan-17	04-Jan-19	0	0
Street Fire Hydrant Pump Room & GENSET Room		806	07-Dec-16 A	20-Feb-19	07-Dec-16	20-Feb-19	0	0
Civil and Structural Design (AIP17A / DDA17AB)		689	23-Mar-17 A	09-Feb-19	23-Mar-17	09-Feb-19	0	0
DB2423	DDA17A - FH Pump Room & GENSET Room (Architectural) - C&S - Design Preparation to SO Approval	689	23-Mar-17 A	09-Feb-19	23-Mar-17	09-Feb-19	0	0
DB5220	DDA17B - FH Pump Room & GENSET Room (Structural) - C&S - Design Preparation to SO Approval	522	01-Aug-17 A	04-Jan-19	01-Aug-17	04-Jan-19	0	0
Electrical and Mechanical Design (AIP17B / DDA17C1C2DE)		806	07-Dec-16 A	20-Feb-19	07-Dec-16	20-Feb-19	0	0
DB2448	DDA17C1 - FH Pump Room & GENSET Room - GA Drawing - Design Preparation to SO Approval	764	07-Dec-16 A	09-Jan-19	07-Dec-16	09-Jan-19	0	0
DB4648	DDA17D - FH Pump Room & GENSET Room - Electrical - Design Preparation to SO Approval	700	23-Mar-17 A	20-Feb-19	23-Mar-17	20-Feb-19	0	0
LOT #3 - Building / Facilities Design : EB1, EB2, EB3, EB4, RW, DG+ICW, Inlet/Outlet Connection		879	16-Sep-16 A	11-Feb-19	16-Sep-16	11-Feb-19	0	0
Electrical Building No.1, No.2, No.3, No.4		862	16-Sep-16 A	25-Jan-19	16-Sep-16	25-Jan-19	0	0
Civil and Structural Design for EB123 (AIP13A / DDA13AB)		637	08-Apr-17 A	04-Jan-19	08-Apr-17	04-Jan-19	0	0
DB3123	DDA13A - EB1, EB2 and EB3 - C&S - Design Preparation to SO Approval	637	08-Apr-17 A	04-Jan-19	08-Apr-17	04-Jan-19	0	0
Electrical and Mechanical Design for EB1234 (AIP13B / DDA13C1C2DE)		862	16-Sep-16 A	25-Jan-19	16-Sep-16	25-Jan-19	0	0
DB3148	DDA13C1 - EB1, EB2, EB3 & EB4 - GA Drawing - Design Preparation to SO Approval	862	16-Sep-16 A	25-Jan-19	16-Sep-16	25-Jan-19	0	0



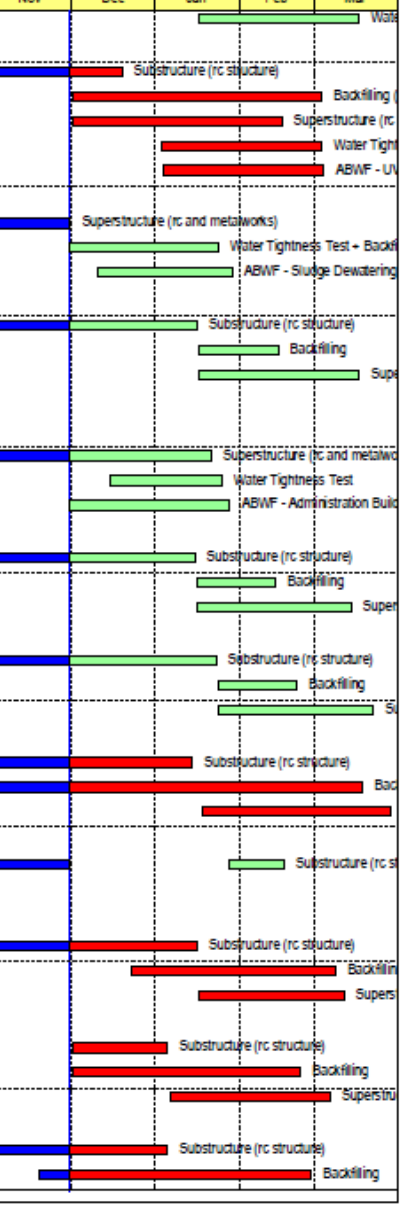
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
DB4664	DDA13D - EB1, EB2, EB3 & EB4 - Electrical - Design Preparation to SO Approval	658	23-Feb-17 A	12-Dec-18	23-Feb-17	12-Dec-18	0	0
Re-use Water Building		647	13-Apr-17 A	19-Jan-19	13-Apr-17	19-Jan-19	0	0
Civil and Structural Design (AIP14A / DDA14AB)		647	13-Apr-17 A	19-Jan-19	13-Apr-17	19-Jan-19	0	0
DB3223	DDA14A - Re-use water Building (Architectural) - C&S - Design Preparation to SO Approval	646	13-Apr-17 A	18-Jan-19	13-Apr-17	18-Jan-19	0	0
DB5080	DDA14B - Re-use water Building (Structural) - C&S - Design Preparation to SO Approval	520	18-Aug-17 A	19-Jan-19	18-Aug-17	19-Jan-19	0	0
ICW and DG Store & Chemical Waste Storage Building		804	30-Nov-16 A	11-Feb-19	30-Nov-16	11-Feb-19	0	0
Civil and Structural Design (AIP16A / DDA16AB)		477	16-Oct-17 A	04-Feb-19	16-Oct-17	04-Feb-19	0	0
DB3323	DDA16A - ICW, DG & Chemical Stores - C&S - Design Preparation to SO Approval	477	16-Oct-17 A	04-Feb-19	16-Oct-17	04-Feb-19	0	0
Electrical and Mechanical Design (AIP16B / DDA16C1C2D)		804	30-Nov-16 A	11-Feb-19	30-Nov-16	11-Feb-19	0	0
DB3348	DDA16C1 - ICW, DG & Chemical Stores - GA Drawing - Design Preparation to SO Approval	785	30-Nov-16 A	23-Jan-19	30-Nov-16	23-Jan-19	0	0
DB4694	DDA16D - ICW, DG & Chemical Stores - Building Services - Design Preparation to SO Approval	629	24-May-17 A	11-Feb-19	24-May-17	11-Feb-19	0	0
Inlet & Outlet Pipe Connections and Diversion Pipeworks		636	08-Apr-17 A	03-Jan-19	08-Apr-17	03-Jan-19	0	0
Civil and Structural Design (AIP11 / DDA11ABC)		636	08-Apr-17 A	03-Jan-19	08-Apr-17	03-Jan-19	0	0
DB3438	DDA11B - C&S Detailed Design Report for Inlet Connections Pipework - Design Preparation to SO Approval	636	08-Apr-17 A	03-Jan-19	08-Apr-17	03-Jan-19	0	0
LOT #4 - Building / Facilities Design : GH, PF		668	13-Apr-17 A	09-Feb-19	13-Apr-17	09-Feb-19	0	0
Payment Flowmeter Chamber		632	13-Apr-17 A	04-Jan-19	13-Apr-17	04-Jan-19	0	0
Civil and Structural Design (AIP15A / DDA15B)		632	13-Apr-17 A	04-Jan-19	13-Apr-17	04-Jan-19	0	0
DB4323	DDA15B - Payment Flowmeter - C&S - Design Preparation to SO Approval	632	13-Apr-17 A	04-Jan-19	13-Apr-17	04-Jan-19	0	0
Gatehouse		657	24-Apr-17 A	09-Feb-19	24-Apr-17	09-Feb-19	0	0
Civil and Structural Design (AIP18A / DDA18AB)		572	18-Jul-17 A	09-Feb-19	18-Jul-17	09-Feb-19	0	0
DB4424	DDA18A - Gatehouse - C&S - Design Preparation to SO Approval	572	18-Jul-17 A	09-Feb-19	18-Jul-17	09-Feb-19	0	0
Electrical and Mechanical Design (AIP18B / DDA18C)		629	24-Apr-17 A	12-Jan-19	24-Apr-17	12-Jan-19	0	0
DB4754	DDA18C - Gatehouse - Building Services - Design Preparation to SO Approval	629	24-Apr-17 A	12-Jan-19	24-Apr-17	12-Jan-19	0	0
Civil & Structural Works		849	04-Oct-17 A	30-Jan-20	04-Oct-17	30-Jan-20	0	0
LOT #1 - Bldg / Facilities Const. (Arch'l & Struct'l) : CEPT+SF, PTW+IPS+SHB, UV, SDB+SSSB		543	07-Oct-17 A	02-Apr-19	07-Oct-17	02-Apr-19	0	0
Chemically Enhanced Primary Treatment (CEPT)		412	26-Jan-18 A	13-Mar-19	26-Jan-18	13-Mar-19	0	0
CS1520	Substructure (rc structure)	311	26-Jan-18 A	02-Dec-18	26-Jan-18	02-Dec-18	0	0
CS1525	Removal of ELS	47	29-Oct-18 A	14-Dec-18	29-Oct-18	14-Dec-18	0	0
CS1526	Backfilling (except in Water Tightness Test area)	278	28-Apr-18 A	30-Jan-19	28-Apr-18	30-Jan-19	0	0
CS1530	Superstructure (rc and metalworks)	385	22-Feb-18 A	13-Mar-19	22-Feb-18	13-Mar-19	0	0
CS1534	Water Tightness Test + Backfilling	60	20-Nov-18 A	18-Jan-19	20-Nov-18	18-Jan-19	0	0
CS1540	Internal ABWF - CEPT	60	07-Dec-18	04-Feb-19	07-Dec-18	04-Feb-19	0	0
System Control Flowmeter Chamber (SF)		82	18-Dec-18	09-Mar-19	18-Dec-18	09-Mar-19	0	0
CS1400	Substructure (rc structure)	30	18-Dec-18	16-Jan-19	18-Dec-18	16-Jan-19	0	0
CS1405	Backfilling	30	17-Jan-19	15-Feb-19	17-Jan-19	15-Feb-19	0	0
CS1410	Superstructure (rc and metalworks)	52	17-Jan-19	09-Mar-19	17-Jan-19	09-Mar-19	0	0
Inlet Work, Preliminary Treatment Works and Inlet Pumping Station (PTW & IPS)		158	27-Oct-18 A	02-Apr-19	27-Oct-18	02-Apr-19	0	0
CS1220	Substructure (rc structure)	66	27-Oct-18 A	31-Dec-18	27-Oct-18	31-Dec-18	0	0
CS1224	Removal of ELS	23	27-Dec-18	18-Jan-19	27-Dec-18	18-Jan-19	0	0
CS1225	Backfilling (except in Water Tightness Test area)	154	31-Oct-18 A	02-Apr-19	31-Oct-18	02-Apr-19	0	0
CS1230	Superstructure (rc and metalworks)	60	01-Jan-19	01-Mar-19	01-Jan-19	01-Mar-19	0	0
CS1235	Water Tightness Test + Backfilling	50	27-Jan-19	17-Mar-19	27-Jan-19	17-Mar-19	0	0
Solid Handling Building (SHB)		512	22-Oct-17 A	17-Mar-19	22-Oct-17	17-Mar-19	0	0
CS1300	Substructure (rc structure)	452	22-Oct-17 A	16-Jan-19	22-Oct-17	16-Jan-19	0	0
CS1305	Backfilling (except in Water Tightness Test area)	30	17-Jan-19	15-Feb-19	17-Jan-19	15-Feb-19	0	0
CS1310	Superstructure (rc and metalworks)	43	17-Jan-19	28-Feb-19	17-Jan-19	28-Feb-19	0	0



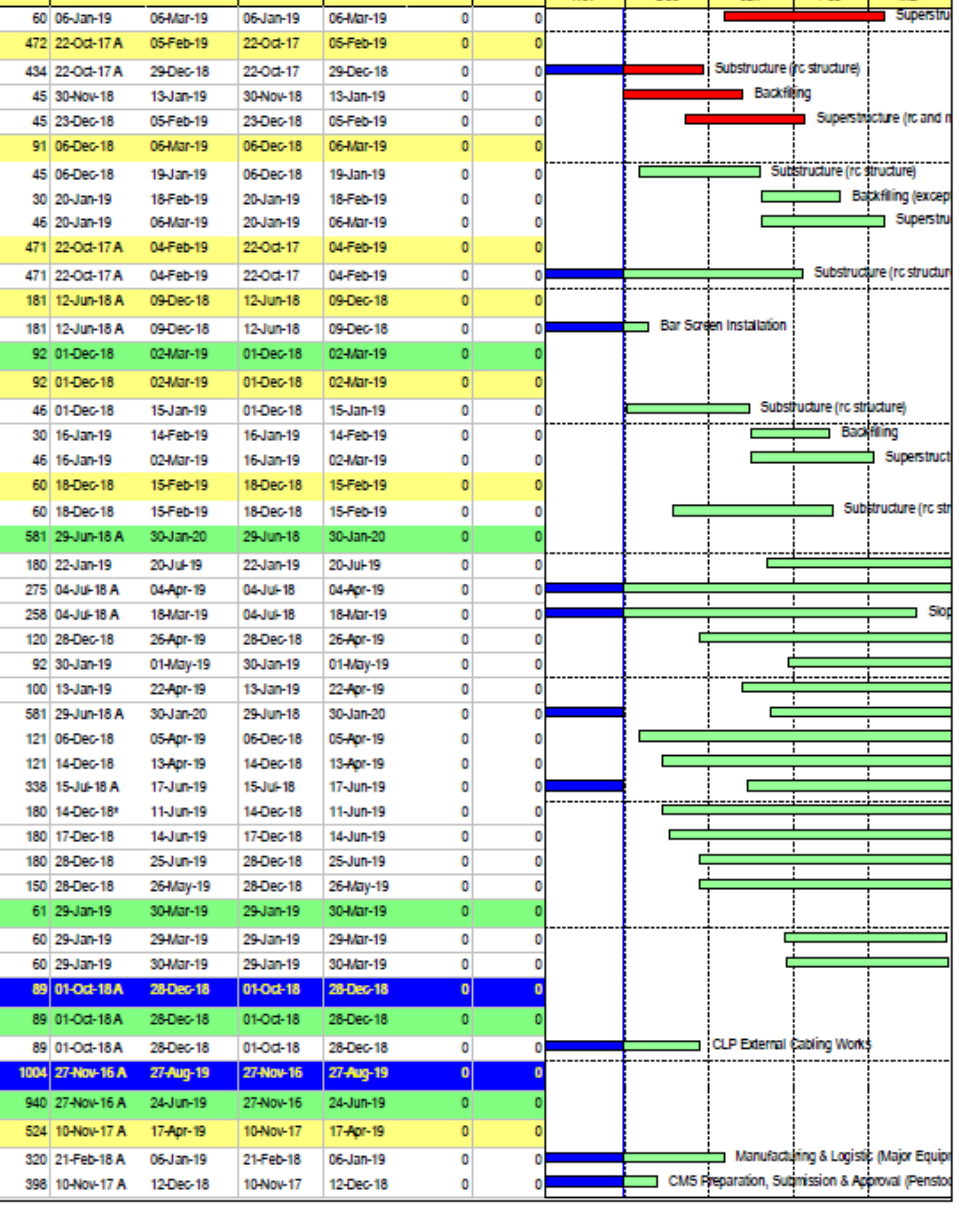
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
CS1315	Water Tightness Test + Backfilling	60	17-Jan-19	17-Mar-19	17-Jan-19	17-Mar-19	0	0
UV Disinfection Facility (UV)		514	07-Oct-17 A	04-Mar-19	07-Oct-17	04-Mar-19	0	0
CS1910	Substructure (rc structure)	439	07-Oct-17 A	19-Dec-18	07-Oct-17	19-Dec-18	0	0
CS1915	Backfilling (except in Water Tightness Test area)	93	01-Dec-18	03-Mar-19	01-Dec-18	03-Mar-19	0	0
CS1920	Superstructure (rc and metalworks)	78	01-Dec-18	16-Feb-19	01-Dec-18	16-Feb-19	0	0
CS1925	Water Tightness Test + Backfilling	60	03-Jan-19	03-Mar-19	03-Jan-19	03-Mar-19	0	0
CS1930	ABWF - UV Disinfection Facility	60	04-Jan-19	04-Mar-19	04-Jan-19	04-Mar-19	0	0
Sludge Dewatering Building (SDB)		331	05-Mar-18 A	29-Jan-19	05-Mar-18	29-Jan-19	0	0
CS1840	Superstructure (rc and metalworks)	271	05-Mar-18 A	30-Nov-18	05-Mar-18	30-Nov-18	0	0
CS1845	Water Tightness Test + Backfilling	55	30-Nov-18	24-Jan-19	30-Nov-18	24-Jan-19	0	0
CS1850	ABWF - Sludge Dewatering Building	50	10-Dec-18	29-Jan-19	10-Dec-18	29-Jan-19	0	0
Sludge Skip Storage Building (SSSB)		512	22-Oct-17 A	17-Mar-19	22-Oct-17	17-Mar-19	0	0
CS2900	Substructure (rc structure)	452	22-Oct-17 A	16-Jan-19	22-Oct-17	16-Jan-19	0	0
CS2905	Backfilling	30	17-Jan-19	15-Feb-19	17-Jan-19	15-Feb-19	0	0
CS2910	Superstructure (rc and metalworks)	60	17-Jan-19	17-Mar-19	17-Jan-19	17-Mar-19	0	0
LOT #2 - Bldg / Facilities Const. (Arch'l & Struct'l) : AB+WS, DO, CB, FH		532	13-Oct-17 A	28-Mar-19	13-Oct-17	28-Mar-19	0	0
Administration Building & Maintenance Workshop (AB & WS)		202	11-Jul-18 A	28-Jan-19	11-Jul-18	28-Jan-19	0	0
CS1120	Superstructure (rc and metalworks)	195	11-Jul-18 A	21-Jan-19	11-Jul-18	21-Jan-19	0	0
CS1125	Water Tightness Test	42	15-Dec-18	25-Jan-19	15-Dec-18	25-Jan-19	0	0
CS1130	ABWF - Administration Building & Maintenance Workshop	60	30-Nov-18	28-Jan-19	30-Nov-18	28-Jan-19	0	0
Deodorization Facilities No. 1 (DO 1)		512	19-Oct-17 A	14-Mar-19	19-Oct-17	14-Mar-19	0	0
CS1610	Substructure (rc structure)	454	19-Oct-17 A	15-Jan-19	19-Oct-17	15-Jan-19	0	0
CS1615	Backfilling	30	16-Jan-19	14-Feb-19	16-Jan-19	14-Feb-19	0	0
CS1620	Superstructure (rc and metalworks)	58	16-Jan-19	14-Mar-19	16-Jan-19	14-Mar-19	0	0
Deodorization Facilities No. 2 (DO 2)		517	22-Oct-17 A	22-Mar-19	22-Oct-17	22-Mar-19	0	0
CS1710	Substructure (rc structure)	459	22-Oct-17 A	23-Jan-19	22-Oct-17	23-Jan-19	0	0
CS1715	Backfilling	30	24-Jan-19	22-Feb-19	24-Jan-19	22-Feb-19	0	0
CS1720	Superstructure (rc and metalworks)	58	24-Jan-19	22-Mar-19	24-Jan-19	22-Mar-19	0	0
Chemical Building (CB)		532	13-Oct-17 A	28-Mar-19	13-Oct-17	28-Mar-19	0	0
CS2310	Substructure (rc structure)	459	13-Oct-17 A	14-Jan-19	13-Oct-17	14-Jan-19	0	0
CS2315	Backfilling	214	17-Aug-18 A	18-Mar-19	17-Aug-18	18-Mar-19	0	0
CS2320	Superstructure (rc and metalworks)	70	18-Jan-19	28-Mar-19	18-Jan-19	28-Mar-19	0	0
Street Fire Hydrant Pump Room & GENSET Room (FH)		489	17-Oct-17 A	17-Feb-19	17-Oct-17	17-Feb-19	0	0
CS3010	Substructure (rc structure)	489	17-Oct-17 A	17-Feb-19	17-Oct-17	17-Feb-19	0	0
LOT #3 - Bldg / Facilities Const. (Arch'l & Struct'l) : EB, RW, DG, ICW, JC		524	04-Oct-17 A	11-Mar-19	04-Oct-17	11-Mar-19	0	0
Electrical Building No.1 (EB1)		506	22-Oct-17 A	11-Mar-19	22-Oct-17	11-Mar-19	0	0
CS2410	Substructure (rc structure)	452	22-Oct-17 A	16-Jan-19	22-Oct-17	16-Jan-19	0	0
CS2415	Backfilling	76	23-Dec-18	08-Mar-19	23-Dec-18	08-Mar-19	0	0
CS2420	Superstructure (rc and metalworks)	54	17-Jan-19	11-Mar-19	17-Jan-19	11-Mar-19	0	0
Electrical Building No.2 (EB2)		96	01-Dec-18	06-Mar-19	01-Dec-18	06-Mar-19	0	0
CS2510	Substructure (rc structure)	36	01-Dec-18	05-Jan-19	01-Dec-18	05-Jan-19	0	0
CS2515	Backfilling	85	01-Dec-18	23-Feb-19	01-Dec-18	23-Feb-19	0	0
CS2520	Superstructure (rc and metalworks)	60	06-Jan-19	06-Mar-19	06-Jan-19	06-Mar-19	0	0
Electrical Building No.3 (EB3)		519	04-Oct-17 A	06-Mar-19	04-Oct-17	06-Mar-19	0	0
CS2610	Substructure (rc structure)	459	04-Oct-17 A	05-Jan-19	04-Oct-17	05-Jan-19	0	0
CS2615	Backfilling	101	19-Nov-18 A	27-Feb-19	19-Nov-18	27-Feb-19	0	0



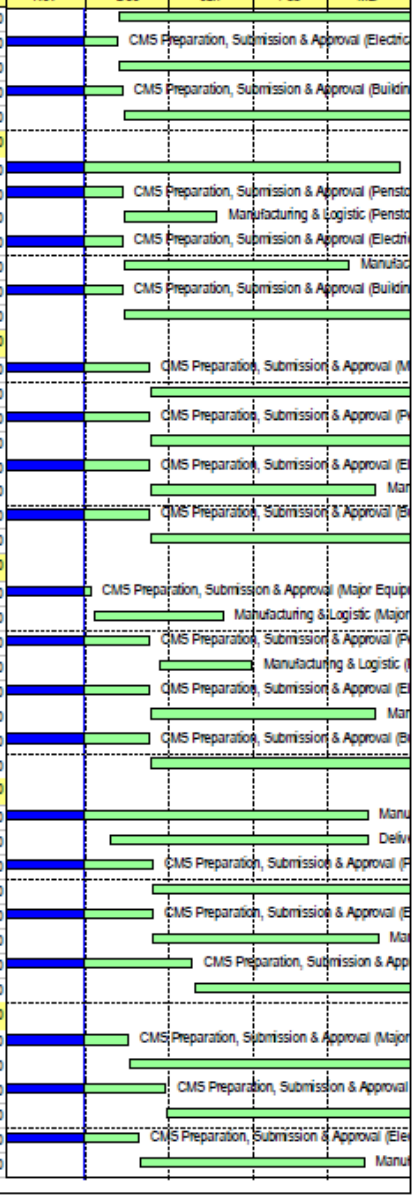
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
CS2620	Superstructure (rc and metalworks)	60	06-Jan-19	06-Mar-19	06-Jan-19	06-Mar-19	0	0
Electrical Building No.4 (EB4)		472	22-Oct-17 A	05-Feb-19	22-Oct-17	05-Feb-19	0	0
CS2710	Substructure (rc structure)	434	22-Oct-17 A	29-Dec-18	22-Oct-17	29-Dec-18	0	0
CS2715	Backfilling	45	30-Nov-18	13-Jan-19	30-Nov-18	13-Jan-19	0	0
CS2720	Superstructure (rc and metalworks)	45	23-Dec-18	05-Feb-19	23-Dec-18	05-Feb-19	0	0
Re-use Water Building (RW)		91	06-Dec-18	06-Mar-19	06-Dec-18	06-Mar-19	0	0
CS2010	Substructure (rc structure)	45	06-Dec-18	19-Jan-19	06-Dec-18	19-Jan-19	0	0
CS2015	Backfilling (except in Water Tightness Test area)	30	20-Jan-19	18-Feb-19	20-Jan-19	18-Feb-19	0	0
CS2020	Superstructure (rc and metalworks)	46	20-Jan-19	06-Mar-19	20-Jan-19	06-Mar-19	0	0
DG Store & Chemical Waste Storage Building (DG) and Irrigation & Cleansing Water Pump Room (ICW)		471	22-Oct-17 A	04-Feb-19	22-Oct-17	04-Feb-19	0	0
CS2800	Substructure (rc structure)	471	22-Oct-17 A	04-Feb-19	22-Oct-17	04-Feb-19	0	0
Existing Junction Chamber (JC)		181	12-Jun-18 A	09-Dec-18	12-Jun-18	09-Dec-18	0	0
CS2210	Bar Screen Installation	181	12-Jun-18 A	09-Dec-18	12-Jun-18	09-Dec-18	0	0
LOT #4 - Bldg / Facilities Const. (Arch'l & Struct'l) : GH, PF, FW		92	01-Dec-18	02-Mar-19	01-Dec-18	02-Mar-19	0	0
Payment Flowmeter Chamber (PF)		92	01-Dec-18	02-Mar-19	01-Dec-18	02-Mar-19	0	0
CS2100	Substructure (rc structure)	46	01-Dec-18	15-Jan-19	01-Dec-18	15-Jan-19	0	0
CS2105	Backfilling	30	16-Jan-19	14-Feb-19	16-Jan-19	14-Feb-19	0	0
CS2110	Superstructure (rc and metalworks)	46	16-Jan-19	02-Mar-19	16-Jan-19	02-Mar-19	0	0
Foul Water Pump Sump (FW)		60	18-Dec-18	15-Feb-19	18-Dec-18	15-Feb-19	0	0
CS3395	Substructure (rc structure)	60	18-Dec-18	15-Feb-19	18-Dec-18	15-Feb-19	0	0
External Works & Miscellaneous		581	29-Jun-18 A	30-Jan-20	29-Jun-18	30-Jan-20	0	0
CS3200	Site Formation along Boundary Wall (Perimeter)	180	22-Jan-19	20-Jul-19	22-Jan-19	20-Jul-19	0	0
CS3201	Slope works and Retaining Wall (Eastern Portion)	275	04-Jul-18 A	04-Apr-19	04-Jul-18	04-Apr-19	0	0
CS3203	Slope works and Retaining Wall (Northern Portion)	258	04-Jul-18 A	18-Mar-19	04-Jul-18	18-Mar-19	0	0
CS3210	Drainage Inlet connection (Diversion of Three Existing Sewage Rising Mains) incl. slope & retaining wall work @ P8	120	28-Dec-18	26-Apr-19	28-Dec-18	26-Apr-19	0	0
CS3225	Drainage Outlet connection to the Existing Stormwater Drainage System along Ha Tsuen Road	92	30-Jan-19	01-May-19	30-Jan-19	01-May-19	0	0
CS3230	CLP Cable Duct and Draw Pits (within the Site)	100	13-Jan-19	22-Apr-19	13-Jan-19	22-Apr-19	0	0
CS3250	EVA (Road & Drainage)	581	29-Jun-18 A	30-Jan-20	29-Jun-18	30-Jan-20	0	0
CS3252	RC Trench and Odour Pipe (DO1, DO2)	121	06-Dec-18	05-Apr-19	06-Dec-18	05-Apr-19	0	0
CS3254	Process Pipe	121	14-Dec-18	13-Apr-19	14-Dec-18	13-Apr-19	0	0
CS3258	Emergency By-Pass Pipe	338	15-Jul-18 A	17-Jun-19	15-Jul-18	17-Jun-19	0	0
CS3260	Sewage Pipe	180	14-Dec-18*	11-Jun-19	14-Dec-18	11-Jun-19	0	0
CS3262	Cable Duct and Draw Pits	180	17-Dec-18	14-Jun-19	17-Dec-18	14-Jun-19	0	0
CS3276	WSD External Watermain Laying Works	180	28-Dec-18	25-Jun-19	28-Dec-18	25-Jun-19	0	0
CS3278	Internal Watermain Laying Works	150	28-Dec-18	26-May-19	28-Dec-18	26-May-19	0	0
Green Roof		61	29-Jan-19	30-Mar-19	29-Jan-19	30-Mar-19	0	0
CS3340	Administration Building and Maintenance Workshop	60	29-Jan-19	29-Mar-19	29-Jan-19	29-Mar-19	0	0
CS3350	Sludge Dewatering Building	60	29-Jan-19	30-Mar-19	29-Jan-19	30-Mar-19	0	0
Statutory Works		89	01-Oct-18 A	28-Dec-18	01-Oct-18	28-Dec-18	0	0
Electrical Supply & Energization - CLP		89	01-Oct-18 A	28-Dec-18	01-Oct-18	28-Dec-18	0	0
SR135	CLP External Cabling Works	89	01-Oct-18 A	28-Dec-18	01-Oct-18	28-Dec-18	0	0
E&M Works		1004	27-Nov-16 A	27-Aug-19	27-Nov-16	27-Aug-19	0	0
Procurement		940	27-Nov-16 A	24-Jun-19	27-Nov-16	24-Jun-19	0	0
Chemically Enhanced Primary Treatment (CEPT)		524	10-Nov-17 A	17-Apr-19	10-Nov-17	17-Apr-19	0	0
EM3112	Manufacturing & Logistic (Major Equipment)	320	21-Feb-18 A	06-Jan-19	21-Feb-18	06-Jan-19	0	0
EM3114	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	398	10-Nov-17 A	12-Dec-18	10-Nov-17	12-Dec-18	0	0



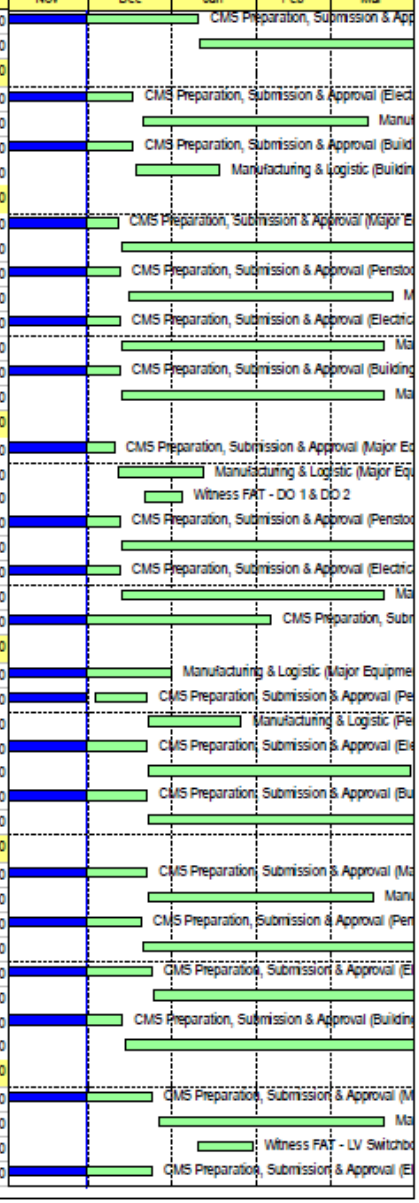
DATA DATE: 30-Nov-18 | LAYOUT: 5W Project PHase 1 Rev 10 (3M 30Nov18) | PAGE 7 OF 10

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
EM3116	Manufacturing & Logistic (Penstock, Pipe & Valve)	126	13-Dec-18	17-Apr-19	13-Dec-18	17-Apr-19	0	0
EM3118	CMS Preparation, Submission & Approval (Electrical)	398	10-Nov-17 A	12-Dec-18	10-Nov-17	12-Dec-18	0	0
EM3120	Manufacturing & Logistic (Electrical)	126	13-Dec-18	17-Apr-19	13-Dec-18	17-Apr-19	0	0
EM3122	CMS Preparation, Submission & Approval (Building Services)	400	10-Nov-17 A	14-Dec-18	10-Nov-17	14-Dec-18	0	0
EM3124	Manufacturing & Logistic (Building Services)	112	15-Dec-18	05-Apr-19	15-Dec-18	05-Apr-19	0	0
System Control Flowmeter Chamber (SF)		520	10-Nov-17 A	13-Apr-19	10-Nov-17	13-Apr-19	0	0
EM3134	Manufacturing & Logistic (Major Equipment)	181	28-Sep-18 A	27-Mar-19	28-Sep-18	27-Mar-19	0	0
EM3136	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	400	10-Nov-17 A	14-Dec-18	10-Nov-17	14-Dec-18	0	0
EM3138	Manufacturing & Logistic (Penstock, Pipe & Valve)	35	15-Dec-18	18-Jan-19	15-Dec-18	18-Jan-19	0	0
EM3140	CMS Preparation, Submission & Approval (Electrical)	400	10-Nov-17 A	14-Dec-18	10-Nov-17	14-Dec-18	0	0
EM3142	Manufacturing & Logistic (Electrical)	84	15-Dec-18	08-Mar-19	15-Dec-18	08-Mar-19	0	0
EM3144	CMS Preparation, Submission & Approval (Building Services)	400	10-Nov-17 A	14-Dec-18	10-Nov-17	14-Dec-18	0	0
EM3146	Manufacturing & Logistic (Building Services)	120	15-Dec-18	13-Apr-19	15-Dec-18	13-Apr-19	0	0
Inlet Work, Preliminary Treatment Units and Inlet Pumping Station (PTW & IPS)		880	04-Jan-17 A	02-Jun-19	04-Jan-17	02-Jun-19	0	0
EM3135	CMS Preparation, Submission & Approval (Major Equipment)	720	04-Jan-17 A	24-Dec-18	04-Jan-17	24-Dec-18	0	0
EM3137	Manufacturing & Logistic (Major Equipment)	160	25-Dec-18	02-Jun-19	25-Dec-18	02-Jun-19	0	0
EM3635	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3645	Manufacturing & Logistic (Penstock, Pipe & Valve)	126	25-Dec-18	29-Apr-19	25-Dec-18	29-Apr-19	0	0
EM3655	CMS Preparation, Submission & Approval (Electrical)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3665	Manufacturing & Logistic (Electrical)	84	25-Dec-18	18-Mar-19	25-Dec-18	18-Mar-19	0	0
EM3675	CMS Preparation, Submission & Approval (Building Services)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3685	Manufacturing & Logistic (Building Services)	120	25-Dec-18	23-Apr-19	25-Dec-18	23-Apr-19	0	0
Solid Handling Building (SHB)		742	12-Apr-17 A	23-Apr-19	12-Apr-17	23-Apr-19	0	0
EM3145	CMS Preparation, Submission & Approval (Major Equipment)	600	12-Apr-17 A	02-Dec-18	12-Apr-17	02-Dec-18	0	0
EM3150	Manufacturing & Logistic (Major Equipment)	48	04-Dec-18	20-Jan-19	04-Dec-18	20-Jan-19	0	0
EM3695	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3705	Manufacturing & Logistic (Penstock, Pipe & Valve)	35	28-Dec-18	31-Jan-19	28-Dec-18	31-Jan-19	0	0
EM3715	CMS Preparation, Submission & Approval (Electrical)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3725	Manufacturing & Logistic (Electrical)	84	25-Dec-18	18-Mar-19	25-Dec-18	18-Mar-19	0	0
EM3735	CMS Preparation, Submission & Approval (Building Services)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM3745	Manufacturing & Logistic (Building Services)	120	25-Dec-18	23-Apr-19	25-Dec-18	23-Apr-19	0	0
UV Disinfection Facility (UV)		547	21-Nov-17 A	21-May-19	21-Nov-17	21-May-19	0	0
EM3190	Manufacturing & Logistic (Major Equipment)	320	30-Apr-18 A	15-Mar-19	30-Apr-18	15-Mar-19	0	0
EM3192	Delivery To Site (Major Equipment)	96	10-Dec-18	15-Mar-19	10-Dec-18	15-Mar-19	0	0
EM3755	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	400	21-Nov-17 A	25-Dec-18	21-Nov-17	25-Dec-18	0	0
EM3765	Manufacturing & Logistic (Penstock, Pipe & Valve)	147	26-Dec-18	21-May-19	26-Dec-18	21-May-19	0	0
EM3775	CMS Preparation, Submission & Approval (Electrical)	400	21-Nov-17 A	25-Dec-18	21-Nov-17	25-Dec-18	0	0
EM3785	Manufacturing & Logistic (Electrical)	84	26-Dec-18	19-Mar-19	26-Dec-18	19-Mar-19	0	0
EM3795	CMS Preparation, Submission & Approval (Building Services)	415	21-Nov-17 A	09-Jan-19	21-Nov-17	09-Jan-19	0	0
EM3805	Manufacturing & Logistic (Building Services)	120	10-Jan-19	09-May-19	10-Jan-19	09-May-19	0	0
Sludge Dewatering Building (SDB)		940	27-Nov-16 A	24-Jun-19	27-Nov-16	24-Jun-19	0	0
EM3175	CMS Preparation, Submission & Approval (Major Equipment)	750	27-Nov-16 A	16-Dec-18	27-Nov-16	16-Dec-18	0	0
EM3180	Manufacturing & Logistic (Major Equipment)	190	17-Dec-18	24-Jun-19	17-Dec-18	24-Jun-19	0	0
EM3815	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	430	27-Oct-17 A	30-Dec-18	27-Oct-17	30-Dec-18	0	0
EM3825	Manufacturing & Logistic (Penstock, Pipe & Valve)	126	31-Dec-18	05-May-19	31-Dec-18	05-May-19	0	0
EM3835	CMS Preparation, Submission & Approval (Electrical)	420	27-Oct-17 A	20-Dec-18	27-Oct-17	20-Dec-18	0	0
EM3845	Manufacturing & Logistic (Electrical)	84	21-Dec-18	14-Mar-19	21-Dec-18	14-Mar-19	0	0



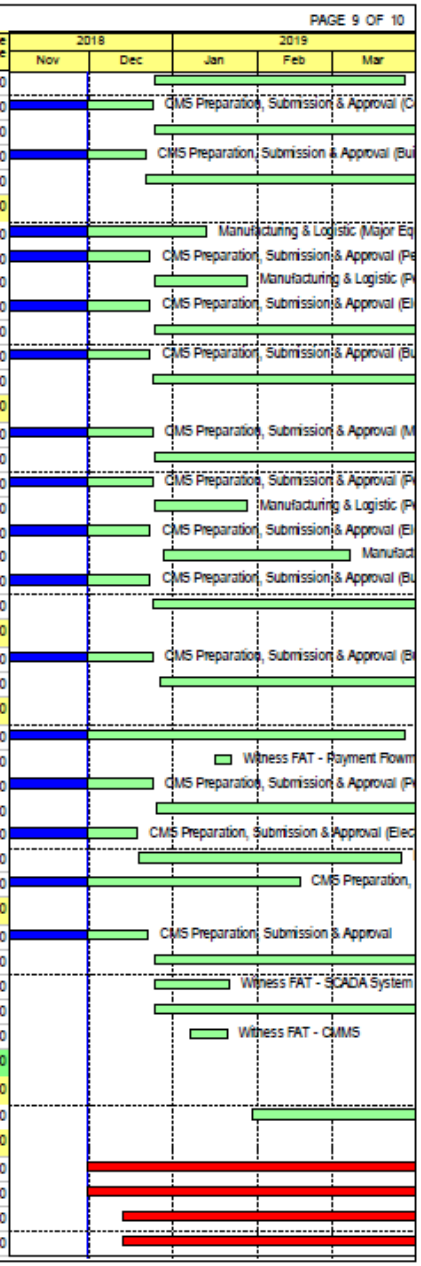
DATA DATE: 30-Nov-18 | LAYOUT: 5W Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
EM3855	CMS Preparation, Submission & Approval (Building Services)	441	27-Oct-17 A	10-Jan-19	27-Oct-17	10-Jan-19	0	0
EM3865	Manufacturing & Logistic (Building Services)	120	11-Jan-19	10-May-19	11-Jan-19	10-May-19	0	0
Sludge Skip Storage Building (SSSB)		557	04-Sep-17 A	14-Mar-19	04-Sep-17	14-Mar-19	0	0
EM3875	CMS Preparation, Submission & Approval (Electrical)	470	04-Sep-17 A	17-Dec-18	04-Sep-17	17-Dec-18	0	0
EM3885	Manufacturing & Logistic (Electrical)	84	21-Dec-18	14-Mar-19	21-Dec-18	14-Mar-19	0	0
EM3895	CMS Preparation, Submission & Approval (Building Services)	470	04-Sep-17 A	17-Dec-18	04-Sep-17	17-Dec-18	0	0
EM3905	Manufacturing & Logistic (Building Services)	32	18-Dec-18	18-Jan-19	18-Dec-18	18-Jan-19	0	0
Administration Building & Maintenance Workshop (AB & WS)		796	31-Jan-17 A	06-Apr-19	31-Jan-17	06-Apr-19	0	0
EM3125	CMS Preparation, Submission & Approval (Major Equipment)	680	31-Jan-17 A	11-Dec-18	31-Jan-17	11-Dec-18	0	0
EM3130	Manufacturing & Logistic (Major Equipment)	115	13-Dec-18	06-Apr-19	13-Dec-18	06-Apr-19	0	0
EM3915	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	470	30-Aug-17 A	12-Dec-18	30-Aug-17	12-Dec-18	0	0
EM3925	Manufacturing & Logistic (Penstock, Pipe & Valve)	98	16-Dec-18	23-Mar-19	16-Dec-18	23-Mar-19	0	0
EM3935	CMS Preparation, Submission & Approval (Electrical)	470	30-Aug-17 A	12-Dec-18	30-Aug-17	12-Dec-18	0	0
EM3945	Manufacturing & Logistic (Electrical)	98	13-Dec-18	20-Mar-19	13-Dec-18	20-Mar-19	0	0
EM3955	CMS Preparation, Submission & Approval (Building Services)	470	30-Aug-17 A	12-Dec-18	30-Aug-17	12-Dec-18	0	0
EM3965	Manufacturing & Logistic (Building Services)	98	13-Dec-18	20-Mar-19	13-Dec-18	20-Mar-19	0	0
Deodorization Facilities No. 1 & 2 (DO 1 & DO 2)		828	10-Jan-17 A	17-Apr-19	10-Jan-17	17-Apr-19	0	0
EM3165	CMS Preparation, Submission & Approval (Major Equipment)	700	10-Jan-17 A	10-Dec-18	10-Jan-17	10-Dec-18	0	0
EM3170	Manufacturing & Logistic (Major Equipment)	32	12-Dec-18	12-Jan-19	12-Dec-18	12-Jan-19	0	0
EM3171	Witness FAT - DO 1 & DO 2	14	22-Dec-18	04-Jan-19	22-Dec-18	04-Jan-19	0	0
EM3172	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	470	30-Aug-17 A	12-Dec-18	30-Aug-17	12-Dec-18	0	0
EM3173	Manufacturing & Logistic (Penstock, Pipe & Valve)	126	13-Dec-18	17-Apr-19	13-Dec-18	17-Apr-19	0	0
EM3975	CMS Preparation, Submission & Approval (Electrical)	470	30-Aug-17 A	12-Dec-18	30-Aug-17	12-Dec-18	0	0
EM3985	Manufacturing & Logistic (Electrical)	98	13-Dec-18	20-Mar-19	13-Dec-18	20-Mar-19	0	0
EM3995	CMS Preparation, Submission & Approval (Building Services)	526	30-Aug-17 A	06-Feb-19	30-Aug-17	06-Feb-19	0	0
Chemical Building (CB)		530	08-Nov-17 A	21-Apr-19	08-Nov-17	21-Apr-19	0	0
EM3230	Manufacturing & Logistic (Major Equipment)	290	17-Mar-18 A	31-Dec-18	17-Mar-18	31-Dec-18	0	0
EM4015	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	410	08-Nov-17 A	22-Dec-18	08-Nov-17	22-Dec-18	0	0
EM4025	Manufacturing & Logistic (Penstock, Pipe & Valve)	35	23-Dec-18	26-Jan-19	23-Dec-18	26-Jan-19	0	0
EM4035	CMS Preparation, Submission & Approval (Electrical)	410	08-Nov-17 A	22-Dec-18	08-Nov-17	22-Dec-18	0	0
EM4045	Manufacturing & Logistic (Electrical)	98	23-Dec-18	30-Mar-19	23-Dec-18	30-Mar-19	0	0
EM4055	CMS Preparation, Submission & Approval (Building Services)	410	08-Nov-17 A	22-Dec-18	08-Nov-17	22-Dec-18	0	0
EM4065	Manufacturing & Logistic (Building Services)	120	23-Dec-18	21-Apr-19	23-Dec-18	21-Apr-19	0	0
Street Fire Hydrant Pump Room & GENSET Room (FH)		764	23-Mar-17 A	25-Apr-19	23-Mar-17	25-Apr-19	0	0
EM3275	CMS Preparation, Submission & Approval (Major Equipment)	640	23-Mar-17 A	22-Dec-18	23-Mar-17	22-Dec-18	0	0
EM3280	Manufacturing & Logistic (Major Equipment)	84	23-Dec-18	16-Mar-19	23-Dec-18	16-Mar-19	0	0
EM4075	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	446	01-Oct-17 A	20-Dec-18	01-Oct-17	20-Dec-18	0	0
EM4085	Manufacturing & Logistic (Penstock, Pipe & Valve)	126	21-Dec-18	25-Apr-19	21-Dec-18	25-Apr-19	0	0
EM4095	CMS Preparation, Submission & Approval (Electrical)	450	01-Oct-17 A	24-Dec-18	01-Oct-17	24-Dec-18	0	0
EM4105	Manufacturing & Logistic (Electrical)	98	25-Dec-18	01-Apr-19	25-Dec-18	01-Apr-19	0	0
EM4115	CMS Preparation, Submission & Approval (Building Services)	439	01-Oct-17 A	13-Dec-18	01-Oct-17	13-Dec-18	0	0
EM4125	Manufacturing & Logistic (Building Services)	120	14-Dec-18	12-Apr-19	14-Dec-18	12-Apr-19	0	0
Electrical Buildings (EB1, EB2, EB3 & EB4)		779	23-Feb-17 A	12-Apr-19	23-Feb-17	12-Apr-19	0	0
EM3235	CMS Preparation, Submission & Approval (Major Equipment)	670	23-Feb-17 A	24-Dec-18	23-Feb-17	24-Dec-18	0	0
EM3240	Manufacturing & Logistic (Major Equipment)	84	27-Dec-18	20-Mar-19	27-Dec-18	20-Mar-19	0	0
EM3245	Witness FAT - LV Switchboards (8 nos. for EB's and 4 nos. for SDB)	21	10-Jan-19	30-Jan-19	10-Jan-19	30-Jan-19	0	0
EM3300	CMS Preparation, Submission & Approval (Electrical)	470	11-Sep-17 A	24-Dec-18	11-Sep-17	24-Dec-18	0	0



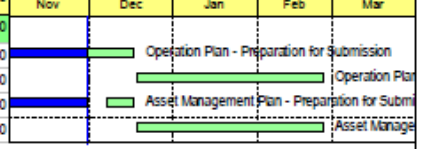
DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) | PAGE 9 OF 10

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
EM3305	Manufacturing & Logistic (Electrical)	93	25-Dec-18	27-Mar-19	25-Dec-18	27-Mar-19	0	0
EM3310	CMS Preparation, Submission & Approval (Control & Instrument)	470	11-Sep-17 A	24-Dec-18	11-Sep-17	24-Dec-18	0	0
EM3315	Manufacturing & Logistic (Control & Instrument)	98	25-Dec-18	01-Apr-19	25-Dec-18	01-Apr-19	0	0
EM3320	CMS Preparation, Submission & Approval (Building Services)	500	09-Aug-17 A	21-Dec-18	09-Aug-17	21-Dec-18	0	0
EM3325	Manufacturing & Logistic (Building Services)	112	22-Dec-18	12-Apr-19	22-Dec-18	12-Apr-19	0	0
Re-use Water Building (RW)		512	19-Nov-17 A	14-Apr-19	19-Nov-17	14-Apr-19	0	0
EM3200	Manufacturing & Logistic (Major Equipment)	200	28-Jun-18 A	13-Jan-19	28-Jun-18	13-Jan-19	0	0
EM4135	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	400	19-Nov-17 A	23-Dec-18	19-Nov-17	23-Dec-18	0	0
EM4145	Manufacturing & Logistic (Penstock, Pipe & Valve)	35	25-Dec-18	28-Jan-19	25-Dec-18	28-Jan-19	0	0
EM4155	CMS Preparation, Submission & Approval (Electrical)	400	19-Nov-17 A	23-Dec-18	19-Nov-17	23-Dec-18	0	0
EM4165	Manufacturing & Logistic (Electrical)	98	25-Dec-18	01-Apr-19	25-Dec-18	01-Apr-19	0	0
EM4175	CMS Preparation, Submission & Approval (Building Services)	400	19-Nov-17 A	23-Dec-18	19-Nov-17	23-Dec-18	0	0
EM4185	Manufacturing & Logistic (Building Services)	112	24-Dec-18	14-Apr-19	24-Dec-18	14-Apr-19	0	0
DG Store & Chemical Waste Storage Building (DG) and Irrigation & Cleansing Water Pump Room (ICW)		691	24-May-17 A	14-Apr-19	24-May-17	14-Apr-19	0	0
EM3255	CMS Preparation, Submission & Approval (Major Equipment)	580	24-May-17 A	24-Dec-18	24-May-17	24-Dec-18	0	0
EM3260	Manufacturing & Logistic (Major Equipment)	98	25-Dec-18	01-Apr-19	25-Dec-18	01-Apr-19	0	0
EM4195	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	380	10-Dec-17 A	24-Dec-18	10-Dec-17	24-Dec-18	0	0
EM4205	Manufacturing & Logistic (Penstock, Pipe & Valve)	35	25-Dec-18	28-Jan-19	25-Dec-18	28-Jan-19	0	0
EM4215	CMS Preparation, Submission & Approval (Electrical)	450	30-Sep-17 A	23-Dec-18	30-Sep-17	23-Dec-18	0	0
EM4225	Manufacturing & Logistic (Electrical)	70	28-Dec-18	07-Mar-19	28-Dec-18	07-Mar-19	0	0
EM4235	CMS Preparation, Submission & Approval (Building Services)	450	30-Sep-17 A	23-Dec-18	30-Sep-17	23-Dec-18	0	0
EM4245	Manufacturing & Logistic (Building Services)	112	24-Dec-18	14-Apr-19	24-Dec-18	14-Apr-19	0	0
Gatehouse (GH)		710	24-Apr-17 A	03-Apr-19	24-Apr-17	03-Apr-19	0	0
EM3285	CMS Preparation, Submission & Approval (Building Services)	610	24-Apr-17 A	24-Dec-18	24-Apr-17	24-Dec-18	0	0
EM3290	Manufacturing & Logistic (Building Services)	98	27-Dec-18	03-Apr-19	27-Dec-18	03-Apr-19	0	0
Payment Flowmeter Chamber (PF)		579	01-Sep-17 A	02-Apr-19	01-Sep-17	02-Apr-19	0	0
EM3210	Manufacturing & Logistic (Major Equipment)	181	28-Sep-18 A	27-Mar-19	28-Sep-18	27-Mar-19	0	0
EM3211	Witness FAT - Payment Flowmeter and Reference Flowmeter	7	16-Jan-19	22-Jan-19	16-Jan-19	22-Jan-19	0	0
EM4255	CMS Preparation, Submission & Approval (Penstock, Pipe & Valve)	480	01-Sep-17 A	24-Dec-18	01-Sep-17	24-Dec-18	0	0
EM4265	Manufacturing & Logistic (Penstock, Pipe & Valve)	98	26-Dec-18	02-Apr-19	26-Dec-18	02-Apr-19	0	0
EM4275	CMS Preparation, Submission & Approval (Electrical)	394	20-Nov-17 A	18-Dec-18	20-Nov-17	18-Dec-18	0	0
EM4285	Manufacturing & Logistic (Electrical)	98	19-Dec-18	26-Mar-19	19-Dec-18	26-Mar-19	0	0
EM4295	CMS Preparation, Submission & Approval (Building Services)	454	20-Nov-17 A	16-Feb-19	20-Nov-17	16-Feb-19	0	0
SCADA and CMMS Systems		654	01-Jul-17 A	15-Apr-19	01-Jul-17	15-Apr-19	0	0
EM3330	CMS Preparation, Submission & Approval	540	01-Jul-17 A	22-Dec-18	01-Jul-17	22-Dec-18	0	0
EM3335	Manufacturing & Logistic (SCADA)	112	25-Dec-18	15-Apr-19	25-Dec-18	15-Apr-19	0	0
EM3340	Witness FAT - SCADA System	28	25-Dec-18	21-Jan-19	25-Dec-18	21-Jan-19	0	0
EM3345	Manufacturing & Logistic (CMMS)	112	25-Dec-18	15-Apr-19	25-Dec-18	15-Apr-19	0	0
EM3350	Witness FAT - CMMS	14	07-Jan-19	20-Jan-19	07-Jan-19	20-Jan-19	0	0
Installation		271	30-Nov-18	27-Aug-19	30-Nov-18	27-Aug-19	0	0
Sludge Dewatering Building (SDB)		210	30-Jan-19	27-Aug-19	30-Jan-19	27-Aug-19	0	0
EM1800	Plant (Mechanical) Installation	210	30-Jan-19	27-Aug-19	30-Jan-19	27-Aug-19	0	0
Administration Building & Maintenance Workshop (AB & WS)		193	30-Nov-18	10-Jun-19	30-Nov-18	10-Jun-19	0	0
EM1100	SCADA System	180	30-Nov-18	28-May-19	30-Nov-18	28-May-19	0	0
EM1105	Plant Installation (WS)	180	30-Nov-18	28-May-19	30-Nov-18	28-May-19	0	0
EM1110	ELV System	180	13-Dec-18	10-Jun-19	13-Dec-18	10-Jun-19	0	0
EM1120	BS - MVAC Installation	180	13-Dec-18	10-Jun-19	13-Dec-18	10-Jun-19	0	0



DATA DATE: 30-Nov-18 | LAYOUT: SW Project PHase 1 Rev 10 (3M 30Nov18) |

Activity ID	Activity Name	At Completion Duration	Start	Finish	Rev 10 BL Start	Rev 10 BL Finish	Slippage Start Date	Slippage Finish Date
Testing & Commissioning		268	03-Jun-18 A	25-Feb-19	03-Jun-18	25-Feb-19	0	0
TC030	Operation Plan - Preparation for Submission	198	03-Jun-18 A	17-Dec-18	03-Jun-18	17-Dec-18	0	0
TC035	Operation Plan - Submission to SO for Review and Approval	70	18-Dec-18	25-Feb-19	18-Dec-18	25-Feb-19	0	0
TC040	Asset Management Plan - Preparation for Submission	198	03-Jun-18 A	17-Dec-18	03-Jun-18	17-Dec-18	0	0
TC045	Asset Management Plan - Submission to SO for Review and Approval	70	18-Dec-18	25-Feb-19	18-Dec-18	25-Feb-19	0	0



Appendix D1

Calibration Certificates for Impact Air Quality Monitoring Equipment

TISCH Environmental

RECALIBRATION DUE DATE:
March 21, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	March 21, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K
Operator:	Jim Tisch		**Pa:** 756.9	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **3480**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4200	3.2	2.00
2	3	4	1	1.0000	6.4	4.00
3	5	6	1	0.8950	7.9	5.00
4	7	8	1	0.8570	8.8	5.50
5	9	10	1	0.7070	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)
1.0087	0.7103	1.4233	0.9958	0.7012	0.8799
1.0044	1.0044	2.0129	0.9915	0.9915	1.2443
1.0024	1.1200	2.2505	0.9896	1.1057	1.3912
1.0012	1.1682	2.3603	0.9884	1.1533	1.4591
0.9959	1.4087	2.8467	0.9832	1.3907	1.7598
QSTD	**m=**	**2.04113**	**QA**	**m=**	**1.27812**
	b=	**-0.03040**		**b=**	**-0.01879**
	r=	**0.99994**		**r=**	**0.99994**

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.
145 South Miami Avenue
Village of Cleves, OH 45002

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

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW

Date of Calibration : 27 October 2018

Serial No. : 1934 (ET / EA / 003 / 25)

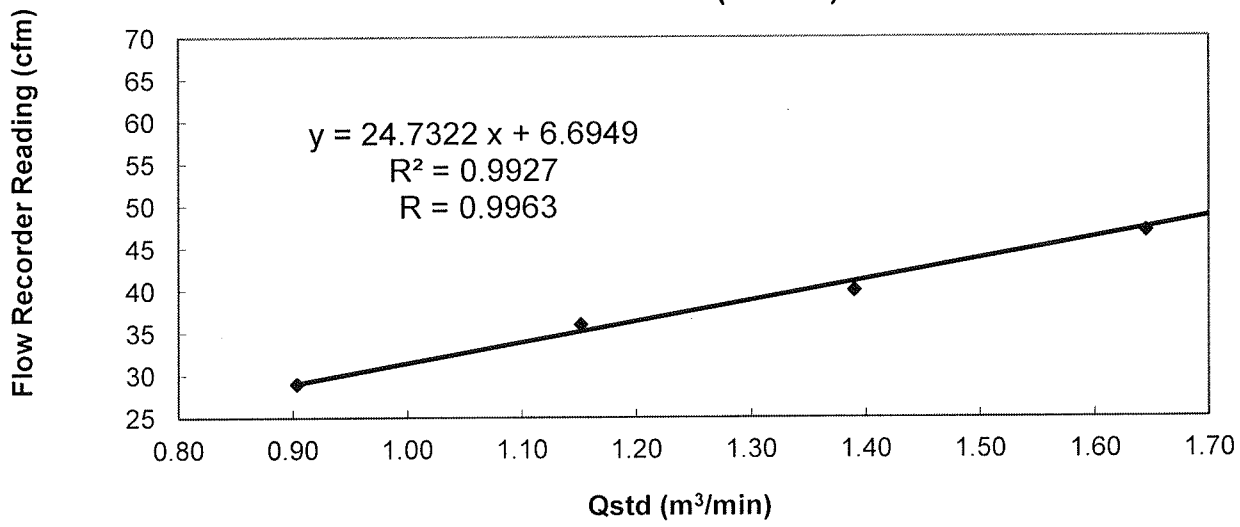
Calibration Due Date : 26 December 2018

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	52	47	40	36	29
Qstd (Actual flow rate, m^3/min)	1.81	1.64	1.39	1.15	0.90
Pressure : 767.31 **mm Hg**		Temp. : 302 K			

Sampler 1934 Calibration Curve
Site: San Wai (ASR1a)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies* / ~~does not comply~~* with the specified requirements and is deemed acceptable* / ~~unacceptable~~* for use.

Calibrated by : Mak Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Approved by :
LAU, Chi Leung
(Environmental Team Leader)

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby (Model No. GS2310) Date of Calibration : 27 October 2018

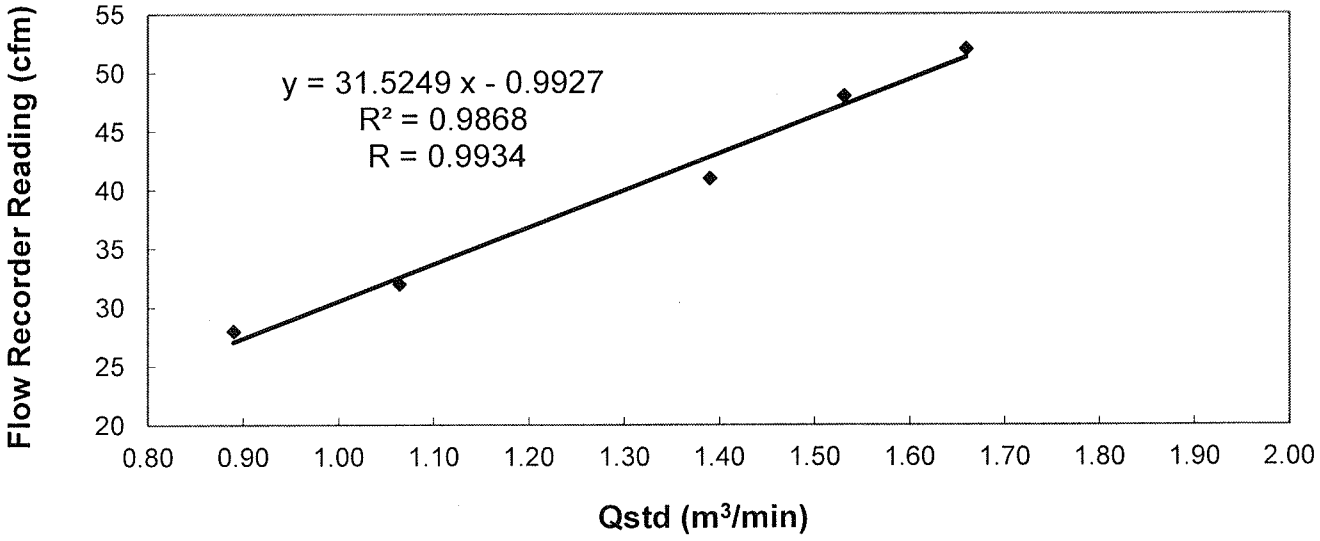
Serial No. : 9998 (ET / EA / 003 / 12) Calibration Due Date : 26 December 2018

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	52	48	41	32	28
Qstd (Actual flow rate, m^3/min)	1.66	1.53	1.39	1.06	0.89
Pressure : 767.31 mm Hg		Temp. : 302 K			

Sampler 9998 Calibration Curve
Site: San Wai (ASR2a)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies* / ~~does not comply~~* with the specified requirements and is deemed acceptable* / ~~unacceptable~~* for use.

Calibrated by : Mak Kei Wai
MAK, Kei Wai
(Assistant Supervisor)

Checked by :
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Internal Calibration Report of Dust Monitor

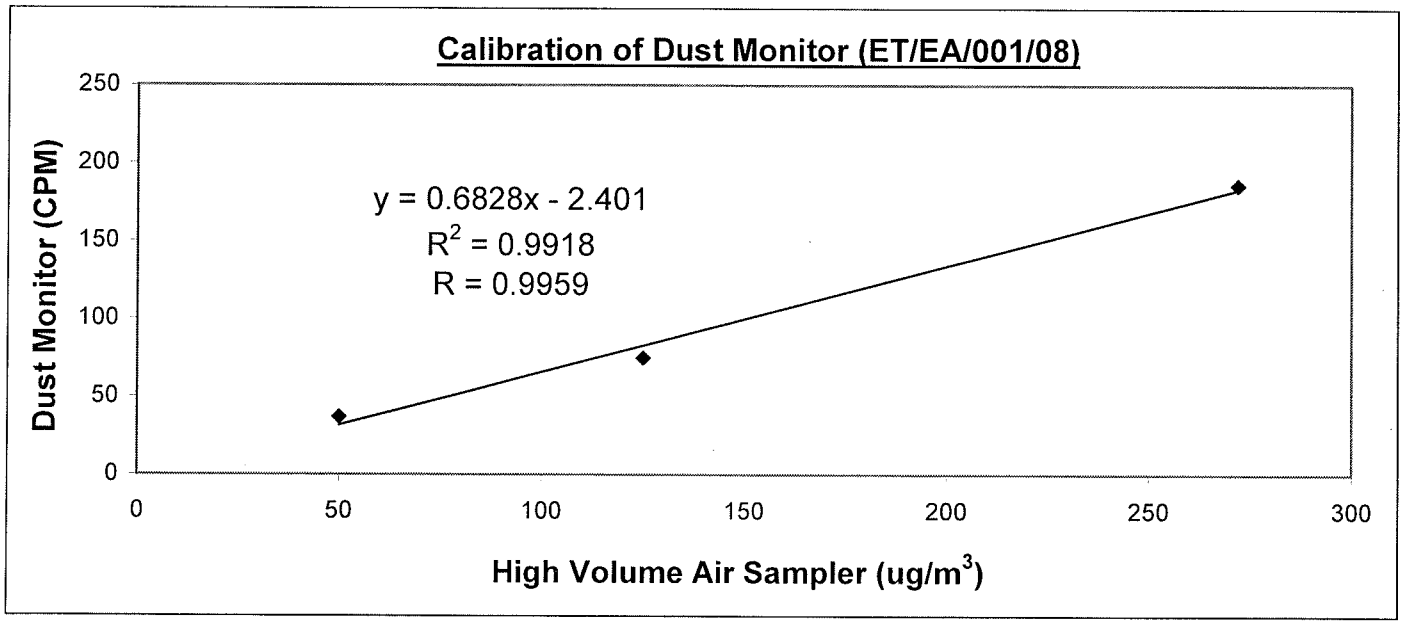
Manufacturer : SIBATA (LD-3B) Date of Calibration : 22 September 2018

Serial No. : 135261 (ET/EA/001/08) Calibration Due Date : 21 March 2019

Method : Parallel measurement (Three-point calibration) by placing the Dust Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Monitor (CPM)	37	75	186
High Volume Air Sampler (ug/m^3)	50	125	272
High Volume Air Sampler Serail No.:1177	Calibration Due Date: 2 October 2018		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after three-pointcalibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
Li Lok Yin
(Technician)

Checked by : _____
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Internal Calibration Report of Dust Monitor

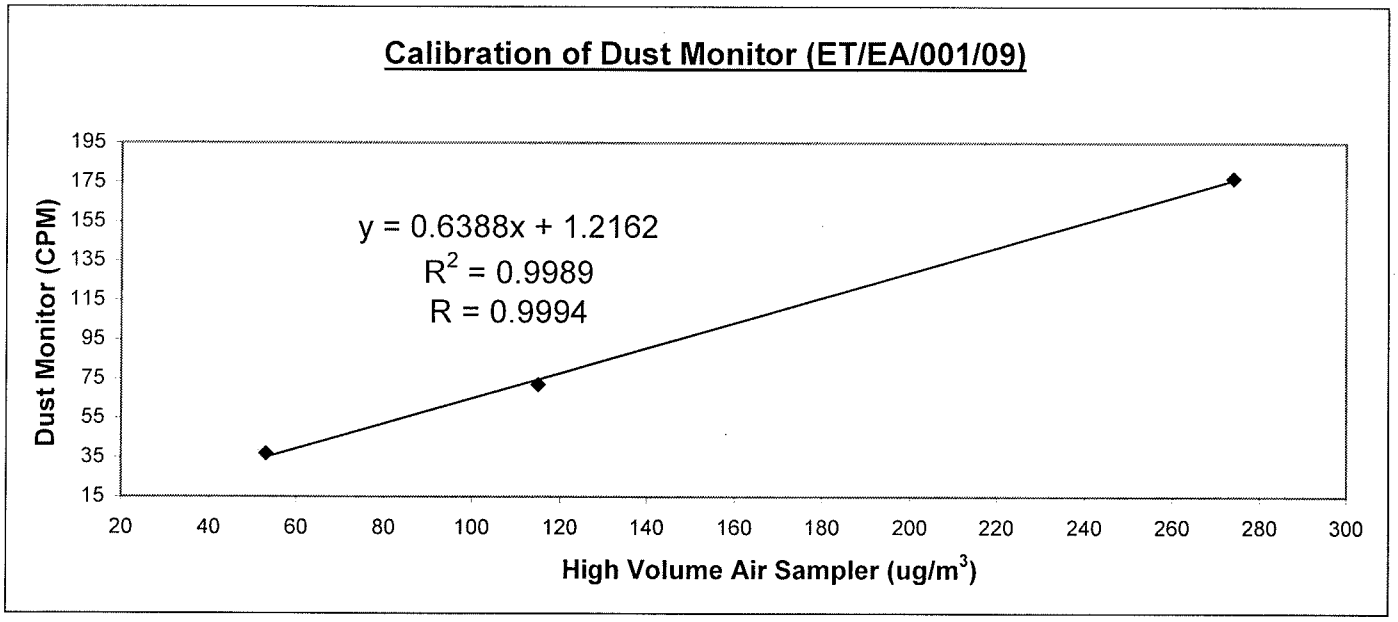
Manufacturer : SIBATA (LD-3B) Date of Calibration : 18 October 2018

Serial No. : 155331 (ET/EA/001/09) Calibration Due Date : 17 April 2019

Method : Parallel measurement (Three-point calibration) by placing the Dust Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Monitor (CPM)	37	72	177
High Volume Air Sampler (ug/m^3)	53	115	274
High Volume Air Sampler Serail No.: 1177	Calibration Due Date: 1 December 2018		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a three-point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
LI, Lok Yin
(Technician)

Checked by : _____
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Internal Calibration Report of Dust Monitor

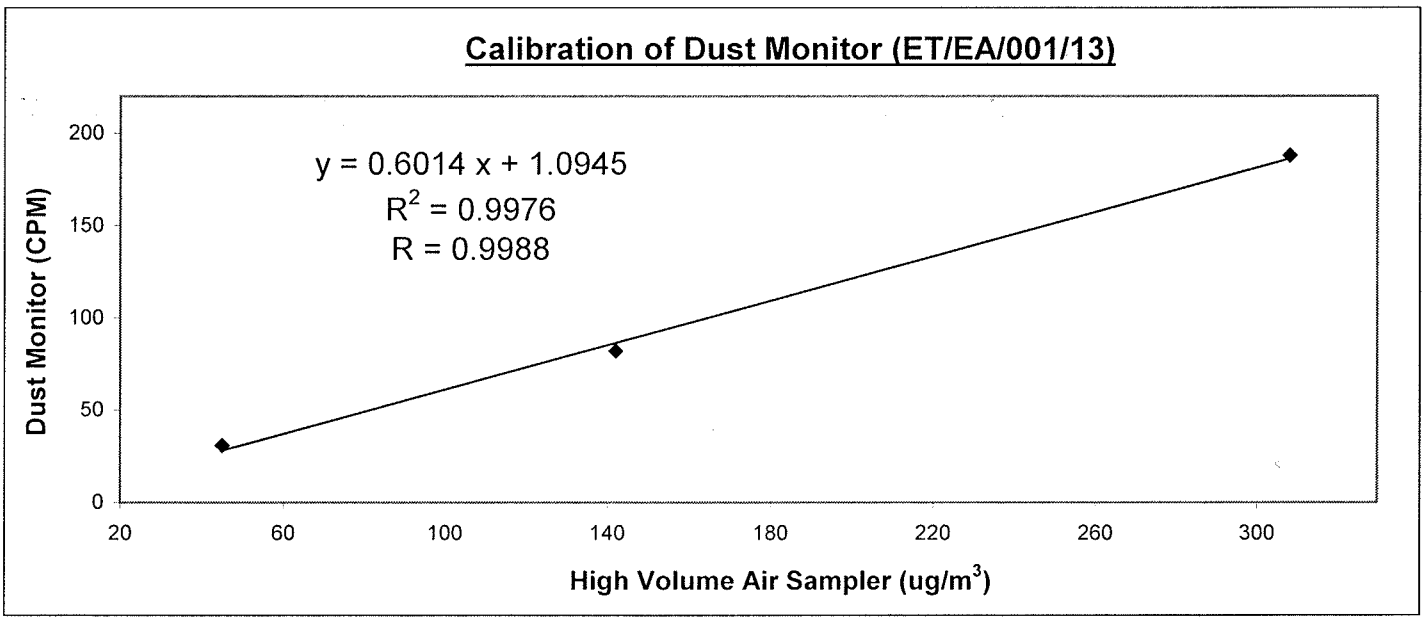
Manufacturer : SIBATA (LD-5) Date of Calibration : 20 June 2018

Serial No. : 4Y1613 (ET/EA/001/13) Calibration Due Date : 19 December 2018

Method : Parallel measurement (Three-point calibration) by placing the Dust Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Monitor (CPM)	31	82	188
High Volume Air Sampler (ug/m^3)	45	142	308
High Volume Air Sampler Serail No.: 1177	Calibration Due Date: 3 August 2018		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a three-point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
CHUNG, Ka Ho
(Technician)

Checked by : _____
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Internal Calibration Report of Dust Monitor

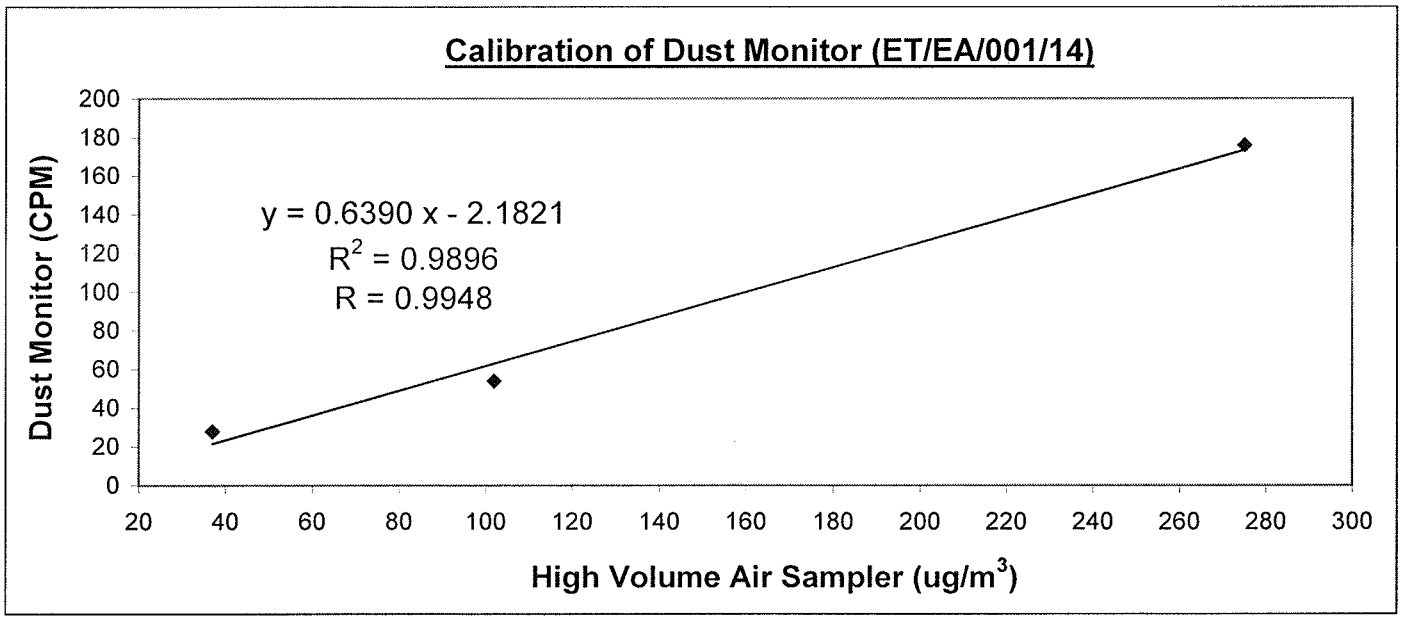
Manufacturer : SIBATA (LD-3B) Date of Calibration : 07 September 2018

Serial No. : 597340 (ET/EA/001/14) Calibration Due Date : 06 March 2019

Method : Parallel measurement (Three-point calibration) by placing the Dust Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Monitor (CPM)	28	54	176
High Volume Air Sampler (ug/m^3)	37	102	275
High Volume Air Sampler Serail No.: 1177	Calibration Due Date: 2 October 2018		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a three-point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
LI, Lok Yin
(Technician)

Checked by : _____
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

Internal Calibration Report of Dust Monitor

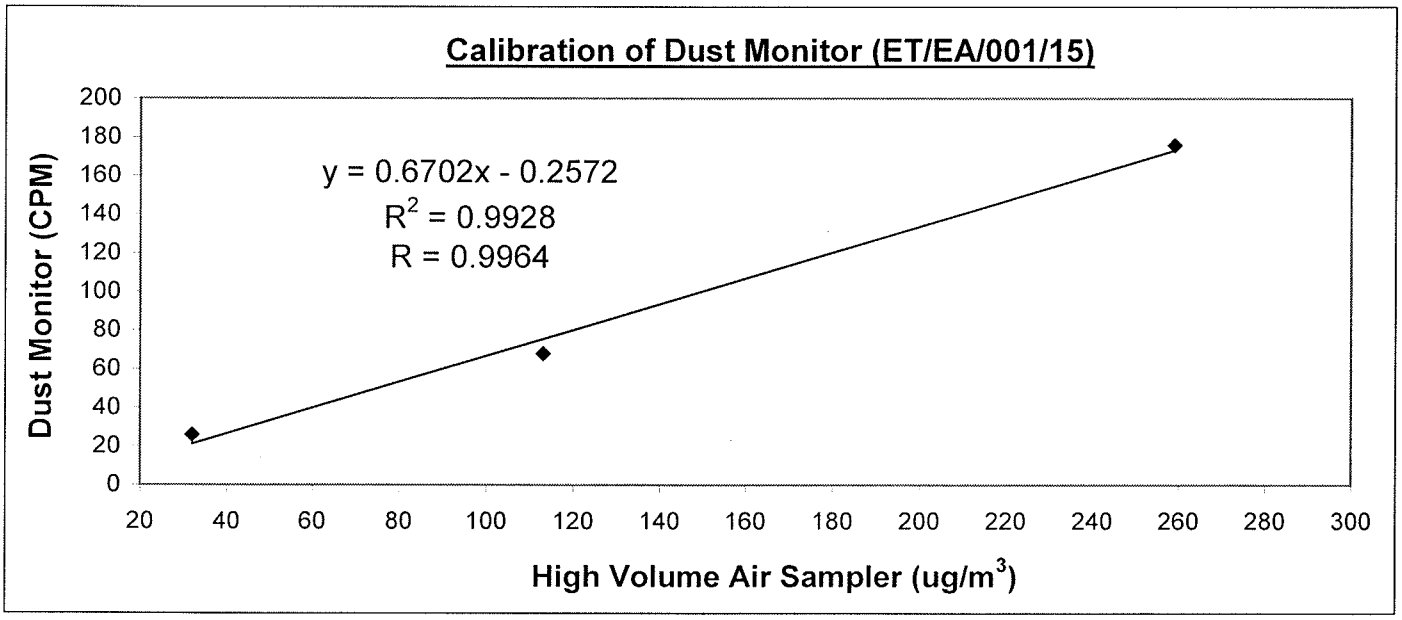
Manufacturer : SIBATA (LD-3B) Date of Calibration : 19 July 2018

Serial No. : 597227 (ET/EA/001/15) Calibration Due Date : 18 Jan 2019

Method : Parallel measurement (Three-point calibration) by placing the Dust Monitor and High Volume Air Samper together under the same environmental condition

Results :

Dust Monitor (CPM)	26	68	176
High Volume Air Sampler (ug/m^3)	32	113	259
High Volume Air Sampler Serail No.: 1177	Calibration Due Date: 3 August 2018		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a three-point calibration

The Dust Trak Monitor complies * / ~~does not comply~~ * with the internal calibration procedures and is deemed acceptable */ ~~unacceptable~~ * for use.

Calibrated by : _____
CHUNG, Ka Ho
(Technician)

Checked by : _____
LAU, Chi Leung
(Environmental Team Leader)

- END OF REPORT -

Appendix D2

Impact Air Quality Monitoring Results

Summary of Impact 1-hour TSP Monitoring Results

Air Quality Monitoring Station : ASR1a

Date	Weather	Temperature (℃)	Monitoring Period		1-hr TSP ($\mu g/m^3$)
			Start	Finish	
02/11/2018	Cloudy	25	13:00	14:00	75
02/11/2018	Cloudy	25	14:00	15:00	73
02/11/2018	Cloudy	25	15:00	16:00	73
08/11/2018	Cloudy	24	09:15	10:15	72
08/11/2018	Cloudy	24	10:15	11:15	81
08/11/2018	Cloudy	24	13:00	14:00	69
14/11/2018	Cloudy	23	09:30	10:30	83
14/11/2018	Cloudy	23	10:30	11:30	75
14/11/2018	Cloudy	23	13:05	14:05	68
20/11/2018	Cloudy	20	08:09	09:09	93
20/11/2018	Cloudy	21	09:09	10:09	72
20/11/2018	Cloudy	23	13:00	14:00	59
26/11/2018	Cloudy	20	13:58	14:58	93
26/11/2018	Cloudy	20	14:58	15:58	91
26/11/2018	Cloudy	21	15:58	16:58	57
				Min	57
				Max	93
				Average	76

Air Quality Monitoring Station : ASR2b

Date	Weather	Temperature (℃)	Monitoring Period		1-hr TSP ($\mu g/m^3$)
			Start	Finish	
02/11/2018	Cloudy	25	09:00	10:00	68
02/11/2018	Cloudy	25	10:00	11:00	63
02/11/2018	Cloudy	25	11:00	12:00	65
08/11/2018	Cloudy	25	14:10	15:10	89
08/11/2018	Cloudy	25	15:10	16:10	83
08/11/2018	Cloudy	25	16:10	17:10	76
14/11/2018	Cloudy	24	14:25	15:25	91
14/11/2018	Cloudy	25	15:25	16:25	82
14/11/2018	Cloudy	25	16:25	17:25	72
20/11/2018	Cloudy	20	08:17	09:17	94
20/11/2018	Cloudy	21	09:17	10:17	66
20/11/2018	Cloudy	23	10:17	11:17	59
26/11/2018	Cloudy	20	14:03	15:03	47
26/11/2018	Cloudy	20	15:03	16:03	50
26/11/2018	Cloudy	21	16:03	17:03	55
				Min	47
				Max	94
				Average	71

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Summary of Impact 24-hour TSP Monitoring Results

Air Quality Monitoring Station : ASR1a

Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m^3/min.)		Average (m^3/min.)	Filter Paper Weight (g)		Conc. ($\mu g/m^3$)	Weather Condition
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final		
02/11/2018	13:10	03/11/2018	13:10	25061.64	25085.64	24	1.0232	1.0232	1.0232	2.6431	2.7565	77	Cloudy
08/11/2018	09:20	09/11/2018	09:20	25085.64	25109.64	24	1.0232	1.0232	1.0232	2.6341	2.7387	71	Cloudy
14/11/2018	09:35	15/11/2018	09:35	25109.64	25133.64	24	1.0232	1.0232	1.0232	2.6563	2.7771	82	Cloudy
20/11/2018	09:00	21/11/2018	09:00	25133.64	25157.64	24	1.1040	1.1040	1.1040	2.6330	2.7570	78	Cloudy
26/11/2018	14:00	27/11/2018	14:00	25157.64	25181.64	24	1.1040	1.1040	1.1040	2.6543	2.7910	86	Cloudy

Min	71
Max	86
Average	79

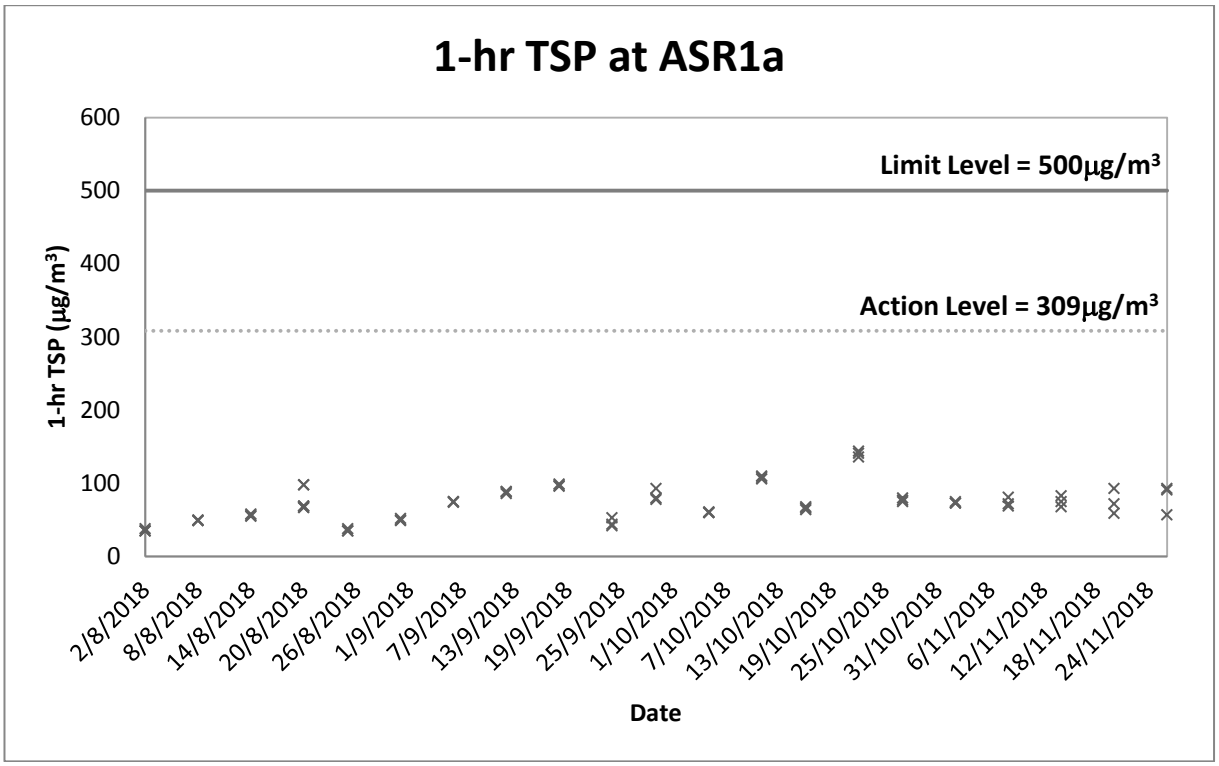
Air Quality Monitoring Station : ASR2b

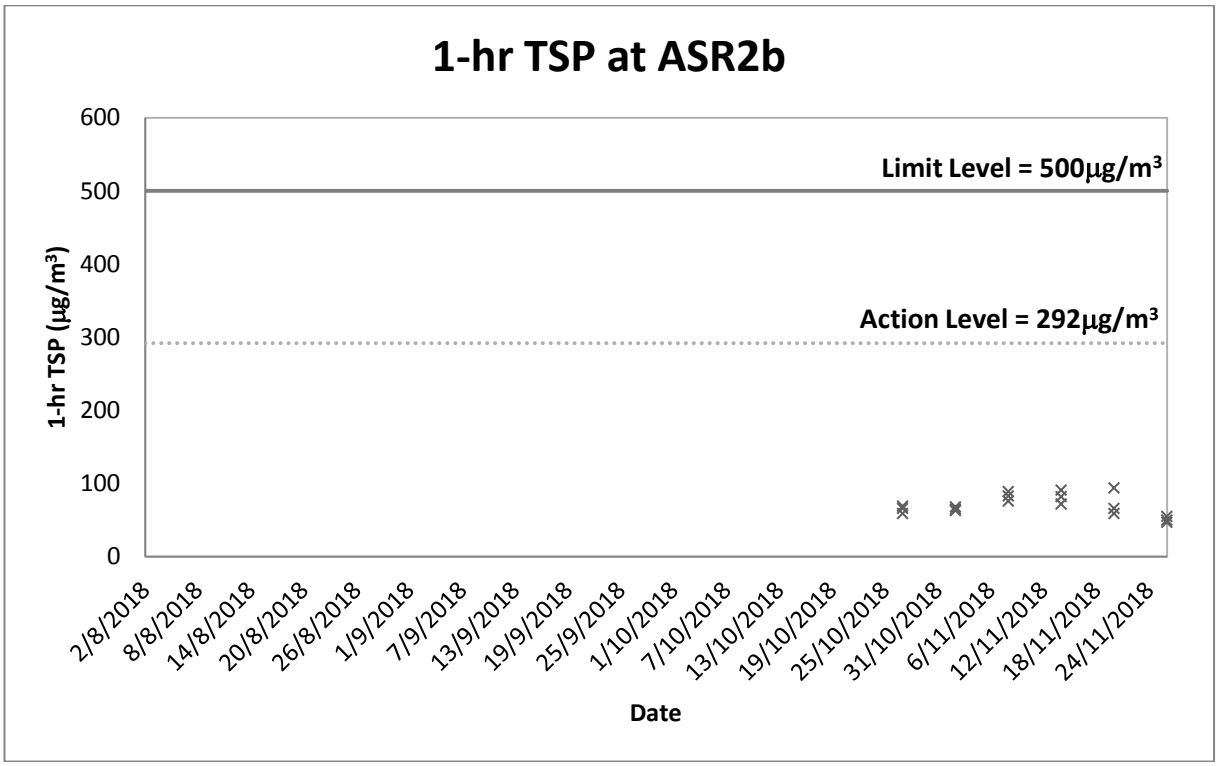
Start		Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m^3/min.)		Average (m^3/min.)	Filter Paper Weight (g)		Conc. ($\mu g/m^3$)	Weather Condition
Date	Time	Date	Time	Initial	Final		Initial	Final		Initial	Final		
02/11/2018	09:10	03/11/2018	09:10	21806.45	21830.45	24	1.1100	1.1100	1.1100	2.6767	2.7742	61	Cloudy
08/11/2018	14:10	09/11/2018	14:10	21830.45	21854.45	24	1.1100	1.1100	1.1100	2.6472	2.7510	65	Cloudy
14/11/2018	14:30	15/11/2018	14:30	21854.45	21878.45	24	1.0466	1.0466	1.0466	2.6852	2.7906	70	Cloudy
20/11/2018	09:20	21/11/2018	09:20	21878.45	21902.45	24	1.0466	1.0466	1.0466	2.6308	2.7423	74	Cloudy
26/11/2018	14:05	27/11/2018	14:05	21902.45	21926.45	24	1.0466	1.0466	1.0466	2.6372	2.7577	80	Cloudy

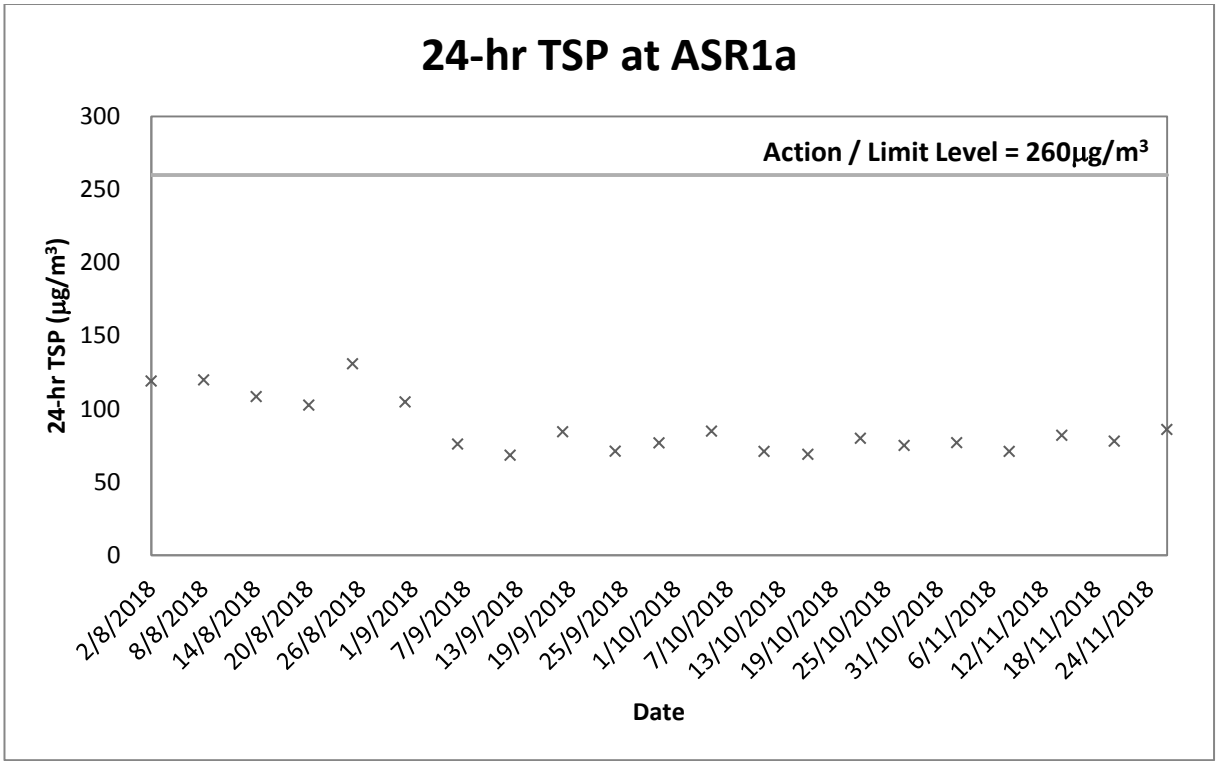
Min	61
Max	80
Average	70

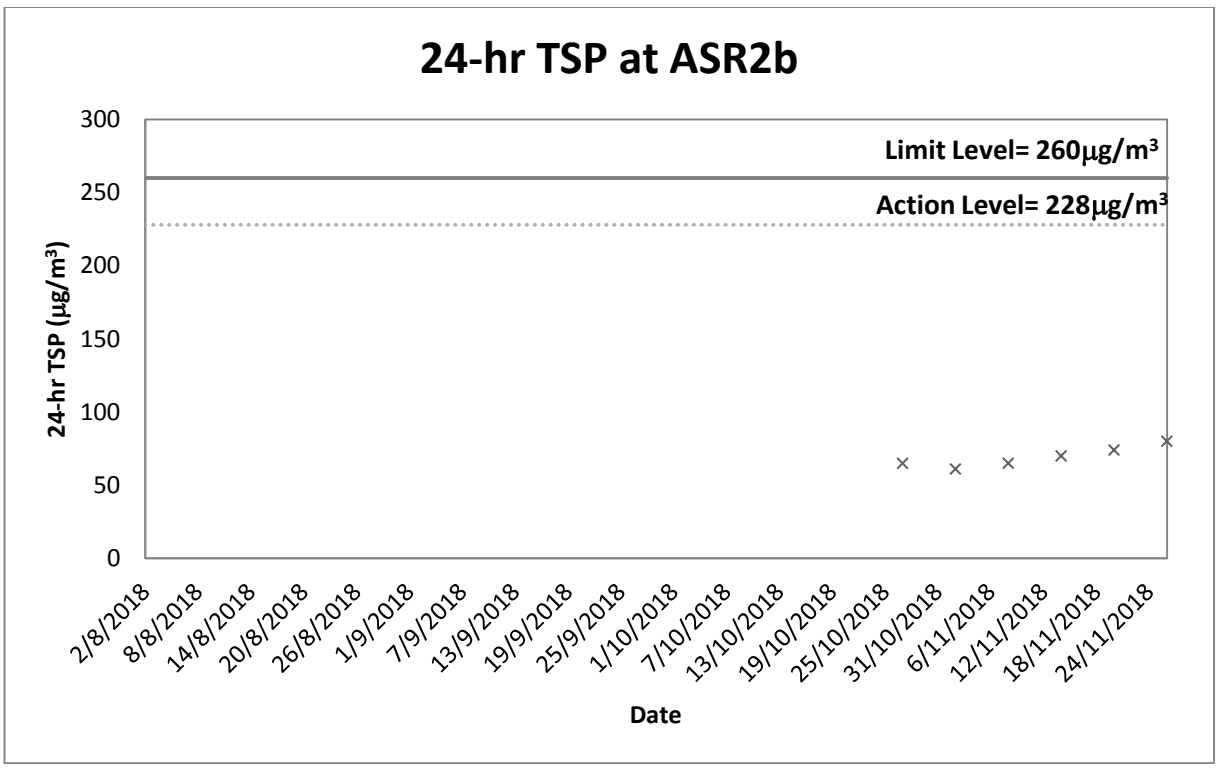
Appendix D3

Graphical Plots of Impact Air Quality Monitoring Results


1-hr TSP at ASR1a
Limit Level = 500μg/m³
Action Level = 309μg/m³
1-hr TSP (μg/m³)
600
500
400
300
200
100
0
2/8/2018
8/8/2018
14/8/2018
20/8/2018
26/8/2018
1/9/2018
7/9/2018
13/9/2018
19/9/2018
25/9/2018
1/10/2018
7/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
6/11/2018
12/11/2018
18/11/2018
24/11/2018
Date


1-hr TSP at ASR2b
Limit Level = 500μg/m³
Action Level = 292μg/m³
1-hr TSP (μg/m³)
600
500
400
300
200
100
0
2/8/2018
8/8/2018
14/8/2018
20/8/2018
26/8/2018
1/9/2018
7/9/2018
13/9/2018
19/9/2018
25/9/2018
1/10/2018
7/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
6/11/2018
12/11/2018
18/11/2018
24/11/2018
Date


24-hr TSP at ASR1a
Action / Limit Level = 260μg/m³
24-hr TSP (μg/m³)
300
250
200
150
100
50
0
2/8/2018
8/8/2018
14/8/2018
20/8/2018
26/8/2018
1/9/2018
7/9/2018
13/9/2018
19/9/2018
25/9/2018
1/10/2018
7/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
6/11/2018
12/11/2018
18/11/2018
24/11/2018
Date


24-hr TSP at ASR2b
Limit Level= 260μg/m³
Action Level= 228μg/m³
24-hr TSP (μg/m³)
300
250
200
150
100
50
0
2/8/2018
8/8/2018
14/8/2018
20/8/2018
26/8/2018
1/9/2018
7/9/2018
13/9/2018
19/9/2018
25/9/2018
1/10/2018
7/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
6/11/2018
12/11/2018
18/11/2018
24/11/2018
Date

Appendix E1

Calibration Certificates for Impact Noise Monitoring Equipment

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 801750 Page 1 of 2 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q80695 **Date of receipt :** 13-Feb-18

Item Tested

Description : Thermo-Anemometer

Manufacturer : AZ Instrument **I.D.** : ET/EN/001/05

Model : AZ 8908 **Serial No.** : 1064869

Test Conditions

Date of Test : 7-Mar-18 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : T03, Z04.

Test Results

A correction factor of x 1.1 is required to bring the meter reading to within the manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S155	Std. Anemometer	711600	NIM-PRC
S223C	Std. Thermometer	705236	NIM-PRC

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : W M Ng

Approved by : Steve Kwan

Date: 7-Mar-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

E

Calibration Certificate

Results :

1. Velocity

Applied Value (m/s)	UUT Reading (m/s)	Corrected Reading (UUT Rdg. × 1.1)	Mfr's Spec.
0.00	0.0	0.0	± (3% of reading + 0.2 m/s)
2.50	2.3	2.5	
5.00	4.7	5.2	
10.00	*9.1	10.0	
15.00	*13.7	15.1	
19.00	*17.3	19.0	

2. Temperature

Applied Value (°C)	UUT Reading (°C)	Mfr's Spec.
22.50	22.2	± 1 °C

Remark : 1. UUT : Unit-Under-Test
2. Uncertainty : ± (0.9% + 0.16 m/s) for Velocity, ± 0.1 °C for Temperature, for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 022 hPa
4. *Out of Specification

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **810241** Page 1 of 2 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q84111 **Date of receipt :** 15-Oct-18

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion **I.D.** : ET/EN/002/01

Model : NC-73 **Serial No.** : 10196943

Test Conditions

Date of Test : 23-Oct-18 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	805025	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR
S041	Universal Counter	802061	SCL-HKSAR
S206	Sound Level Meter	805027	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term dritt, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : Elva Chong

Approved by : Kin Wong

Date: 23-Oct-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.2 dB	± 1 dB

Uncertainty : ± 0.2 dB

2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	1.017 kHz	± 2 %

Uncertainty : ± 0.1 %

3. Level Stability : 0.0 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.3 %
Mfr's Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remarks: 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 018 hPa

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **802480** Page 1 of 2 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q80960 **Date of receipt :** 12-Mar-18

Item Tested

Description : Acoustic Calibrator
Manufacturer : Castle
Model : GA607
I.D. : ET/EN/002/07
Serial No. : 038641

Test Conditions

Date of Test : 20-Mar-18
Ambient Temperature : (23 ± 3)°C
Supply Voltage : --
Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.
Ref. Document/Procedure : IEC 60942, F06, F20, Z02.

Test Results

All results were within the IEC 60942 Class 1 specification.
The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	707126	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	703741	NIM-PRC & SCL-HKSAR
S041	Universal Counter	802061	SCL-HKSAR
S206	Sound Level Meter	707129	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : Elva Chong

Approved by : Kin Wong

Date: 20-Mar-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.1	± 0.4 dB

Uncertainty : ± 0.2 dB

2. Short-term Level Fluctuation : 0.0 dB

IEC 60942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.000	± 1 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

4. Total Distortion : < 2.8 %

IEC 60942 Class 1 Spec. : < 4 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 018 hPa.

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. 808095 Page 1 of 3 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q83245 **Date of receipt :** 14-Aug-18

Item Tested

Description : Precision Integrating Sound Level Meter

Manufacturer : Rion **I.D.** : ET/EN/003/12

Model : NL-31 **Serial No.** : 00773032

Test Conditions

Date of Test : 21-Aug-18 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z01, IEC 61672.

Test Results

All results were within the IEC 61672 Type 1 or manufacturer's specification

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C170120	SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : Elva Chong

Approved by : Kin Wong

Date: 21-Aug-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

E

Calibration Certificate

Results :

1. **Self-generated noise:** 16.6 dBA (Mfr's Spec ≤ 20 dBA)

2. **Acoustical signal test**

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L_A	Fast	94.0	93.9
		Slow		93.9
	L_C	Fast		93.9
	Lp	Fast		94.0
30 – 120	L_A	Fast	94.0	93.9
		Slow		93.9
	L_C	Fast		93.9
	Lp	Fast		93.9
30 – 120	L_A	Fast	114.0	113.9
		Slow		113.9
	L_C	Fast		113.9
	Lp	Fast		114.0

IEC 61672 Type 1 Spec. : ± 1.1 dB
Uncertainty : ± 0.1 dB

3 **Electrical signal tests of frequency weightings** (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	- 39.7	- 39.4 dB, ± 2 dB
63 Hz	- 26.3	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.2	- 16.1 dB, ± 1.5 dB
250 Hz	- 8.7	- 8.6 dB, ± 1 dB
500 Hz	- 3.3	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1.1 dB
2 kHz	+ 1.3	+ 1.2 dB, ± 1.6 dB
4 kHz	+ 1.1	+ 1.0 dB, ± 1.6 dB
8 kHz	- 1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	- 6.6	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : ± 0.1 dB

Calibration Certificate

4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	- -	± 0.4 dB
C	94.0	94.0	0.0	
P	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	- -	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 000 hPa.
4. Preamplifier model : NH-21 , S/N : 25043
5. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **804850** Page 1 of 3 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q81883 **Date of receipt :** 15-May-18

Item Tested

Description : Sound Level Meter

Manufacturer : Rion **I.D.** : ET/EN/003/16

Model : NL-52 **Serial No.** : 00253765

Test Conditions

Date of Test : 24-May-18 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

Test Results

All results were within the IEC 61672 Type 1 or manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C170120	SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : Elva Chong

Approved by : Kin Wong

Date: 24-May-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. **Self-generated noise:** 15.3 dBA (Mfr's Spec ≤ 17 dBA)

2. **Acoustical signal test**

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
20 ~ 130	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.0
	Z	F	OFF		94.0
	A	F	OFF	114.0	114.0
		S	OFF		114.0
	C	F	OFF		114.0
	Z	F	OFF		114.0

IEC 61672 Type 1 Spec. : ± 1.1 dB
Uncertainty : ± 0.1 dB

3 **Electrical signal tests of frequency weightings** (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, ± 2 dB
63 Hz	-26.2	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.2	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1.6 dB
4 kHz	+1.0	+ 1.0 dB, ± 1.6 dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : ± 0.1 dB

Calibration Certificate

4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	- -	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	- -	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 008 hPa.
4. Preamplifier model : NH-25 , S/N : 43795
5. Firmware Version: 1.5
6. Power Supply Check: OK
7. The UUT was adjusted with the laboratory's calibrator at the reference sound pressure level before the calibration.

---------- END ----------

Hong Kong Calibration Ltd.
香港校正有限公司

Calibration Certificate

Certificate No. **801918** Page 1 of 3 Pages

Customer : ETS-Testconsult Limited

Address : 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

Order No. : Q80767 **Date of receipt :** 27-Feb-18

Item Tested

Description : Sound Level Meter

Manufacturer : Rion **I.D.** : ET/EN/003/18

Model : NL-52 **Serial No.** : 00264520

Test Conditions

Date of Test : 7-Mar-18 **Supply Voltage** : --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

Test Results

All results were within the IEC 61672 Type 1 or manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C170120	SCL-HKSAR
S240	Sound Level Calibrator	703741	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : _____
Elva Chong

Approved by : _____
Kin Wong

Date: 7-Mar-18

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

Calibration Certificate

Results :

1. **Self-generated noise:** 14.8 dBA (Mfr's Spec ≤ 17 dBA)

2. **Acoustical signal test**

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
30-130	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.0
	Z	F	OFF		94.0
	A	F	OFF	114.0	114.1
		S	OFF		114.1
	C	F	OFF		114.1
	Z	F	OFF		114.1

IEC 61672 Type 1 Spec. : ± 1.1 dB
Uncertainty : ± 0.1 dB

3 **Electrical signal tests of frequency weightings** (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, ± 2 dB
63 Hz	-26.3	- 26.2 dB, ± 1.5 dB
125 Hz	-16.2	- 16.1 dB, ± 1.5 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1.4 dB
1 kHz	0.0 (Ref)	0 dB, ± 1.1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1.6 dB
4 kHz	+0.9	+ 1.0 dB, ± 1.6 dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.1	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : ± 0.1 dB

Calibration Certificate

4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	- -	± 0.4 dB
C	94.	94.0	0.0	
Z	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	- -	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test
2. The uncertainty claimed is for a confidence probability of not less than 95%.
3. Atmospheric Pressure : 1 022 hPa.
4. Preamplifier model : NH-25 , S/N : 64645
5. Firmware Version: 1.7
6. Power Supply Check: OK
7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

--- END ---

Appendix E2

Impact Noise Monitoring Results

Day-time Noise Monitoring

Monitoring Station: NSR1a

Date	Weather	Temperature (℃)	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at NSR1a, dB (A)			Wind Speed (m/s)
					Leq (30min)	L10 (30min)	L90 (30min)	
02/11/18	Cloudy	25	13:05	13:35	69.2	71.4	63.2	0.4
08/11/18	Cloudy	24	09:15	09:45	65.1	68.9	62.5	0.3
14/11/18	Cloudy	23	09:30	10:00	65.9	70.3	61.4	0.4
20/11/18	Cloudy	20	08:57	09:27	66.8	67.3	59.4	0.2
26/11/18	Cloudy	20	14:43	15:13	66.6	68.7	60.0	0.4

Min	65.1	67.3	59.4
Max	69.2	71.4	63.2
Logarithmic Average for normal weekdays	67.0	69.5	61.5

Monitoring Station: NSR2b

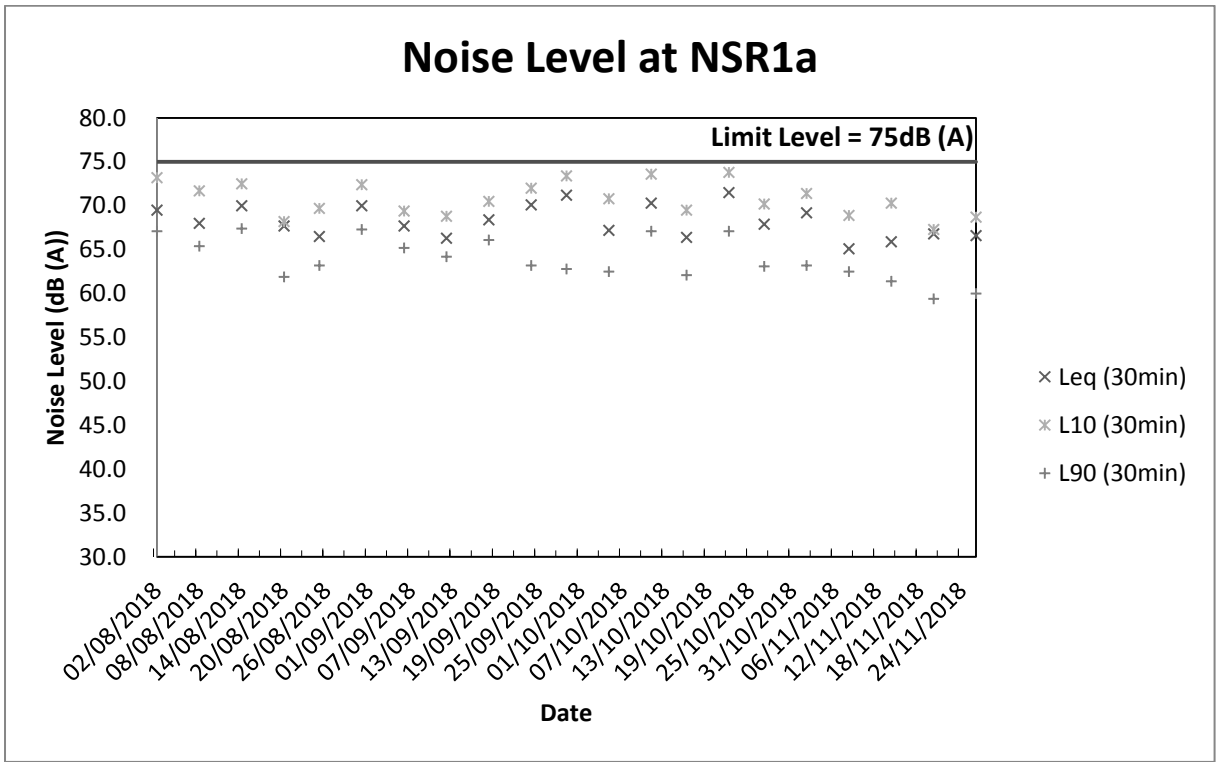
Date	Weather	Temperature (℃)	Start Time (hh:mm)	End Time (hh:mm)	Noise Level at NSR2b, dB (A)			Wind Speed (m/s)
					Leq (30min)	L10 (30min)	L90 (30min)	
02/11/18	Cloudy	25	09:05	09:35	67.7	69.5	61.8	0.3
08/11/18	Cloudy	25	14:10	14:40	64.8	67.7	61.3	0.4
14/11/18	Cloudy	24	14:25	14:55	66.8	71.3	62.5	0.4
20/11/18	Cloudy	20	08:17	08:47	64.0	65.5	59.0	0.2
26/11/18	Cloudy	20	14:03	14:33	61.9	64.2	58.3	0.2

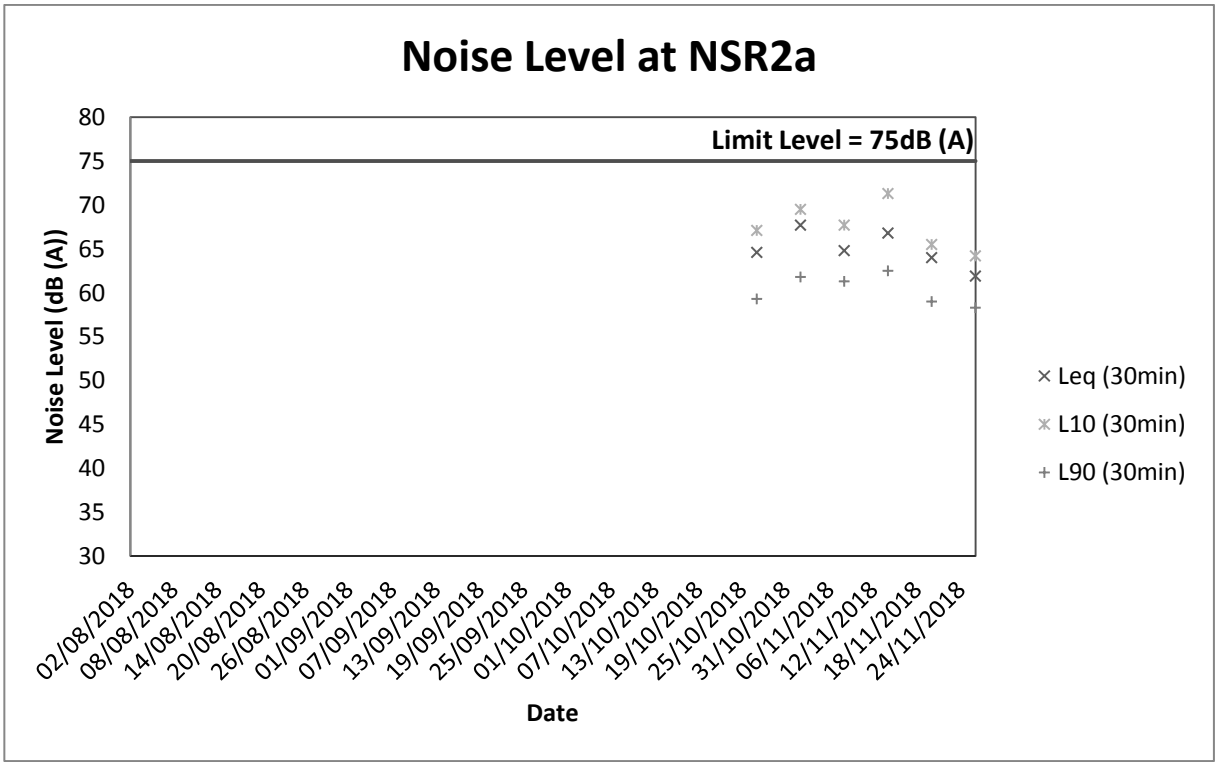
(*) : 3dB(A) correction was added to the results during the free-field noise measurements

Min	61.9	64.2	58.3
Max	67.7	71.3	62.5
Logarithmic Average for normal weekdays	65.5	68.4	60.9

Appendix E3

Graphical Plots of Impact Noise Monitoring Data


Noise Level at NSR1a
Limit Level = 75dB (A)
Noise Level (dB (A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
02/08/2018
08/08/2018
14/08/2018
20/08/2018
26/08/2018
01/09/2018
07/09/2018
13/09/2018
19/09/2018
25/09/2018
01/10/2018
07/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
06/11/2018
12/11/2018
18/11/2018
24/11/2018
Date
Leq (30min)
L10 (30min)
L90 (30min)


Noise Level at NSR2a
Limit Level = 75dB (A)
Noise Level (dB (A))
80
75
70
65
60
55
50
45
40
35
30
02/08/2018
08/08/2018
14/08/2018
20/08/2018
26/08/2018
01/09/2018
07/09/2018
13/09/2018
19/09/2018
25/09/2018
01/10/2018
07/10/2018
13/10/2018
19/10/2018
25/10/2018
31/10/2018
06/11/2018
12/11/2018
18/11/2018
24/11/2018
Date
Leq (30min)
L10 (30min)
L90 (30min)

Appendix F1

Calibration Certificates for Impact Water Quality Monitoring Equipments

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/015 Manufacturer : HACH

Model No. : 2100Q Serial No. : 14110C036534

Date of Calibration : 25/10/18 Due Date : 24/1/19

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	20.4	+2.0%
100	98.5	-1.5%
800	800	0.0%

(*) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria

Difference : -5 % to 5 %

The turbidity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Prepared by : _____ Checked by : _____

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Calibration Report of Dissolved Oxygen Meter (*In situ* Measurement)

Equipment Ref. No. :	ET/EW/008/006	Manufacturer :	YSI
Model No. :	Pro 2030	Serial No. :	12A100554
Calibration Date :	2/9/2018	Calibration Due Date :	1/12/2018

Temperature Verification by Reference Thermometer (ET/0521/028)

	Temperature Reading (°C)	Correction (°C)	Corrected Temperature (°C)	Difference (°C)
Reference Thermometer	20.3	0.0	20.3	0.2
DO Meter	20.5	0.0	20.5	

Criteria: Difference between corrected temperature from DO meter and reference thermometer : < ± 0.5 °C

Zero Point Checking

DO meter reading (mg/L)	0.03

Criteria: Zero checking: 0.0 mg/L

Linearity Checking of Dissolved Oxygen Content by APHA 19ed 4500-O G

Purging time, min	Expected DO value (mg/L) (ET/0510/012)	DO meter reading (mg/L)	Difference of DO Content (mg/L)
2	6.85	7.05	0.20
5	4.37	4.25	0.12
10	1.80	1.71	0.09

Criteria: Difference between DO meter reading and expected DO value: < ±0.30 mg/L

Salinity Checking by APHA 19ed 2520 B

	Expected Salinity (ppt)	DO meter reading (ppt)
Reagent No. of NaCl (10 ppt): CPE/012/4.7/27	10	9.2
Reagent No. of NaCl (30 ppt): CPE/012/4.8/27	30	28.3

Criteria: Difference between DO meter reading and expected Salinity: ±10.0 %

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / ~~unacceptable~~ # for use.

Delete as appropriate

Calibrated by : _____ Approved by : _____

Appendix F2

Impact Water Quality Monitoring Results

Impact Water Quality Monitoring

Monitoring Station: R1b

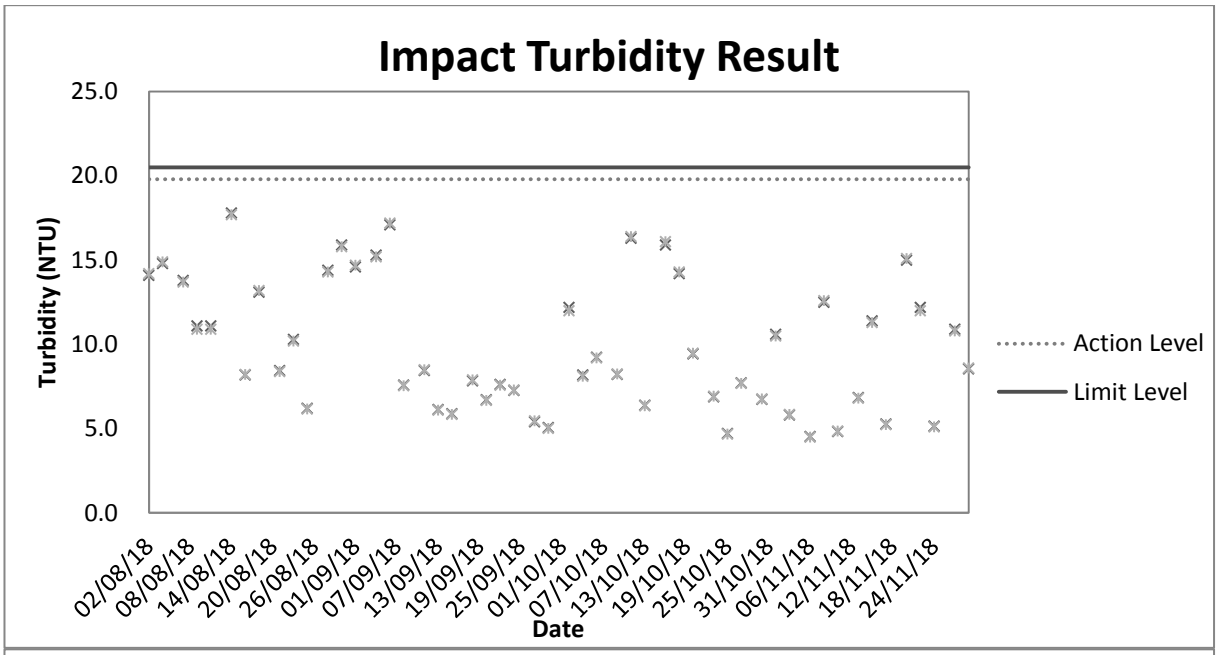
Date	Sampling Duration	Weather Condition	Sampling Level	Turbidity (NTU)			Dissolved Oxygen (DO) (mg/L)			Suspended Solid (SS) (mg/L)		
				1	2	Ave.	1	2	Ave.	1	2	Ave.
01/11/18	13:50-14:01	Cloudy	Mid-Depth	10.6	10.5	10.6	2.60	2.64	2.62	6	6	6
03/11/18	13:00-13:05	Cloudy	Mid-Depth	5.8	5.9	5.8	2.60	2.64	2.62	6	5	5
06/11/18	13:10-13:15	Fine	Mid-Depth	4.5	4.5	4.5	2.34	2.30	2.32	<5	<5	<5
08/11/18	15:57-16:07	Cloudy	Mid-Depth	12.5	12.6	12.6	2.84	2.88	2.86	<5	<5	<5
10/11/18	10:35-10:50	Cloudy	Mid-Depth	4.8	4.9	4.8	2.79	2.74	2.77	<5	<5	<5
13/11/18	13:00-13:05	Cloudy	Mid-Depth	6.9	6.8	6.8	1.96	1.93	1.95	<5	<5	<5
15/11/18	13:50-13:59	Cloudy	Mid-Depth	11.4	11.3	11.4	2.89	2.92	2.91	6	7	7
17/11/18	11:35-11:40	Cloudy	Mid-Depth	5.3	5.2	5.3	2.41	2.44	2.43	<5	<5	<5
20/11/18	14:38-14:45	Cloudy	Mid-Depth	15.0	15.1	15.1	2.31	2.34	2.33	6	7	6
22/11/18	15:15-15:20	Fine	Mid-Depth	12.2	12.0	12.1	2.34	2.32	2.33	5	<5	<5
24/11/18	14:50-14:55	Fine	Mid-Depth	5.2	5.1	5.1	2.32	2.35	2.34	6	5	6
27/11/18	15:30-15:40	Cloudy	Mid-Depth	10.9	10.8	10.9	2.18	2.13	2.16	16	15	15
29/11/18	14:05-14:15	Cloudy	Mid-Depth	8.6	8.6	8.6	3.77	3.84	3.81	9	8	9
				Min		4.5	Min		1.93	Min		<5
				Max		15.1	Max		3.84	Max		16
				Average		8.7	Average		2.57	Average		4

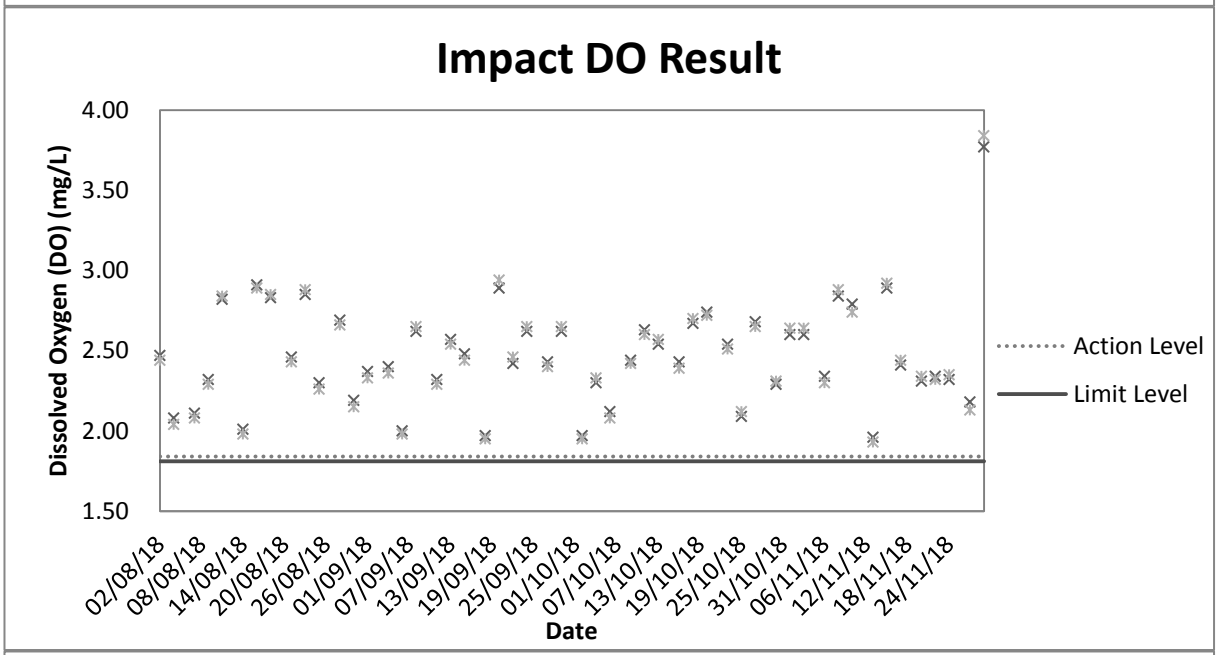
Remark(s):

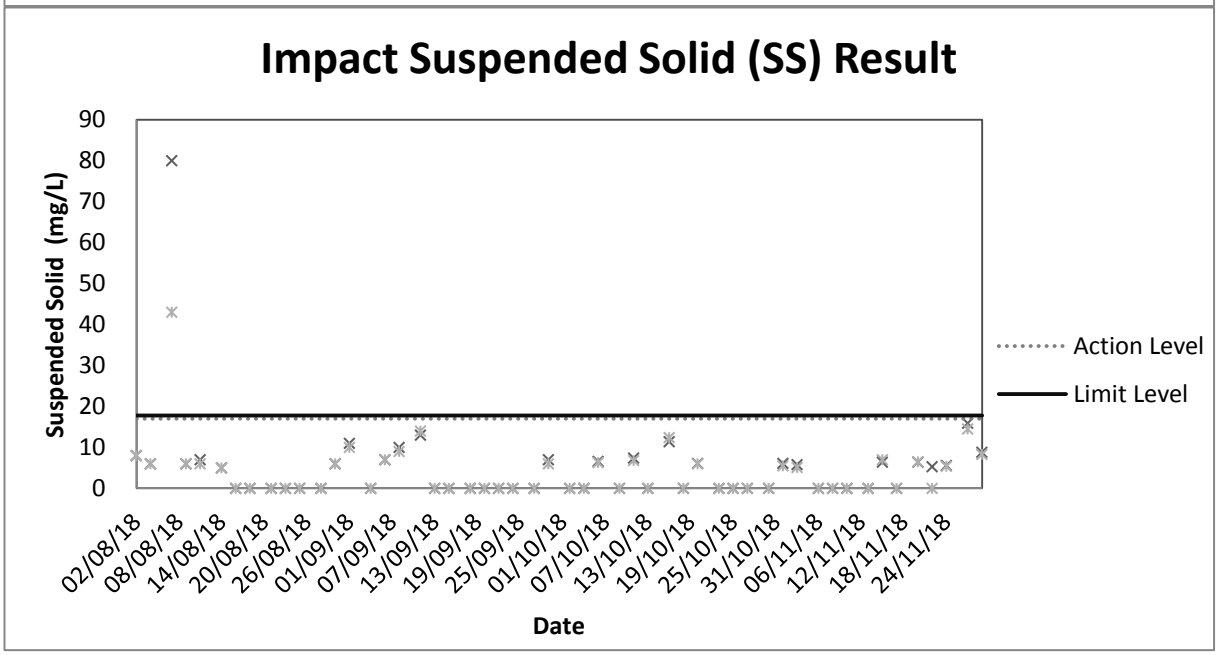
1. (#) 200ml sample was used for Suspended Solids analysis. Practical Quantitation Limit of Suspended Solids reported less than 5 mg/L. The results reported as <5 would be counted as zero for average measurement.

Appendix F3

Graphical Plots of Impact Water Quality Monitoring Data


Impact Turbidity Result
Turbidity (NTU)
25.0
20.0
15.0
10.0
5.0
0.0
02/08/18
08/08/18
14/08/18
20/08/18
26/08/18
01/09/18
07/09/18
13/09/18
19/09/18
25/09/18
01/10/18
07/10/18
13/10/18
19/10/18
25/10/18
31/10/18
06/11/18
12/11/18
18/11/18
24/11/18
Date
Action Level
Limit Level


Impact DO Result
Dissolved Oxygen (DO) (mg/L)
4.00
3.50
3.00
2.50
2.00
1.50
02/08/18
08/08/18
14/08/18
20/08/18
26/08/18
01/09/18
07/09/18
13/09/18
19/09/18
25/09/18
01/10/18
07/10/18
13/10/18
19/10/18
25/10/18
31/10/18
06/11/18
12/11/18
18/11/18
24/11/18
Date
Action Level
Limit Level


Impact Suspended Solid (SS) Result
Suspended Solid (mg/L)
90
80
70
60
50
40
30
20
10
0
02/08/18
08/08/18
14/08/18
20/08/18
26/08/18
01/09/18
07/09/18
13/09/18
19/09/18
25/09/18
01/10/18
07/10/18
13/10/18
19/10/18
25/10/18
31/10/18
06/11/18
12/11/18
18/11/18
24/11/18
Date
Action Level
Limit Level

Appendix G

Weather Condition

Daily Extract of Meteorological Observations, November 2018 – Wetland Park

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1013.2	28.0	23.8	21.1	10.1	44	0.0	020	11.0
02	1016.1	23.2	20.9	19.4	16.5	76	0.0	340	6.2
03	1017.0	22.8	21.2	18.6	18.4	85	0.0	070	3.4
04	1016.6	27.7	22.6	20.6	20.5	89	0.5	060	2.5
05	1016.7	30.2	24.5	21.2	20.4	79	0.0	070	5.1
06	1017.3	30.2	24.9	21.4	19.9	76	0.0	060	6.1
07	1017.4	30.9	25.1	21.2	20.7	78	0.0	070	4.9
08	1016.8	28.5	24.5	21.5	20.5	79	0.0	330	4.7
09	1017.0	29.6	23.6	20.1	17.7	70	0.0	060	6.8
10	1017.8	27.3	23.8	22.1	19.7	78	0.0	090	8.4
11	1016.9	28.7	23.8	20.3	19.8	80	0.0	060	5.4
12	1014.0	30.6	24.9	21.0	20.3	77	0.0	080	3.2
13	1014.1	28.2	23.7	21.0	18.8	74	0.0	080	5.2
14	1015.3	29.0	24.0	22.0	18.6	72	0.0	070	8.8
15	1016.1#	25.2#	23.0#	21.8#	19.0#	79#	0.0	090	9.0
16	1014.6#	26.4#	24.6#	23.9#	22.1#	86#	0.0	070	5.8
17	1015.6	25.3	23.8	22.9	21.9	89	0.0	070	5.5
18	1016.0	30.0	24.5	21.9	21.8	86	0.0	060	4.1
19	1017.7	27.3	23.5	20.7	18.6	75	0.0	070	6.0
20	1017.1	27.7	23.2	20.3	19.4	80	0.0	060	7.5
21	1016.4	29.0	24.5	19.8	20.6	80	0.0	070	6.1
22	1020.6	24.0	20.2	17.6	13.3	65	0.0	020	8.8
23	1020.3	25.6	20.5	16.2	13.8	67	0.0	060	5.4
24	1019.6	25.7	21.0	17.9	17.5	82	0.0	060	4.1
25	1019.0	21.3	18.4	16.5	17.2	93	32.5	080	3.0
26	1019.1	21.2#	18.3	16.4#	17.5	95	14.0	060	4.3
27	1019.2	22.7#	19.6	18.0#	17.9	90	1.0	360	2.6
28	1019.4	22.7	20.2	18.9	19.4	95	8.0	100	3.5
29	1021.0	26.6#	20.8	17.3#	17.4	83	0.0	070	4.3
30	1020.2	25.4	21.4	17.8	16.8	77	0.0	050	4.8

 # data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Appendix H

Environmental Site Inspection Checklist

Environmental Site Inspection Checklist – San Wai

Inspection Date: 2-11-18 **Inspected By:** Frankie Tai
Time: 14:00 **Weather Condition:** Fine
Participants: Patrick Leung, Teddy Yeu, Abby Shan, Jason Leung, Johnny So

1	**Permits/Licenses**	N/A	Yes	No	Remarks
1.1	Are Environmental Permit, license/ other permit displayed at major site exit and vehicle access?	☐	☑	☐	
1.2	Are Construction Noise Permits available for inspection?	☐	☑	☐	
1.3	Is wastewater discharge license available for inspection?	☐	☑	☐	
1.4	Are trip tickets for chemical waste and construction waste disposal available for inspection?	☐	☑	☐	
1.5	Are relevant license/permits for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	

2	**Air Quality**	N/A	Yes	No	Remarks
2.1	Is open burning avoided?	☐	☑	☐	
2.2	Are speed controlled at 10 km/h on unpaved site areas?	☐	☑	☐	
2.3	Are plant and equipment well maintained (i.e. without black smoke from powered plant)?	☐	☑	☐	
2.4	Observed dust source(s): ☐ Wind erosion ☐ Vehicle/ Equipment Movements ☐ Loading/ unloading of materials ☑ Others: Not observed				
2.5	Are the work sites wetted with water twice a day?	☐	☑	☐	
2.6	After removal of boulders, poles, pillars or temporary or permanent structures, are the entire surface sprayed with water or a dust suppression chemical immediately?	☐	☑	☐	
2.7	Is the area involved demolished items covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition?	☐	☑	☐	
2.8	Are wheel washing facilities with high pressure water jet provided at all site exits if practicable?	☐	☑	☐	
2.9	Are the areas of washing facilities and the road section between the washing facilities and the exit point paved with concrete, bituminous materials or hardcores?	☐	☑	☐	
2.10	Are hoarding ≧ 2.4m tall provided beside roads or area with public access?	☐	☑	☐	
2.11	Are main haul road paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical?	☐	☑	☐	
2.12	Are construction site that is within 30m of a discernible or designated vehicle entrance or exit kept clear of dusty materials?	☐	☑	☐	
2.13	Are all vehicles and plant cleaned before they leave the construction site?	☐	☑	☐	
2.14	Are loaded dump trucks covered by impervious sheeting appropriately	☐	☑	☐	

	before leaving the site?				
2.15	Are working areas of any excavation or earth moving operation sprayed with water or a dusty suppression chemical immediately?	☐	☑	☐	
2.16	Is exposed earth properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, concrete or other suitable surface stabilizer within 6 months after the last construction activity?	☑	☐	☐	
2.17	Are stockpile of dusty material covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or dust suppression chemical?	☑	☐	☐	
2.18	Are unpaved areas / designated roads watered regularly to avoid dust generation?	☐	☑	☐	
2.19	Are dusty materials covered entirely by impervious sheeting or sprayed with water?	☑	☐	☐	
2.20	Is every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) covered entirely by impervious sheeting or placed in an area sheltered on the top and 3 sides?	☑	☐	☐	
2.21	Are the approval or exempted NRMM labels painted or securely fixed on site machines or vehicles and displayed at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation?	☐	☑	☐	

3	**Noise**	N/A	Yes	No	Remarks
3.1	Are idle plant/equipments turned off or throttled down?	☐	☑	☐	
3.2	Are silenced equipments or quiet plants utilized?	☐	☑	☐	
3.3	Are the silencers or mufflers properly fitted on construction equipments and maintained regularly?	☐	☑	☐	
3.4	Is temporary hoarding installed located on the site boundaries between noisy construction activities and NSRs?	☑	☐	☐	
3.5	Are noise barriers (typically density @14kg/m^2) acoustic mat or full enclosure close to noise plants including air compressor, generators and saw etc. provided to protect NSRs?	☐	☑	☐	
3.6	Do air compressors have valid noise labels?	☑	☐	☐	
3.7	Are compressor operated with doors closed?	☑	☐	☐	
3.8	QPME used with valid noise labels?	☑	☐	☐	
3.9	Are construction activities planned so that parallel operation of several sets of equipment close to a given receiver is avoided?	☑	☐	☐	
3.10	Major noise source(s): ☐ Traffic ☑ Construction activities inside of site ☐ Construction activities outside of site ☐ Others:				

4	**Water Quality**	N/A	Yes	No	Remarks
	<u>Construction Activities</u>				
4.1	Before a rainstorm, are exposed stockpiles covered with tarpaulin or impervious sheets?	☑	☐	☐	
4.2	Are stockpiles of materials placed in the locations away from the drainage channel?	☑	☐	☐	

4.3	Are site drainage systems and treatment facilities provided to minimize the water pollution?	☐	☑	☐	
4.4	Is the treated effluent quality met the requirements specified in the discharge license?	☐	☑	☐	
4.5	Is the sewage generated from toilets collected using a temporary storage system?	☑	☐	☐	
4.6	Are sewage effluent and discharges from on-site kitchen facilities directed to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible?	☑	☐	☐	
4.7	Is a licensed waste collector employed to clean the chemical toilets and temporary storage tank on a regular basis?	☑	☐	☐	
4.8	Is the storm drainage directed to storm drains via adequately designed sand/ silt removal facilities e.g. sand traps, silt traps and sediment basins?	☐	☑	☐	
4.9	Are measures taken to prevent the washout of construction materials, soil, silt or debris into any drainage system?	☐	☑	☐	
4.10	Are manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and prevent storm run-off getting into foul sewers?	☑	☐	☐	
4.11	Is a wheel washing bay provided at every site exit?	☐	☑	☐	
4.12	Is the wheel wash overflow directed to silt removal facilities before being discharged to the storm drain?	☐	☑	☐	
4.13	Is the section of construction road between the wheel washing bay and the public road surfaced with crushed stone or coarse gravel?	☐	☑	☐	
4.14	Does the surface runoff from bunded areas pass through oil/grease traps prior to discharge to the storm water system?	☑	☐	☐	
4.15	Are sedimentation tanks or package treatment systems provided to treat the large amount of sediment-laden wastewater generated from wheel washing, site runoff and construction works?	☐	☐	☐	

5	**Waste / Chemical Management**	N/A	Yes	No	Remarks
	General Waste				
5.1	Are sufficient waste disposal points provided?	☐	☑	☐	
5.2	Is waste disposed regularly?	☐	☐	☑	Item 1
5.3	Is the general waste generated on-site stored in enclosed bins or compaction units separately from the construction and chemical wastes?	☐	☑	☐	
5.4	Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?	☐	☑	☐	
	Construction Waste				
5.5	Are the temporary stockpiles maintained regularly?	☐	☑	☐	
5.6	Are the C&D materials sorted and recycled on-site?	☐	☑	☐	
5.7	Are the public fill and C&D waste segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal?	☐	☑	☐	
5.8	Is the segregation and storage of C&D wastes undertaken in designated area?	☐	☑	☐	

5.9	Are waste storage area properly cleaned and do not cause windblown litter and dust nuisance?	☐	☑	☐	
5.10	Are surplus insert C&D materials only consist of earth, building debris and broken rock and concrete and free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the public filling supervisor?	☑	☐	☐	
	Chemical / Fuel Storage Area				
5.11	Are the fuel tanks and chemical storage areas provided with locks and sited on sealed areas?	☑	☐	☐	
5.12	Are the storage areas labeled and separated (if needed)?	☐	☑	☐	
5.13	Do the storage areas have adequate ventilation and be covered to prevent rainfall entering?	☐	☑	☐	
5.14	Are the containers used for the storage of chemical wastes suitable for the substance that are holding, resist to corrosion, maintained in a good condition, and securely closed?	☐	☑	☐	
5.15	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)	☐	☑	☐	
	Chemical Waste / Waste Oil				
5.16	Is chemical waste or waste oil stored and labeled in English and Chinese properly in designated area?	☐	☑	☐	
5.17	Are chemicals and waste oil collected and stored for recycling or proper disposal?	☐	☑	☐	
	Records				
5.18	Is a licensed waste hauler used for waste collection?	☐	☑	☐	
5.19	Are the records of quantities of wastes generated, recycled and disposed properly kept?	☐	☑	☐	
5.20	For the demolition material/ waste, is the number of loads for each day recorded as appropriate?	☐	☑	☐	

6	**Landscape and Visual Impacts**	N/A	Yes	No	Remarks
6.1	Is the work site confined within site boundaries?	☐	☑	☐	
6.2	Is damage to surrounding areas avoided?	☐	☑	☐	

7	**Environmental Complaint**	N/A	Yes	No	Remarks
7.1	Number of Environmental Complaint received from dd/mm/yyyy to dd/mm/yyyy?	☑	☐	☐	

8	**General Housekeeping**	N/A	Yes	No	Remarks
8.1	Are potential stagnant pools cleared and mosquito breeding prevented?	☐	☑	☐	
8.2	Are the defined boundaries of working areas identified to prevent loss of vegetation?	☐	☑	☐	

9	**Others**	N/A	Yes	No	Remarks
9.1	Are the portable toilets maintained in a state, which will not deter the workers from utilizing these portable toilets?	☐	☑	☐	

Follow up actions for pervious Site Audit: Follow up action to item on 25.10.18, all item was improved **Observations** Itm 1: General refuse was observed at @SDB & UV area.
Corrective Actions – Mitigation Measures Implemented or Proposed (if any): Itm 1: To clean the general refuse properly.

Signature:
ET's representative

Name: Tsy Chy Hky
Date: 2.11.18

Signature:
Contractor's representative

Name: Abby Sham
Date: 2/11/18

Signature:
ET Leader

Name: C.h. Law
Date: 3.11.2018

Signature:
SO's representative

Name: C F Leung
Date: 2/11/2018

Summary of the Weekly Environmental Site Inspection

Item	Details of observations	Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Proposed Follow up Date
--	 Follow up action to Item 1 on 25/10/2018, stagnant water and oil were cleaned inside the chemical container near UV Zone.	--	181102_001	No	--

1	  General refuse was observed at SDB & UV area.	To collect the general refuse properly	181102_002	Yes	09/11/2018

Environmental Site Inspection Checklist – San Wai

Inspection Date: 9.11.18 **Inspected By:** Frankie Tang

Time: 14:00 **Weather Condition:** Fine

Participants: Patrick Leung, Teddy Tsen, Moby Shan, Jason Leung, Johny So

1	Permits/Licenses	N/A	Yes	No	Remarks
1.1	Are Environmental Permit, license/ other permit displayed at major site exit and vehicle access?	☐	☑	☐	
1.2	Are Construction Noise Permits available for inspection?	☐	☑	☐	
1.3	Is wastewater discharge license available for inspection?	☐	☑	☐	
1.4	Are trip tickets for chemical waste and construction waste disposal available for inspection?	☐	☑	☐	
1.5	Are relevant license/permits for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	

2	Air Quality	N/A	Yes	No	Remarks
2.1	Is open burning avoided?	☐	☑	☐	
2.2	Are speed controlled at 10 km/h on unpaved site areas?	☐	☑	☐	
2.3	Are plant and equipment well maintained (i.e. without black smoke from powered plant)?	☐	☑	☐	
2.4	Observed dust source(s): ☐ Wind erosion ☐ Vehicle/ Equipment Movements ☐ Loading/ unloading of materials ☑ Others: Not observed				
2.5	Are the work sites wetted with water twice a day?	☐	☑	☐	
2.6	After removal of boulders, poles, pillars or temporary or permanent structures, are the entire surface sprayed with water or a dust suppression chemical immediately?	☐	☑	☐	
2.7	Is the area involved demolished items covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition?	☐	☑	☐	
2.8	Are wheel washing facilities with high pressure water jet provided at all site exits if practicable?	☐	☑	☐	
2.9	Are the areas of washing facilities and the road section between the washing facilities and the exit point paved with concrete, bituminous materials or hardcores?	☐	☑	☐	
2.10	Are hoarding ≧ 2.4m tall provided beside roads or area with public access?	☐	☑	☐	
2.11	Are main haul road paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical?	☐	☑	☐	
2.12	Are construction site that is within 30m of a discernible or designated vehicle entrance or exit kept clear of dusty materials?	☐	☑	☐	
2.13	Are all vehicles and plant cleaned before they leave the construction site?	☐	☑	☐	
2.14	Are loaded dump trucks covered by impervious sheeting appropriately	☐	☑	☐	

	before leaving the site?				
2.15	Are working areas of any excavation or earth moving operation sprayed with water or a dusty suppression chemical immediately?	☐	☑	☐	
2.16	Is exposed earth properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, concrete or other suitable surface stabilizer within 6 months after the last construction activity?	☑	☐	☐	
2.17	Are stockpile of dusty material covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or dust suppression chemical?	☑	☐	☐	
2.18	Are unpaved areas / designated roads watered regularly to avoid dust generation?	☐	☑	☐	
2.19	Are dusty materials covered entirely by impervious sheeting or sprayed with water?	☑	☐	☐	
2.20	Is every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) covered entirely by impervious sheeting or placed in an area sheltered on the top and 3 sides?	☑	☐	☐	
2.21	Are the approval or exempted NRMM labels painted or securely fixed on site machines or vehicles and displayed at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation?	☐	☑	☐	

3	**Noise**	N/A	Yes	No	Remarks
3.1	Are idle plant/equipments turned off or throttled down?	☐	☑	☐	
3.2	Are silenced equipments or quiet plants utilized?	☐	☑	☐	
3.3	Are the silencers or mufflers properly fitted on construction equipments and maintained regularly?	☐	☑	☐	
3.4	Is temporary hoarding installed located on the site boundaries between noisy construction activities and NSRs?	☑	☐	☐	
3.5	Are noise barriers (typically density @14kg/m^2) acoustic mat or full enclosure close to noise plants including air compressor, generators and saw etc. provided to protect NSRs?	☐	☑	☐	
3.6	Do air compressors have valid noise labels?	☑	☐	☐	
3.7	Are compressor operated with doors closed?	☑	☐	☐	
3.8	QPME used with valid noise labels?	☑	☐	☐	
3.9	Are construction activities planned so that parallel operation of several sets of equipment close to a given receiver is avoided?	☑	☐	☐	
3.10	Major noise source(s): ☐ Traffic ☑ Construction activities inside of site ☐ Construction activities outside of site ☐ Others:				

4	**Water Quality**	N/A	Yes	No	Remarks
	<u>Construction Activities</u>				
4.1	Before a rainstorm, are exposed stockpiles covered with tarpaulin or impervious sheets?	☑	☐	☐	
4.2	Are stockpiles of materials placed in the locations away from the drainage channel?	☑	☐	☐	

4.3	Are site drainage systems and treatment facilities provided to minimize the water pollution?	☐	☑	☐	
4.4	Is the treated effluent quality met the requirements specified in the discharge license?	☐	☑	☐	
4.5	Is the sewage generated from toilets collected using a temporary storage system?	☑	☐	☐	
4.6	Are sewage effluent and discharges from on-site kitchen facilities directed to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible?	☑	☐	☐	
4.7	Is a licensed waste collector employed to clean the chemical toilets and temporary storage tank on a regular basis?	☑	☐	☐	
4.8	Is the storm drainage directed to storm drains via adequately designed sand/ silt removal facilities e.g. sand traps, silt traps and sediment basins?	☐	☑	☐	
4.9	Are measures taken to prevent the washout of construction materials, soil, silt or debris into any drainage system?	☐	☑	☐	
4.10	Are manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and prevent storm run-off getting into foul sewers?	☑	☐	☐	
4.11	Is a wheel washing bay provided at every site exit?	☐	☑	☐	
4.12	Is the wheel wash overflow directed to silt removal facilities before being discharged to the storm drain?	☐	☑	☐	
4.13	Is the section of construction road between the wheel washing bay and the public road surfaced with crushed stone or coarse gravel?	☐	☑	☐	
4.14	Does the surface runoff from bunded areas pass through oil/grease traps prior to discharge to the storm water system?	☑	☐	☐	
4.15	Are sedimentation tanks or package treatment systems provided to treat the large amount of sediment-laden wastewater generated from wheel washing, site runoff and construction works?	☐	☑	☐	

5	**Waste / Chemical Management**	N/A	Yes	No	Remarks
	General Waste				
5.1	Are sufficient waste disposal points provided?	☐	☑	☐	
5.2	Is waste disposed regularly?	☐	☑	☐	
5.3	Is the general waste generated on-site stored in enclosed bins or compaction units separately from the construction and chemical wastes?	☐	☑	☐	
5.4	Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?	☐	☑	☐	
	Construction Waste				
5.5	Are the temporary stockpiles maintained regularly?	☐	☑	☐	
5.6	Are the C&D materials sorted and recycled on-site?	☐	☑	☐	
5.7	Are the public fill and C&D waste segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal?	☐	☑	☐	
5.8	Is the segregation and storage of C&D wastes undertaken in designated area?	☐	☑	☐	

5.9	Are waste storage area properly cleaned and do not cause windblown litter and dust nuisance?	☐	☑	☐	
5.10	Are surplus insert C&D materials only consist of earth, building debris and broken rock and concrete and free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the public filling supervisor?	☑	☐	☐	
	Chemical / Fuel Storage Area				
5.11	Are the fuel tanks and chemical storage areas provided with locks and sited on sealed areas?	☑	☐	☐	
5.12	Are the storage areas labeled and separated (if needed)?	☐	☑	☐	
5.13	Do the storage areas have adequate ventilation and be covered to prevent rainfall entering?	☐	☑	☐	
5.14	Are the containers used for the storage of chemical wastes suitable for the substance that are holding, resist to corrosion, maintained in a good condition, and securely closed?	☐	☑	☐	
5.15	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)	☐	☑	☐	
	Chemical Waste / Waste Oil				
5.16	Is chemical waste or waste oil stored and labeled in English and Chinese properly in designated area?	☐	☑	☐	
5.17	Are chemicals and waste oil collected and stored for recycling or proper disposal?	☐	☑	☐	
	Records				
5.18	Is a licensed waste hauler used for waste collection?	☐	☑	☐	
5.19	Are the records of quantities of wastes generated, recycled and disposed properly kept?	☐	☑	☐	
5.20	For the demolition material/ waste, is the number of loads for each day recorded as appropriate?	☐	☑	☐	

6	**Landscape and Visual Impacts**	N/A	Yes	No	Remarks
6.1	Is the work site confined within site boundaries?	☐	☑	☐	
6.2	Is damage to surrounding areas avoided?	☐	☑	☐	

7	**Environmental Complaint**	N/A	Yes	No	Remarks
7.1	Number of Environmental Complaint received from dd/mm/yyyy to dd/mm/yyyy?	☑	☐	☐	

8	**General Housekeeping**	N/A	Yes	No	Remarks
8.1	Are potential stagnant pools cleared and mosquito breeding prevented?	☐	☑	☐	
8.2	Are the defined boundaries of working areas identified to prevent loss of vegetation?	☐	☑	☐	

9	**Others**	N/A	Yes	No	Remarks
9.1	Are the portable toilets maintained in a state, which will not deter the workers from utilizing these portable toilets?	☐	☑	☐	

Follow up actions for pervious Site Audit: Follow up actn to item on 2.11.18, all items were improved **Observations** No observat was recorded on this site inspection.
Corrective Actions – Mitigation Measures Implemented or Proposed (if any): N/A

Signature:
ET's representative

Name: Tsz Chi Ho

Date: 9.11.18

Signature:
Contractor's representative

Name: Abby Sham

Date: 9/11/18

Signature:
ET Leader

Name: C. L. Lau

Date: 10.11.2018

Signature:
SO's representative

Name: CY Choi

Date: 9/11/2018

Summary of the Weekly Environmental Site Inspection

Item	Details of observations	Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Proposed Follow up Date
--	  Follow up action to Item 1 on 02/11/2018, general refuse was collected at SDB & UV area.	--	181102_001	No	--

Environmental Site Inspection Checklist – San Wai

Inspection Date: 16 November 2018 **Inspected By:** Ivy Lo

Time: 14:30 **Weather Condition:** Fine

Participants: Patrick Leung, Kevin Tang, Abby Sham, Jason Leung

1	**Permits/Licenses**	N/A	Yes	No	Remarks
1.1	Are Environmental Permit, license/ other permit displayed at major site exit and vehicle access?	☐	☑	☐	
1.2	Are Construction Noise Permits available for inspection?	☐	☑	☐	
1.3	Is wastewater discharge license available for inspection?	☐	☑	☐	
1.4	Are trip tickets for chemical waste and construction waste disposal available for inspection?	☐	☑	☐	
1.5	Are relevant license/permits for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	

2	**Air Quality**	N/A	Yes	No	Remarks
2.1	Is open burning avoided?	☐	☑	☐	
2.2	Are speed controlled at 10 km/h on unpaved site areas?	☐	☑	☐	
2.3	Are plant and equipment well maintained (i.e. without black smoke from powered plant)?	☐	☑	☐	
2.4	Observed dust source(s): ☐ Wind erosion ☐ Vehicle/ Equipment Movements ☐ Loading/ unloading of materials ☑ Others: Not observed				
2.5	Are the work sites wetted with water twice a day?	☐	☑	☐	
2.6	After removal of boulders, poles, pillars or temporary or permanent structures, are the entire surface sprayed with water or a dust suppression chemical immediately?	☐	☑	☐	
2.7	Is the area involved demolished items covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition?	☐	☑	☐	
2.8	Are wheel washing facilities with high pressure water jet provided at all site exits if practicable?	☐	☑	☐	
2.9	Are the areas of washing facilities and the road section between the washing facilities and the exit point paved with concrete, bituminous materials or hardcores?	☐	☑	☐	
2.10	Are hoarding ≧ 2.4m tall provided beside roads or area with public access?	☐	☑	☐	
2.11	Are main haul road paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical?	☐	☑	☐	
2.12	Are construction site that is within 30m of a discernible or designated vehicle entrance or exit kept clear of dusty materials?	☐	☑	☐	
2.13	Are all vehicles and plant cleaned before they leave the construction site?	☐	☑	☐	
2.14	Are loaded dump trucks covered by impervious sheeting appropriately	☐	☑	☐	

	before leaving the site?				
2.15	Are working areas of any excavation or earth moving operation sprayed with water or a dusty suppression chemical immediately?	☐	☑	☐	
2.16	Is exposed earth properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, concrete or other suitable surface stabilizer within 6 months after the last construction activity?	☑	☐	☐	
2.17	Are stockpile of dusty material covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or dust suppression chemical?	☑	☐	☐	
2.18	Are unpaved areas / designated roads watered regularly to avoid dust generation?	☐	☑	☐	
2.19	Are dusty materials covered entirely by impervious sheeting or sprayed with water?	☑	☐	☐	
2.20	Is every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) covered entirely by impervious sheeting or placed in an area sheltered on the top and 3 sides?	☑	☐	☐	
2.21	Are the approval or exempted NRMM labels painted or securely fixed on site machines or vehicles and displayed at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation?	☐	☑	☐	

3	**Noise**	**N/A**	**Yes**	**No**	**Remarks**
3.1	Are idle plant/equipments turned off or throttled down?	☐	☑	☐	
3.2	Are silenced equipments or quiet plants utilized?	☐	☑	☐	
3.3	Are the silencers or mufflers properly fitted on construction equipments and maintained regularly?	☐	☑	☐	
3.4	Is temporary hoarding installed located on the site boundaries between noisy construction activities and NSRs?	☑	☐	☐	
3.5	Are noise barriers (typically density @14kg/m^2) acoustic mat or full enclosure close to noise plants including air compressor, generators and saw etc. provided to protect NSRs?	☐	☑	☐	
3.6	Do air compressors have valid noise labels?	☑	☐	☐	
3.7	Are compressor operated with doors closed?	☑	☐	☐	
3.8	QPME used with valid noise labels?	☑	☐	☐	
3.9	Are construction activities planned so that parallel operation of several sets of equipment close to a given receiver is avoided?	☑	☐	☐	
3.10	Major noise source(s): ☐ Traffic ☑ Construction activities inside of site ☐ Construction activities outside of site ☐ Others:				

4	**Water Quality**	**N/A**	**Yes**	**No**	**Remarks**
	<u>Construction Activities</u>				
4.1	Before a rainstorm, are exposed stockpiles covered with tarpaulin or impervious sheets?	☑	☐	☐	
4.2	Are stockpiles of materials placed in the locations away from the drainage channel?	☑	☐	☐	

4.3	Are site drainage systems and treatment facilities provided to minimize the water pollution?	☐	☑	☐	
4.4	Is the treated effluent quality met the requirements specified in the discharge license?	☐	☑	☐	
4.5	Is the sewage generated from toilets collected using a temporary storage system?	☑	☐	☐	
4.6	Are sewage effluent and discharges from on-site kitchen facilities directed to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible?	☑	☐	☐	
4.7	Is a licensed waste collector employed to clean the chemical toilets and temporary storage tank on a regular basis?	☑	☐	☐	
4.8	Is the storm drainage directed to storm drains via adequately designed sand/ silt removal facilities e.g. sand traps, silt traps and sediment basins?	☐	☑	☐	
4.9	Are measures taken to prevent the washout of construction materials, soil, silt or debris into any drainage system?	☐	☑	☐	
4.10	Are manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and prevent storm run-off getting into foul sewers?	☑	☐	☐	
4.11	Is a wheel washing bay provided at every site exit?	☐	☑	☐	
4.12	Is the wheel wash overflow directed to silt removal facilities before being discharged to the storm drain?	☐	☑	☐	
4.13	Is the section of construction road between the wheel washing bay and the public road surfaced with crushed stone or coarse gravel?	☐	☑	☐	
4.14	Does the surface runoff from bunded areas pass through oil/grease traps prior to discharge to the storm water system?	☑	☐	☐	
4.15	Are sedimentation tanks or package treatment systems provided to treat the large amount of sediment-laden wastewater generated from wheel washing, site runoff and construction works?	☐	☑	☐	

5	**Waste / Chemical Management**	**N/A**	**Yes**	**No**	**Remarks**
	General Waste				
5.1	Are sufficient waste disposal points provided?	☐	☑	☐	
5.2	Is waste disposed regularly?	☐	☑	☐	
5.3	Is the general waste generated on-site stored in enclosed bins or compaction units separately from the construction and chemical wastes?	☐	☑	☐	
5.4	Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?	☐	☑	☐	
	Construction Waste				
5.5	Are the temporary stockpiles maintained regularly?	☐	☑	☐	
5.6	Are the C&D materials sorted and recycled on-site?	☐	☑	☐	
5.7	Are the public fill and C&D waste segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal?	☐	☑	☐	
5.8	Is the segregation and storage of C&D wastes undertaken in designated area?	☐	☑	☐	

5.9	Are waste storage area properly cleaned and do not cause windblown litter and dust nuisance?	☐	☑	☐	
5.10	Are surplus insert C&D materials only consist of earth, building debris and broken rock and concrete and free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the public filling supervisor?	☑	☐	☐	
	Chemical / Fuel Storage Area				
5.11	Are the fuel tanks and chemical storage areas provided with locks and sited on sealed areas?	☑	☐	☐	
5.12	Are the storage areas labeled and separated (if needed)?	☐	☑	☐	
5.13	Do the storage areas have adequate ventilation and be covered to prevent rainfall entering?	☐	☑	☐	
5.14	Are the containers used for the storage of chemical wastes suitable for the substance that are holding, resist to corrosion, maintained in a good condition, and securely closed?	☐	☑	☐	
5.15	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)	☐	☐	☑	Item 1
	Chemical Waste / Waste Oil				
5.16	Is chemical waste or waste oil stored and labeled in English and Chinese properly in designated area?	☐	☑	☐	
5.17	Are chemicals and waste oil collected and stored for recycling or proper disposal?	☐	☑	☐	
	Records				
5.18	Is a licensed waste hauler used for waste collection?	☐	☑	☐	
5.19	Are the records of quantities of wastes generated, recycled and disposed properly kept?	☐	☑	☐	
5.20	For the demolition material/ waste, is the number of loads for each day recorded as appropriate?	☐	☑	☐	

6	**Landscape and Visual Impacts**	**N/A**	**Yes**	**No**	**Remarks**
6.1	Is the work site confined within site boundaries?	☐	☑	☐	
6.2	Is damage to surrounding areas avoided?	☐	☑	☐	

7	**Environmental Complaint**	**N/A**	**Yes**	**No**	**Remarks**
7.1	Number of Environmental Complaint received from dd/mm/yyyy to dd/mm/yyyy?	☑	☐	☐	

8	**General Housekeeping**	**N/A**	**Yes**	**No**	**Remarks**
8.1	Are potential stagnant pools cleared and mosquito breeding prevented?	☐	☑	☐	
8.2	Are the defined boundaries of working areas identified to prevent loss of vegetation?	☐	☑	☐	

9	**Others**	**N/A**	**Yes**	**No**	**Remarks**
9.1	Are the portable toilets maintained in a state, which will not deter the workers from utilizing these portable toilets?	☐	☑	☐	

Follow up actions for pervious Site Audit: NA

Observations 1. Damaged drip tray with oil stain for a generator was observed at ~~P8~~ P1

Corrective Actions – Mitigation Measures Implemented or Proposed (if any):

1. The contractor should clean the oil stain properly and provide a proper drip tray for the generator.

Signature:
ET's representative

Name: Ivy Lo
Date: 16/11/2018

Signature:
Contractor's representative

Name: Abby Sham
Date: 16/11/2018

Signature:
ET Leader

Name: C. L. Lau
Date: 17/11/2018

Signature:
SO's representative

Name: C F CHAN
Date: 16/11/2018

Summary of the Weekly Environmental Site Inspection

Item	Details of observations	Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Proposed Follow up Date
1	 Damaged drip tray with oil stain for a generator was observed at P1.	To clean the oil stain properly and provide a proper drip tray	181116_001	Yes	23/11/2018

Environmental Site Inspection Checklist – San Wai

Inspection Date: 22 November 2018 **Inspected By:** Ivy Lo

Time: 14:30 **Weather Condition:** Fine

Participants: Kevin Tang, Johnny So, Abby Sham, Jason Leung

1	**Permits/Licenses**	N/A	Yes	No	Remarks
1.1	Are Environmental Permit, license/ other permit displayed at major site exit and vehicle access?	☐	☑	☐	
1.2	Are Construction Noise Permits available for inspection?	☐	☑	☐	
1.3	Is wastewater discharge license available for inspection?	☐	☑	☐	
1.4	Are trip tickets for chemical waste and construction waste disposal available for inspection?	☐	☑	☐	
1.5	Are relevant license/permits for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	

2	**Air Quality**	N/A	Yes	No	Remarks
2.1	Is open burning avoided?	☐	☑	☐	
2.2	Are speed controlled at 10 km/h on unpaved site areas?	☐	☑	☐	
2.3	Are plant and equipment well maintained (i.e. without black smoke from powered plant)?	☐	☑	☐	
2.4	Observed dust source(s): ☐ Wind erosion ☐ Vehicle/ Equipment Movements ☐ Loading/ unloading of materials ☑ Others: Not observed				
2.5	Are the work sites wetted with water twice a day?	☐	☑	☐	
2.6	After removal of boulders, poles, pillars or temporary or permanent structures, are the entire surface sprayed with water or a dust suppression chemical immediately?	☐	☑	☐	
2.7	Is the area involved demolished items covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition?	☐	☑	☐	
2.8	Are wheel washing facilities with high pressure water jet provided at all site exits if practicable?	☐	☑	☐	
2.9	Are the areas of washing facilities and the road section between the washing facilities and the exit point paved with concrete, bituminous materials or hardcores?	☐	☑	☐	
2.10	Are hoarding ≧ 2.4m tall provided beside roads or area with public access?	☐	☑	☐	
2.11	Are main haul road paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical?	☐	☑	☐	
2.12	Are construction site that is within 30m of a discernible or designated vehicle entrance or exit kept clear of dusty materials?	☐	☑	☐	
2.13	Are all vehicles and plant cleaned before they leave the construction site?	☐	☑	☐	
2.14	Are loaded dump trucks covered by impervious sheeting appropriately	☐	☑	☐	

	before leaving the site?				
2.15	Are working areas of any excavation or earth moving operation sprayed with water or a dusty suppression chemical immediately?	☐	☑	☐	
2.16	Is exposed earth properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, concrete or other suitable surface stabilizer within 6 months after the last construction activity?	☑	☐	☐	
2.17	Are stockpile of dusty material covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or dust suppression chemical?	☑	☐	☐	
2.18	Are unpaved areas / designated roads watered regularly to avoid dust generation?	☐	☑	☐	
2.19	Are dusty materials covered entirely by impervious sheeting or sprayed with water?	☑	☐	☐	
2.20	Is every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) covered entirely by impervious sheeting or placed in an area sheltered on the top and 3 sides?	☑	☐	☐	
2.21	Are the approval or exempted NRMM labels painted or securely fixed on site machines or vehicles and displayed at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation?	☐	☑	☐	

3	**Noise**	**N/A**	**Yes**	**No**	**Remarks**
3.1	Are idle plant/equipments turned off or throttled down?	☐	☑	☐	
3.2	Are silenced equipments or quiet plants utilized?	☐	☑	☐	
3.3	Are the silencers or mufflers properly fitted on construction equipments and maintained regularly?	☐	☑	☐	
3.4	Is temporary hoarding installed located on the site boundaries between noisy construction activities and NSRs?	☑	☐	☐	
3.5	Are noise barriers (typically density @14kg/m^2) acoustic mat or full enclosure close to noise plants including air compressor, generators and saw etc. provided to protect NSRs?	☐	☑	☐	
3.6	Do air compressors have valid noise labels?	☑	☐	☐	
3.7	Are compressor operated with doors closed?	☑	☐	☐	
3.8	QPME used with valid noise labels?	☑	☐	☐	
3.9	Are construction activities planned so that parallel operation of several sets of equipment close to a given receiver is avoided?	☑	☐	☐	
3.10	Major noise source(s): ☐ Traffic ☑ Construction activities inside of site ☐ Construction activities outside of site ☐ Others:				

4	**Water Quality**	**N/A**	**Yes**	**No**	**Remarks**
	<u>Construction Activities</u>				
4.1	Before a rainstorm, are exposed stockpiles covered with tarpaulin or impervious sheets?	☑	☐	☐	
4.2	Are stockpiles of materials placed in the locations away from the drainage channel?	☑	☐	☐	

4.3	Are site drainage systems and treatment facilities provided to minimize the water pollution?	☐	☑	☐	
4.4	Is the treated effluent quality met the requirements specified in the discharge license?	☐	☑	☐	
4.5	Is the sewage generated from toilets collected using a temporary storage system?	☑	☐	☐	
4.6	Are sewage effluent and discharges from on-site kitchen facilities directed to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible?	☑	☐	☐	
4.7	Is a licensed waste collector employed to clean the chemical toilets and temporary storage tank on a regular basis?	☑	☐	☐	
4.8	Is the storm drainage directed to storm drains via adequately designed sand/ silt removal facilities e.g. sand traps, silt traps and sediment basins?	☑	☐	☐	
4.9	Are measures taken to prevent the washout of construction materials, soil, silt or debris into any drainage system?	☑	☐	☐	
4.10	Are manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and prevent storm run-off getting into foul sewers?	☑	☐	☐	
4.11	Is a wheel washing bay provided at every site exit?	☑	☐	☐	
4.12	Is the wheel wash overflow directed to silt removal facilities before being discharged to the storm drain?	☑	☐	☐	
4.13	Is the section of construction road between the wheel washing bay and the public road surfaced with crushed stone or coarse gravel?	☐	☑	☐	
4.14	Does the surface runoff from bunded areas pass through oil/grease traps prior to discharge to the storm water system?	☑	☐	☐	
4.15	Are sedimentation tanks or package treatment systems provided to treat the large amount of sediment-laden wastewater generated from wheel washing, site runoff and construction works?	☐	☑	☐	

5	**Waste / Chemical Management**	**N/A**	**Yes**	**No**	**Remarks**
	General Waste				
5.1	Are sufficient waste disposal points provided?	☐	☑	☐	
5.2	Is waste disposed regularly?	☐	☑	☐	
5.3	Is the general waste generated on-site stored in enclosed bins or compaction units separately from the construction and chemical wastes?	☐	☑	☐	
5.4	Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?	☐	☑	☐	
	Construction Waste				
5.5	Are the temporary stockpiles maintained regularly?	☐	☑	☐	
5.6	Are the C&D materials sorted and recycled on-site?	☐	☑	☐	
5.7	Are the public fill and C&D waste segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal?	☐	☑	☐	
5.8	Is the segregation and storage of C&D wastes undertaken in designated area?	☐	☑	☐	

5.9	Are waste storage area properly cleaned and do not cause windblown litter and dust nuisance?	☐	☑	☐	
5.10	Are surplus insert C&D materials only consist of earth, building debris and broken rock and concrete and free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the public filling supervisor?	☑	☐	☐	
	Chemical / Fuel Storage Area				
5.11	Are the fuel tanks and chemical storage areas provided with locks and sited on sealed areas?	☑	☐	☐	
5.12	Are the storage areas labeled and separated (if needed)?	☐	☑	☐	
5.13	Do the storage areas have adequate ventilation and be covered to prevent rainfall entering?	☐	☑	☐	
5.14	Are the containers used for the storage of chemical wastes suitable for the substance that are holding, resist to corrosion, maintained in a good condition, and securely closed?	☐	☑	☐	
5.15	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)	☐	☑	☐	
	Chemical Waste / Waste Oil				
5.16	Is chemical waste or waste oil stored and labeled in English and Chinese properly in designated area?	☐	☑	☐	
5.17	Are chemicals and waste oil collected and stored for recycling or proper disposal?	☐	☑	☐	
	Records				
5.18	Is a licensed waste hauler used for waste collection?	☐	☑	☐	
5.19	Are the records of quantities of wastes generated, recycled and disposed properly kept?	☐	☑	☐	
5.20	For the demolition material/ waste, is the number of loads for each day recorded as appropriate?	☐	☑	☐	

6	**Landscape and Visual Impacts**	**N/A**	**Yes**	**No**	**Remarks**
6.1	Is the work site confined within site boundaries?	☐	☑	☐	
6.2	Is damage to surrounding areas avoided?	☐	☑	☐	

7	**Environmental Complaint**	**N/A**	**Yes**	**No**	**Remarks**
7.1	Number of Environmental Complaint received from dd/mm/yyyy to dd/mm/yyyy?	☑	☐	☐	

8	**General Housekeeping**	**N/A**	**Yes**	**No**	**Remarks**
8.1	Are potential stagnant pools cleared and mosquito breeding prevented?	☐	☑	☐	
8.2	Are the defined boundaries of working areas identified to prevent loss of vegetation?	☐	☑	☐	

9	**Others**	**N/A**	**Yes**	**No**	**Remarks**
9.1	Are the portable toilets maintained in a state, which will not deter the workers from utilizing these portable toilets?	☐	☑	☐	

Follow up actions for pervious Site Audit:	Follow up action to item on 16/11/2018, all item was improved.
Observations	N/A
Corrective Actions – Mitigation Measures Implemented or Proposed (if any):	Reminder : The contractor was remind to provide proper measures to prevent the surface runoff entering the public drainage system.

Signature:
ET's representative

Name: Ivy Lo
Date: 22/11/2018

Signature:
Contractor's representative

Name: Abby Sham
Date: 22/11/2018

Signature:
ET Leader

Name: C. L. Lau
Date: 22/11/2018

Signature:
SO's representative

Name: C. K. Leung
Date: 22/11/2018

Summary of the Weekly Environmental Site Inspection

Item	Details of observations	Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Proposed Follow up Date
--	 Follow up action to Item 1 on 16/11/2018, oil stain was cleared and stopper was provided for the drip tray.	--	181122_001	No	--

Environmental Site Inspection Checklist – San Wai

Inspection Date: 30-11-18 **Inspected By:** Frankie Tang

Time: 14:00 **Weather Condition:** Fine

Participants: Patrick Lam, Teddy Tsui, Ally Shum, Joshua Leung, Jhy So

1	Permits/Licenses	N/A	Yes	No	Remarks
1.1	Are Environmental Permit, license/ other permit displayed at major site exit and vehicle access?	☐	☑	☐	
1.2	Are Construction Noise Permits available for inspection?	☐	☑	☐	
1.3	Is wastewater discharge license available for inspection?	☐	☑	☐	
1.4	Are trip tickets for chemical waste and construction waste disposal available for inspection?	☐	☑	☐	
1.5	Are relevant license/permits for disposal of construction waste or excavated materials available for inspection?	☐	☑	☐	

2	Air Quality	N/A	Yes	No	Remarks
2.1	Is open burning avoided?	☐	☑	☐	
2.2	Are speed controlled at 10 km/h on unpaved site areas?	☐	☑	☐	
2.3	Are plant and equipment well maintained (i.e. without black smoke from powered plant)?	☐	☑	☐	
2.4	Observed dust source(s): ☐ Wind erosion ☐ Vehicle/ Equipment Movements ☐ Loading/ unloading of materials ☑ Others: not observed				
2.5	Are the work sites wetted with water twice a day?	☐	☑	☐	
2.6	After removal of boulders, poles, pillars or temporary or permanent structures, are the entire surface sprayed with water or a dust suppression chemical immediately?	☐	☑	☐	
2.7	Is the area involved demolished items covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition?	☐	☑	☐	
2.8	Are wheel washing facilities with high pressure water jet provided at all site exits if practicable?	☐	☑	☐	
2.9	Are the areas of washing facilities and the road section between the washing facilities and the exit point paved with concrete, bituminous materials or hardcores?	☐	☑	☐	
2.10	Are hoarding ≧ 2.4m tall provided beside roads or area with public access?	☐	☑	☐	
2.11	Are main haul road paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical?	☐	☐	☑	Item 1
2.12	Are construction site that is within 30m of a discernible or designated vehicle entrance or exit kept clear of dusty materials?	☐	☑	☐	
2.13	Are all vehicles and plant cleaned before they leave the construction site?	☐	☑	☐	
2.14	Are loaded dump trucks covered by impervious sheeting appropriately	☐	☑	☐	

	before leaving the site?				
2.15	Are working areas of any excavation or earth moving operation sprayed with water or a dusty suppression chemical immediately?	☐	☑	☐	
2.16	Is exposed earth properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, concrete or other suitable surface stabilizer within 6 months after the last construction activity?	☑	☐	☐	
2.17	Are stockpile of dusty material covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or dust suppression chemical?	☑	☐	☐	
2.18	Are unpaved areas / designated roads watered regularly to avoid dust generation?	☐	☑	☐	
2.19	Are dusty materials covered entirely by impervious sheeting or sprayed with water?	☑	☐	☐	
2.20	Is every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) covered entirely by impervious sheeting or placed in an area sheltered on the top and 3 sides?	☑	☐	☐	
2.21	Are the approval or exempted NRMM labels painted or securely fixed on site machines or vehicles and displayed at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation?	☐	☑	☐	

3	**Noise**	N/A	Yes	No	Remarks
3.1	Are idle plant/equipments turned off or throttled down?	☐	☑	☐	
3.2	Are silenced equipments or quiet plants utilized?	☐	☑	☐	
3.3	Are the silencers or mufflers properly fitted on construction equipments and maintained regularly?	☐	☑	☐	
3.4	Is temporary hoarding installed located on the site boundaries between noisy construction activities and NSRs?	☑	☐	☐	
3.5	Are noise barriers (typically density @14kg/m^2) acoustic mat or full enclosure close to noise plants including air compressor, generators and saw etc. provided to protect NSRs?	☐	☑	☐	
3.6	Do air compressors have valid noise labels?	☑	☐	☐	
3.7	Are compressor operated with doors closed?	☑	☐	☐	
3.8	QPME used with valid noise labels?	☑	☐	☐	
3.9	Are construction activities planned so that parallel operation of several sets of equipment close to a given receiver is avoided?	☑	☐	☐	
3.10	Major noise source(s): ☐ Traffic ☑ Construction activities inside of site ☐ Construction activities outside of site ☐ Others:				

4	**Water Quality**	N/A	Yes	No	Remarks
	Construction Activities				
4.1	Before a rainstorm, are exposed stockpiles covered with tarpaulin or impervious sheets?	☑	☐	☐	
4.2	Are stockpiles of materials placed in the locations away from the drainage channel?	☑	☐	☐	

4.3	Are site drainage systems and treatment facilities provided to minimize the water pollution?	☐	☑	☐	
4.4	Is the treated effluent quality met the requirements specified in the discharge license?	☐	☑	☐	
4.5	Is the sewage generated from toilets collected using a temporary storage system?	☑	☐	☐	
4.6	Are sewage effluent and discharges from on-site kitchen facilities directed to public foul sewers or collected in a temporary storage tank if connection to public foul sewers is not feasible?	☑	☐	☐	
4.7	Is a licensed waste collector employed to clean the chemical toilets and temporary storage tank on a regular basis?	☑	☐	☐	
4.8	Is the storm drainage directed to storm drains via adequately designed sand/ silt removal facilities e.g. sand traps, silt traps and sediment basins?	☐	☑	☐	
4.9	Are measures taken to prevent the washout of construction materials, soil, silt or debris into any drainage system?	☐	☑	☐	
4.10	Are manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and prevent storm run-off getting into foul sewers?	☑	☐	☐	
4.11	Is a wheel washing bay provided at every site exit?	☐	☑	☐	
4.12	Is the wheel wash overflow directed to silt removal facilities before being discharged to the storm drain?	☐	☑	☐	
4.13	Is the section of construction road between the wheel washing bay and the public road surfaced with crushed stone or coarse gravel?	☐	☑	☐	
4.14	Does the surface runoff from bunded areas pass through oil/grease traps prior to discharge to the storm water system?	☑	☐	☐	
4.15	Are sedimentation tanks or package treatment systems provided to treat the large amount of sediment-laden wastewater generated from wheel washing, site runoff and construction works?	☑	☐	☐	

5	**Waste / Chemical Management**	N/A	Yes	No	Remarks
	General Waste				
5.1	Are sufficient waste disposal points provided?	☐	☑	☐	
5.2	Is waste disposed regularly?	☐	☑	☐	
5.3	Is the general waste generated on-site stored in enclosed bins or compaction units separately from the construction and chemical wastes?	☐	☑	☐	
5.4	Are separated labeled containers/ areas provided for facilitating recycling and waste segregation?	☐	☑	☐	
	Construction Waste				
5.5	Are the temporary stockpiles maintained regularly?	☐	☑	☐	
5.6	Are the C&D materials sorted and recycled on-site?	☐	☑	☐	
5.7	Are the public fill and C&D waste segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal?	☐	☑	☐	
5.8	Is the segregation and storage of C&D wastes undertaken in designated area?	☐	☑	☐	

5.9	Are waste storage area properly cleaned and do not cause windblown litter and dust nuisance?	☐	☑	☐	
5.10	Are surplus insert C&D materials only consist of earth, building debris and broken rock and concrete and free from marine mud, household refuse, plastic, metals, industrial and chemical waste, animal and vegetable matter, and other material considered unsuitable by the public filling supervisor?	☑	☐	☐	
	Chemical / Fuel Storage Area				
5.11	Are the fuel tanks and chemical storage areas provided with locks and sited on sealed areas?	☑	☐	☐	
5.12	Are the storage areas labeled and separated (if needed)?	☐	☑	☐	
5.13	Do the storage areas have adequate ventilation and be covered to prevent rainfall entering?	☐	☑	☐	
5.14	Are the containers used for the storage of chemical wastes suitable for the substance that are holding, resist to corrosion, maintained in a good condition, and securely closed?	☐	☑	☐	
5.15	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)	☐	☑	☐	
	Chemical Waste / Waste Oil				
5.16	Is chemical waste or waste oil stored and labeled in English and Chinese properly in designated area?	☐	☑	☐	
5.17	Are chemicals and waste oil collected and stored for recycling or proper disposal?	☐	☑	☐	
	Records				
5.18	Is a licensed waste hauler used for waste collection?	☐	☑	☐	
5.19	Are the records of quantities of wastes generated, recycled and disposed properly kept?	☐	☑	☐	
5.20	For the demolition material/ waste, is the number of loads for each day recorded as appropriate?	☐	☑	☐	

6	**Landscape and Visual Impacts**	**N/A**	**Yes**	**No**	**Remarks**
6.1	Is the work site confined within site boundaries?	☐	☑	☐	
6.2	Is damage to surrounding areas avoided?	☐	☑	☐	

7	**Environmental Complaint**	**N/A**	**Yes**	**No**	**Remarks**
7.1	Number of Environmental Complaint received from dd/mm/yyyy to dd/mm/yyyy?	☑	☐	☐	

8	**General Housekeeping**	**N/A**	**Yes**	**No**	**Remarks**
8.1	Are potential stagnant pools cleared and mosquito breeding prevented?	☐	☐	☑	if any
8.2	Are the defined boundaries of working areas identified to prevent loss of vegetation?	☐	☑	☐	

9	**Others**	**N/A**	**Yes**	**No**	**Remarks**
9.1	Are the portable toilets maintained in a state, which will not deter the workers from utilizing these portable toilets?	☐	☑	☐	

Follow up actions for pervious Site Audit: N/A

Observations Itm 1: Dust emission was observed on site
Itm 2: Stangant water was observed on drip tray near P1 area.

Corrective Actions – Mitigation Measures Implemented or Proposed (if any):
Itm 1: Increase the water spraying properly
Itm 2: To clean the stangant water properly.

Signature:
ET's representative

Name: Frankie Tung
Date: 30-11-18

Signature:
Contractor's representative

Name: Abby Sham
Date: 30/11/18

Signature:
ET Leader

Name: C. L. Lau
Date: 01.12.2018

Signature:
SO's representative

Name: C F CHAN
Date: 30/11/2018

Summary of the Weekly Environmental Site Inspection

Item	Details of observations	Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Proposed Follow up Date
1	 Dust emission was observed on the site.	To provide water spraying properly	181130_001	Yes	07/12/2018

2	 Stagnant water was observed inside the drip tray near P1 area.	To provide water spraying properly	181130_002	Yes	07/12/2018

Appendix I

Landscape and Visual Impact Assessment Checklist

Landscape and Visual Impact Assessment Checklist for Site Audit

Inspection Date: 2 November 2018 **Weather:** ~~Sunny/ Fine/~~ Cloudy~~/ Rainy~~
Time: 14:00 p.m. **Wind:** ~~Strong/ Breeze/ Light/~~ Calm

Item	Description	YES	NO	N/A	Actions/ Remarks
1	**Construction Phase**				
1.1	Is the detailed tree survey completed prior to construction work?	✓			
1.2	Are trees to be transplanted removed to their final positions?		✓		
1.3	Are the transplants and existing trees to be retained properly protected from damage by stout hoarding positioned as directed by a qualified Landscape Architect?	✓			Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.4	Is regular inspection of the retained and transplanted trees made to ensure the effectiveness of the hoarding?	✓			
1.5	Are the TPZ clearly demarcated on site and surrounded by strong fences sturdy enough to withstand impacts from the construction activities?	✓			Except trees far beyond the extent of construction activities, strong protective fence is noted. Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.6	Are warning signs and notices installed at the fences denoting the "tree protection zone" to prohibit the entry of equipment or construction activities?	✓			
1.7	Are tree labels with clear indication of tree no. and status (e.g. "R", "T" or "F") provided for all the trees on site?	✓			
1.8	If protective fencings are not practicable, are the tree root systems adequately protected from soil compaction due to passage of vehicles, equipment or machinery?	✓			

1.9	Are vehicular/foot paths and storage areas designated away from TPZ?	✓			
1.10	Are the trees properly irrigated and sprayed with water to remove the accumulated construction dust during dry season in order to lessen the chances of decline and to maintain the vigour of trees?			✓	
1.11	Are the trees free from any sign of distress, such as dieback, leaf loss, or general decline in tree health or appearance or tree damage with symptoms of construction injury?			✓	Trees in eastern boundary: 1) Dead branches to remove 2) Tear bark/ stubs to be properly primed.
1.12	Are the trees free from wire or nail and prohibited to be used as anchor for any site activities?	✓			
1.13	Are cutting, trenching, excavating or raising of soil level within the TPZ prohibited?	✓			
1.14	Is improper pruning of the tree branches/roots prohibited?	✓			
1.15	Are the trees free from any tree root damage?	✓			
1.16	Are construction works or operation of machines within the TPZ prohibited?	✓			
1.17	Is the TPZ free from pollution from effluent water, machine petroleum or chemical spillage?	✓			
1.18	Is the excavated topsoil stored and protected on site for reuse for restoration of screen planting works?			✓	The site has previously been reclaimed from ponds. Most of the excavated topsoil is not desirable for reuse due to its inferior quality. Contractor's submitted referencing documents are attached in the checklist dated 4 May, 2018 for information.
1.19	Is the progress of the above activities reported in the monthly EM&A report?	✓			
2	**Operational Phase (12 months period from commissioning of the expanded and upgraded works)**				

2.1	Is a planting reserve, where locates around the site perimeter of approximately 5m wide, provided to allow a continuous belt of trees to be planted as a visual screen?			✓	
2.2	Is the planting reserve complemented the boundary planting to the existing San Wai STW?			✓	
2.3	Is all new planting maintained for 12 months to ensure proper establishment?			✓	
2.4	Are the trees free from sign of deterioration of tree health and/or structure?			✓	
2.5	Are the trees free from insect pests and disease pathogens?			✓	
2.6	Are the irrigation systems functioning properly and well maintained?			✓	
2.7	Are the tree root systems adequately protected from soil compaction due to storage of materials or operation of machinery?			✓	

Summary/ Remarks:

Follow up actions taken by Contractor for previous comments:

1. Trees at eastern boundary – pruning of dead branches has carried out. Contractor is reminded to carry out proper reduction cut to some of the branches in future to meet the current tree care standard.

The contractor was reminded to rectify the following:

1. Generally, contractor was reminded to keep on the tree protection and maintenance.

New Observation:

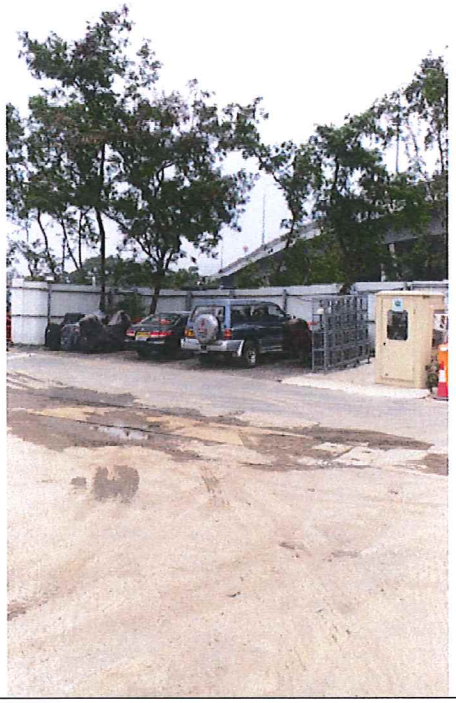
1. Grade change and construction activities are noted on site. Contractor was reminded not to disturb the TPZ.

Reminders:

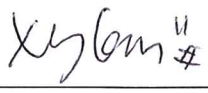
1. Contractor was reminded to provide TPZ with robust fence, whenever possible, at the drip line of all retained trees unless the trees are well beyond the extend of construction activities.

Photo Record:

Figure 1	Figure 2
	
General condition of the tress at northern side of the site	Removal of weeds and trees at south-west corner of the site is noted

Figure 3	Figure 4
	
Tree protection to be make good	Condition of trees at the entrance of the existing treatment plant
Figure 5	Figure 6
	
General condition of the existing trees at eastern boundary	Proper protective fence (outside works extent) is noted

Signature:

		Signature	Date
Inspected & Recorded by	Registered Landscape Architect	 Xylem Leung	

Landscape and Visual Impact Assessment Checklist for Site Audit

Inspection Date: 16 November 2018 **Weather:** ~~Sunny/ Fine/~~ Cloudy~~/ Rainy~~
Time: 14:00 p.m. **Wind:** ~~Strong/ Breeze/ Light/~~ Calm

Item	Description	YES	NO	N/A	Actions/ Remarks
1	**Construction Phase**				
1.1	Is the detailed tree survey completed prior to construction work?	✓			
1.2	Are trees to be transplanted removed to their final positions?		✓		
1.3	Are the transplants and existing trees to be retained properly protected from damage by stout hoarding positioned as directed by a qualified Landscape Architect?	✓			Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.4	Is regular inspection of the retained and transplanted trees made to ensure the effectiveness of the hoarding?	✓			
1.5	Are the TPZ clearly demarcated on site and surrounded by strong fences sturdy enough to withstand impacts from the construction activities?	✓			Except trees far beyond the extent of construction activities, strong protective fence is noted. Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.6	Are warning signs and notices installed at the fences denoting the "tree protection zone" to prohibit the entry of equipment or construction activities?	✓			
1.7	Are tree labels with clear indication of tree no. and status (e.g. "R", "T" or "F") provided for all the trees on site?	✓			
1.8	If protective fencings are not practicable, are the tree root systems adequately protected from soil compaction due to passage of vehicles, equipment or machinery?	✓			
1.9	Are vehicular/foot paths and storage areas designated away from TPZ?	✓			

1.10	Are the trees properly irrigated and sprayed with water to remove the accumulated construction dust during dry season in order to lessen the chances of decline and to maintain the vigour of trees?			✓	
1.11	Are the trees free from any sign of distress, such as dieback, leaf loss, or general decline in tree health or appearance or tree damage with symptoms of construction injury?			✓	Trees in eastern boundary: 1) Dead branches to remove 2) Tear bark/ stubs to be properly primed.
1.12	Are the trees free from wire or nail and prohibited to be used as anchor for any site activities?	✓			
1.13	Are cutting, trenching, excavating or raising of soil level within the TPZ prohibited?	✓			
1.14	Is improper pruning of the tree branches/roots prohibited?	✓			
1.15	Are the trees free from any tree root damage?	✓			
1.16	Are construction works or operation of machines within the TPZ prohibited?	✓			
1.17	Is the TPZ free from pollution from effluent water, machine petroleum or chemical spillage?	✓			
1.18	Is the excavated topsoil stored and protected on site for reuse for restoration of screen planting works?			✓	The site has previously been reclaimed from ponds. Most of the excavated topsoil is not desirable for reuse due to its inferior quality. Contractor's submitted referencing documents are attached in the checklist dated 4 May, 2018 for information.
1.19	Is the progress of the above activities reported in the monthly EM&A report?	✓			
2	**Operational Phase (12 months period from commissioning of the expanded and upgraded works)**				
2.1	Is a planting reserve, where locates around the site perimeter of approximately 5m wide, provided to allow a continuous belt of trees to be planted as a visual screen?			✓	

2.2	Is the planting reserve complemented the boundary planting to the existing San Wai STW?			✓	
2.3	Is all new planting maintained for 12 months to ensure proper establishment?			✓	
2.4	Are the trees free from sign of deterioration of tree health and/or structure?			✓	
2.5	Are the trees free from insect pests and disease pathogens?			✓	
2.6	Are the irrigation systems functioning properly and well maintained?			✓	
2.7	Are the tree root systems adequately protected from soil compaction due to storage of materials or operation of machinery?			✓	

Summary/ Remarks:

Follow up actions taken by Contractor for previous comments:

1. Trees at eastern boundary – pruning of dead branches has carried out. Contractor is reminded to carry out proper reduction cut to some of the branches in future to meet the current tree care standard.

The contractor was reminded to rectify the following:

1. Generally, contractor was reminded to keep on the tree protection and maintenance.

New Observation:

1. Grade change and construction activities are noted on site. Contractor was reminded not to disturb the TPZ.

Reminders:

1. Contractor was reminded to provide TPZ with robust fence, whenever possible, at the drip line of all retained trees unless the trees are well beyond the extend of construction activities.

Photo Record:

Figure 1	Figure 2
	
General condition of the tress at northern side of the site	Removal of weeds and trees at south-west corner of the site is noted

Figure 3	Figure 4
	
Tree protection to be make good	Condition of trees at the entrance of the existing treatment plant
Figure 5	Figure 6
	
General condition of the existing trees at eastern boundary	Proper protective fence (outside works extent) is noted

Signature:

		Signature	Date
Inspected & Recorded by	Registered Landscape Architect	Xylem Leung	

Landscape and Visual Impact Assessment Checklist for Site Audit

Inspection Date: 30 November 2018 **Weather:** ~~Sunny/ Fine/~~ **Cloudy**~~/ Rainy~~
Time: 14:00 p.m. **Wind:** ~~Strong/ Breeze/ Light/~~ **Calm**

Item	Description	YES	NO	N/A	Actions/ Remarks
1	**Construction Phase**				
1.1	Is the detailed tree survey completed prior to construction work?	✓			
1.2	Are trees to be transplanted removed to their final positions?		✓		
1.3	Are the transplants and existing trees to be retained properly protected from damage by stout hoarding positioned as directed by a qualified Landscape Architect?	✓			Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.4	Is regular inspection of the retained and transplanted trees made to ensure the effectiveness of the hoarding?	✓			
1.5	Are the TPZ clearly demarcated on site and surrounded by strong fences sturdy enough to withstand impacts from the construction activities?	✓			Except trees far beyond the extent of construction activities, strong protective fence is noted. Eastern side trees: Protective fence has been provided at lot. Northern side trees: They are protected outside lot.
1.6	Are warning signs and notices installed at the fences denoting the "tree protection zone" to prohibit the entry of equipment or construction activities?	✓			
1.7	Are tree labels with clear indication of tree no. and status (e.g. "R", "T" or "F") provided for all the trees on site?	✓			
1.8	If protective fencings are not practicable, are the tree root systems adequately protected from soil compaction due to passage of vehicles, equipment or machinery?	✓			
1.9	Are vehicular/foot paths and storage areas designated away from TPZ?	✓			

1.10	Are the trees properly irrigated and sprayed with water to remove the accumulated construction dust during dry season in order to lessen the chances of decline and to maintain the vigour of trees?			✓	
1.11	Are the trees free from any sign of distress, such as dieback, leaf loss, or general decline in tree health or appearance or tree damage with symptoms of construction injury?			✓	Trees in eastern boundary: 1) Dead branches to remove 2) Tear bark/ stubs to be properly primed.
1.12	Are the trees free from wire or nail and prohibited to be used as anchor for any site activities?	✓			
1.13	Are cutting, trenching, excavating or raising of soil level within the TPZ prohibited?	✓			
1.14	Is improper pruning of the tree branches/roots prohibited?	✓			
1.15	Are the trees free from any tree root damage?	✓			
1.16	Are construction works or operation of machines within the TPZ prohibited?	✓			
1.17	Is the TPZ free from pollution from effluent water, machine petroleum or chemical spillage?	✓			
1.18	Is the excavated topsoil stored and protected on site for reuse for restoration of screen planting works?			✓	The site has previously been reclaimed from ponds. Most of the excavated topsoil is not desirable for reuse due to its inferior quality. Contractor's submitted referencing documents are attached in the checklist dated 4 May, 2018 for information.
1.19	Is the progress of the above activities reported in the monthly EM&A report?	✓			
2	**Operational Phase (12 months period from commissioning of the expanded and upgraded works)**				
2.1	Is a planting reserve, where locates around the site perimeter of approximately 5m wide, provided to allow a continuous belt of trees to be planted as a visual screen?			✓	

2.2	Is the planting reserve complemented the boundary planting to the existing San Wai STW?			✓	
2.3	Is all new planting maintained for 12 months to ensure proper establishment?			✓	
2.4	Are the trees free from sign of deterioration of tree health and/or structure?			✓	
2.5	Are the trees free from insect pests and disease pathogens?			✓	
2.6	Are the irrigation systems functioning properly and well maintained?			✓	
2.7	Are the tree root systems adequately protected from soil compaction due to storage of materials or operation of machinery?			✓	

Summary/ Remarks:

Follow up actions taken by Contractor for previous comments:

1. Trees at eastern boundary – pruning of dead branches has carried out. Contractor is reminded to carry out proper reduction cut to some of the branches in future to meet the current tree care standard.

The contractor was reminded to rectify the following:

1. Generally, contractor was reminded to keep on the tree protection and maintenance.

New Observation:

1. Grade change and construction activities are noted on site. Contractor was reminded not to disturb the TPZ.

Reminders:

1. Contractor was reminded to provide TPZ with robust fence, whenever possible, at the drip line of all retained trees unless the trees are well beyond the extend of construction activities.

Photo Record:

Figure 1	Figure 2
	
General condition of the tress at northern side of the site	General condition of the trees at south-west corner of the site

Figure 3	Figure 4
	
Proper protective fence is noted	Condition of trees at the entrance of the existing treatment plant
Figure 5	Figure 6
	
General condition of the existing trees at eastern boundary	Proper protective fence (outside works extent) is noted

Signature:

		Signature	Date
Inspected & Recorded by	Registered Landscape Architect	Xylem Leung	

Appendix J

Waste Flow Table

Name of Department: DSD

Year: 2018

Project: Design, Build and Operate San Wai Sewage Treatment Works - Phase 1

Contract No.: DC/2013/10

Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Broken Concrete (see Note [3])	Reused in the Contract (see Note)	Reused in other Projects	Disposed as Public Fill (see Note [4])	Imported Fill (see Note [4])	Metals	Paper/ cardboard packaging	Plastics (see Note [2])	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 kg)
Jan	8.809	0.000	0.000	0.000	8.809	0.000	0.000	0.000	0.000	0.000	18.480
Feb	3.231	0.000	0.000	0.000	3.231	0.000	0.000	0.200	0.000	0.000	2.700
Mar	2.246	0.000	0.000	0.000	2.246	0.752	0.000	0.000	0.000	0.000	9.210
Apr	2.035	0.000	0.000	0.000	2.035	2.068	0.005	0.150	0.000	0.000	16.970
May	0.343	0.000	0.000	0.000	0.343	0.567	0.000	0.000	0.000	0.000	34.590
Jun	0.794	0.000	0.000	0.000	0.794	0.074	0.000	0.000	0.000	0.000	53.050
Jul	1.929	0.000	0.000	0.000	1.929	0.000	0.000	0.300	0.000	0.000	68.095
Aug	1.588	0.000	0.000	0.000	1.588	0.082	0.000	0.000	0.000	0.000	33.520
Sep	2.846	0.000	0.000	0.000	2.846	0.181	0.000	0.000	0.000	0.000	44.030
Oct	4.600	0.000	0.000	0.000	4.600	0.592	0.000	0.000	0.000	0.000	56.600
Nov	1.682	0.000	0.000	0.000	1.682	1.648	0.002	0.250	0.000	0.000	42.940
Dec											
Total	30.103	0.000	0.000	0.000	30.103	5.964	0.007	0.900	0.000	0.000	380.185

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

(4) Assumption: The densities of subbase, Type A, Type B, Rockfill, Soil, Mix Rock and Soil, Reclaimed Asphalt Pave, Slurry are 2.0 ton/m^3; the densities of Building debris and special fill materials are 2.1 ton/m^3; the densities of Broken Concrete is 2.4 ton/m^3.

Appendix K

Environmental Licenses and Permits

Item No.	Nature of Permit / License / Notification	Permit / License/ Notification No.	Date of Issue / Effective of Permit / License	Date of Expiry of Permit / License	Remark (Validity for reporting period only)
1	Environmental Permit	EP-464/2013	18/10/2013	NA	Valid
2	Billing Account for Disposal of Construction Waste	7025330	07/07/2016	NA	Valid
3	Form NA notification (for APCO)	405489	26/07/2016	25/09/2020	Valid
4	Chemical Waste Producer Registration (for Site)	5218-511-A2823-01	23/01/2017	NA	Valid
5	Wastewater Discharge Licence (for WPCO)	WT00026754-2017	28/04/2017	31/01/2022	Valid
6	Construction Noise Permit (for Site)	GW-RN0271-18	13/06/2018	12/12/2018	Valid

Appendix L

Implementation Schedule for Environmental Mitigation Measures (EMIS)

Environmental Mitigation Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Air Quality					
• The working area for the uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;	Site Area	√			
• All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition;	Site Area	√			
• Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point;	Site Entrance	√			
• 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 hardcores;	Site Exit	√			
• Where a site boundary adjoins a road, street, service and or other area accessible to the public, hoarding of not less than 2.4m from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit;	Site Area	√			
• Every main haul road (i.e. any course inside a construction site having a vehicle passing rate of higher than 4 in any 30 minutes) should be paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;	Main Haul Road		√		
• The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials;	Site Entrance and Exit	√			
• Immediately before leaving a construction site, every vehicle should be washed to remove any dusty materials from its body and wheels;	Site Exit	√			
• Where a vehicle leaving a construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;	--	√			
• The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;	Site Area	√			
• Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable	Site Area	√			

surface stabilizer within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;					
• Any stockpile of dusty material should be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.	Site Area	√			
Noise					
• Quiet plants should be used in order to reduce the noise impacts to protect the nearby NSRs.	Site Area	√			
• Temporary and Movable Noise Barriers should be used in order to reduce the noise impact to the surrounding sensitive receivers	Site Area	√			
• Intermittent noisy activities should be scheduled to minimize exposure of nearby NSRs to high levels of construction noise.	Site Area	√			
• Idle equipment should be turned off or throttled down.	Site Area	√			
• Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided	Site Area	√			
• Construction plant should be properly maintained and operated.	Site Area	√			
Water Quality					
• Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;	Site Area	√			
• The exposed soil surfaces should also be properly protected to minimize dust emission;	Site Area	√			
• The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;	Site Area	√			
• Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;	Site Exit	√			
• Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;	Site Area	√			
• A discharge license needs to be applied from EPD for discharging effluent from the construction site;	--	√			
• The treated effluent quality is required to meet the requirements specified in the discharge license;	--	√			
• Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;	Chemical Toilet	√			

• A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;	--	√			
• Illegal disposal of chemicals should be strictly prohibited;	Site Area	√			
• Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;	Site Area	√			
• 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 should be used as a guideline for handing chemical wastes;	Site Area	√			
• The impact from accidental spillage of chemicals can be effectively controlled through good management practices.	Site Area	√			
Waste Management					
• 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;	Site Area	√			
• To encourage collection of aluminium cans by individual collectors, separate bins should be provided to segregate this waste from other general refuse generated by the workforce;	Site Area	√			
• Any unused chemicals or those with remaining functional capacity should be recycled;	Site Area	√			
• Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste as fill material to minimize the quantity of waste to be disposed of to landfill;	Site Area	√			
• Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and	Site Area		√		
• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	Site Area	√			
Landscape and Visual					
• Detailed tree survey should have been completed	Site Area	√			
• Trees should be transplanted to their final positions clear of the construction site	--			√	
• Erect site hoarding to protect adjacent vegetation from damage	Site Area	√			

• Regular inspections of the transplanted trees should be made to ensure the effectiveness of the hoarding	Site Area	√			
• Any topsoil excavated during the course of the works should be stored and protected on site for reuse for the restoration and screen planting works	Site Area			√	

Appendix M

Environmental Site Inspection Schedule

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Contract No. DC/2013/10 -
Design, Build and Operate San Wai Sewage Treatment Works – Stage 1

Schedule for Environmental Monitoring and Site Inspection

November 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 **WQM**	2 **24hr-TSP** **1hr-TSP x 3** **NM** **SI**	3 **WQM**
4	5	6 **WQM**	7	8 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**	9 **SI**	10 **WQM**
11	12	13 **Effluent Sampling** **WQM**	14 **24hr-TSP** **1hr-TSP x 3** **NM**	15 **WQM**	16 **SI**	17 **WQM**
18	19	20 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**	21	22 **SI** **WQM**	23	24 **WQM**
25	26 **24hr-TSP** **1hr-TSP x 3** **NM**	27 **Effluent Sampling** **WQM**	28	29 **WQM**	30 **SI**	

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Contract No. DC/2013/10 -
Design, Build and Operate San Wai Sewage Treatment Works – Stage 1

Schedule for Environmental Monitoring and Site Inspection

December 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**
2	3	4 **WQM**	5	6 **WQM**	7 **24hr-TSP** **1hr-TSP x 3** **NM** **SI**	8 **WQM**
9	10	11 **Effluent Sampling** **WQM**	12	13 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**	14 **SI**	15 **WQM**
16	17	18 **WQM**	19 **24hr-TSP** **1hr-TSP x 3** **NM**	20 **Effluent Sampling** **WQM**	21 **SI**	22 **WQM**
23	24 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**	25	26	27 **WQM**	28 **SI**	29 **24hr-TSP** **1hr-TSP x 3** **NM** **WQM**
30	31 **WQM**					

Appendix N

Laboratory Report for Discharge Water

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

HKLAS 022
TEST CAL

TEST REPORT

Testing of Water and Wastewater

Report No. : ENA88439
Date of Issue : 20 November 2018

Information Provided by Customer

Customer Name	:	ATAL-Degremont-China Harbour Joint Venture
Customer Address	:	19/F, China Harbour Building, 370-374 King's Road, North Point, Hong Kong
Sample Source	:	Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works - Stage 1
Sample Type	:	Wastewater
Date of Sampling	:	13 November 2018
Sample Description	:	Sample was stored in 1L plastic bottle (for pH and Total Suspended Solids). Sample was stored in 500ml plastic bottle (for Chemical Oxygen Demand). Sample for Chemical Oxygen Demand was preserved by adding conc. H_2SO_4 to pH <2. Sample was collected by the customer and refrigerated after received.

Laboratory Information

Date of Received	:	13 November 2018
Date of Testing Period	:	13 to 14 November 2018
Lab Ref. No.	:	W42661

Result

Sample ID	Sample No.	Test	Method Used	Result	Unit
P1A	01	pH	In house method TPE/003/W	7.9	(at 25°C)
		Total Suspended Solids	In house method TPE/006/W	<5*	mg/L
	04	Chemical Oxygen Demand	In house method TPE/002/W	<10	mgO_2/L

Remark(s):
1. The results relate only to the tested sample as received.
2. *200ml sample was used for Total Suspended Solids analysis. PQL of Total Suspended Solids reported less than 5 mg/L.

Approved Signatory :
LAU, Chi Leung

TPE/001/W

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

HOKLAS 022
TEST CAL

TEST REPORT

Testing of Water and Wastewater

Report No. : ENA88440
Date of Issue : 20 November 2018
Page No. : 1 of 1

Information Provided by Customer

Customer Name	:	ATAL-Degremont-China Harbour Joint Venture
Customer Address	:	19/F, China Harbour Building, 370-374 King's Road, North Point, Hong Kong
Sample Source	:	Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works - Stage 1
Sample Type	:	Wastewater
Date of Sampling	:	13 November 2018
Sample Description	:	Sample was stored in 1L plastic bottle (for pH and Total Suspended Solids). Sample was stored in 500ml plastic bottle (for Chemical Oxygen Demand). Sample for Chemical Oxygen Demand was preserved by adding conc. H_2SO_4 to pH <2. Sample was collected by the customer and refrigerated after received.

Laboratory Information

Date of Received	:	13 November 2018
Date of Testing Period	:	13 to 14 November 2018
Lab Ref. No.	:	W42661

Result

Sample ID	Sample No.	Test	Method Used	Result	Unit
P1B	02	pH	In house method TPE/003/W	7.9	(at 25°C)
		Total Suspended Solids	In house method TPE/006/W	<5*	mg/L
	05	Chemical Oxygen Demand	In house method TPE/002/W	<10	mgO_2/L

Remark(s):
1. The results relate only to the tested sample as received.
2. *200ml sample was used for Total Suspended Solids analysis. PQL of Total Suspended Solids reported less than 5 mg/L.

Approved Signatory :
LAU, Chi Leung

TPE/001/W

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

HOKLAS 022
TEST CAL

TEST REPORT

Testing of Water and Wastewater

Report No. : ENA88441
Date of Issue : 20 November 2018

Information Provided by Customer

Customer Name	:	ATAL-Degremont-China Harbour Joint Venture
Customer Address	:	19/F, China Harbour Building, 370-374 King's Road, North Point, Hong Kong
Sample Source	:	Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works - Stage 1
Sample Type	:	Wastewater
Date of Sampling	:	13 November 2018
Sample Description	:	Sample was stored in 1L plastic bottle (for pH and Total Suspended Solids). Sample was stored in 500ml plastic bottle (for Chemical Oxygen Demand). Sample for Chemical Oxygen Demand was preserved by adding conc. H_2SO_4 to pH <2. Sample was collected by the customer and refrigerated after received.

Laboratory Information

Date of Received	:	13 November 2018
Date of Testing Period	:	13 to 14 November 2018
Lab Ref. No.	:	W42661

Result

Sample ID	Sample No.	Test	Method Used	Result	Unit
P8	03	pH	In house method TPE/003/W	8.0	(at 25°C)
		Total Suspended Solids	In house method TPE/006/W	<5*	mg/L
	06	Chemical Oxygen Demand	In house method TPE/002/W	<10	mgO_2/L

Remark(s):
1. The results relate only to the tested sample as received.
2. *200ml sample was used for Total Suspended Solids analysis. PQL of Total Suspended Solids reported less than 5 mg/L.

Approved Signatory :
LAU, Chi Leung

TPE/001/W

- END OF REPORT -

東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

8/F Block B,
Veristrong Industrial Centre,
34-36 Au Pui Wan Street,
Fo Tan, Hong Kong

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

HOKLAS 022
TEST CAL

TEST REPORT

Testing of Water and Wastewater

Report No. : ENA88954
Date of Issue : 10 December 2018

Information Provided by Customer

Customer Name	:	ATAL-Degremont-China Harbour Joint Venture
Customer Address	:	19/F, China Harbour Building, 370-374 King's Road, North Point, Hong Kong
Sample Source	:	Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works - Stage 1
Sample Type	:	Wastewater
Date of Sampling	:	27 November 2018
Sample Description	:	Sample was stored in 1L plastic bottle (for pH and Total Suspended Solids). Sample was stored in 500ml plastic bottle (for Chemical Oxygen Demand). Sample for Chemical Oxygen Demand was preserved by adding conc. H_2SO_4 to pH <2. Sample was collected by the customer and refrigerated after received.

Laboratory Information

Date of Received	:	27 November 2018
Date of Testing Period	:	27 to 28 Novemberf 2018
Lab Ref. No.	:	W42760

Result

Sample ID	Sample No.	Test	Method Used	Result	Unit
P1b	01	pH	In house method TPE/003/W	8.1	(at 25°C)
		Total Suspended Solids	In house method TPE/006/W	<5*	mg/L
	02	Chemical Oxygen Demand	In house method TPE/002/W	<10	mgO_2/L

Remark(s):
1. The results relate only to the tested sample as received.
2. *200ml sample was used for Total Suspended Solids analysis. PQL of Total Suspended Solids reported less than 5 mg/L.

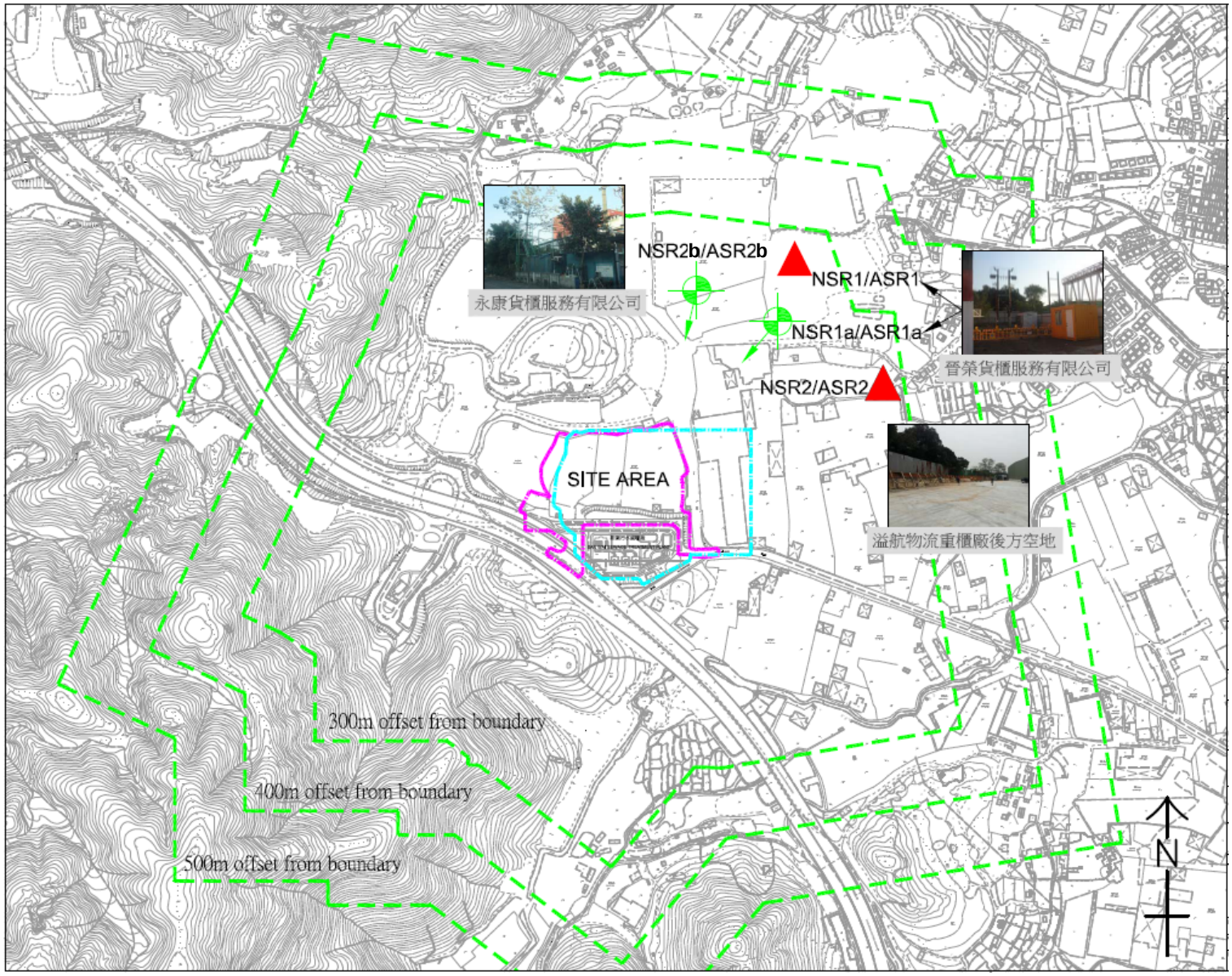
Approved Signatory :
LAU, Chi Leung

TPE/001/W

- END OF REPORT -

Figure 1

Locations of Air Quality and Noise Monitoring Stations

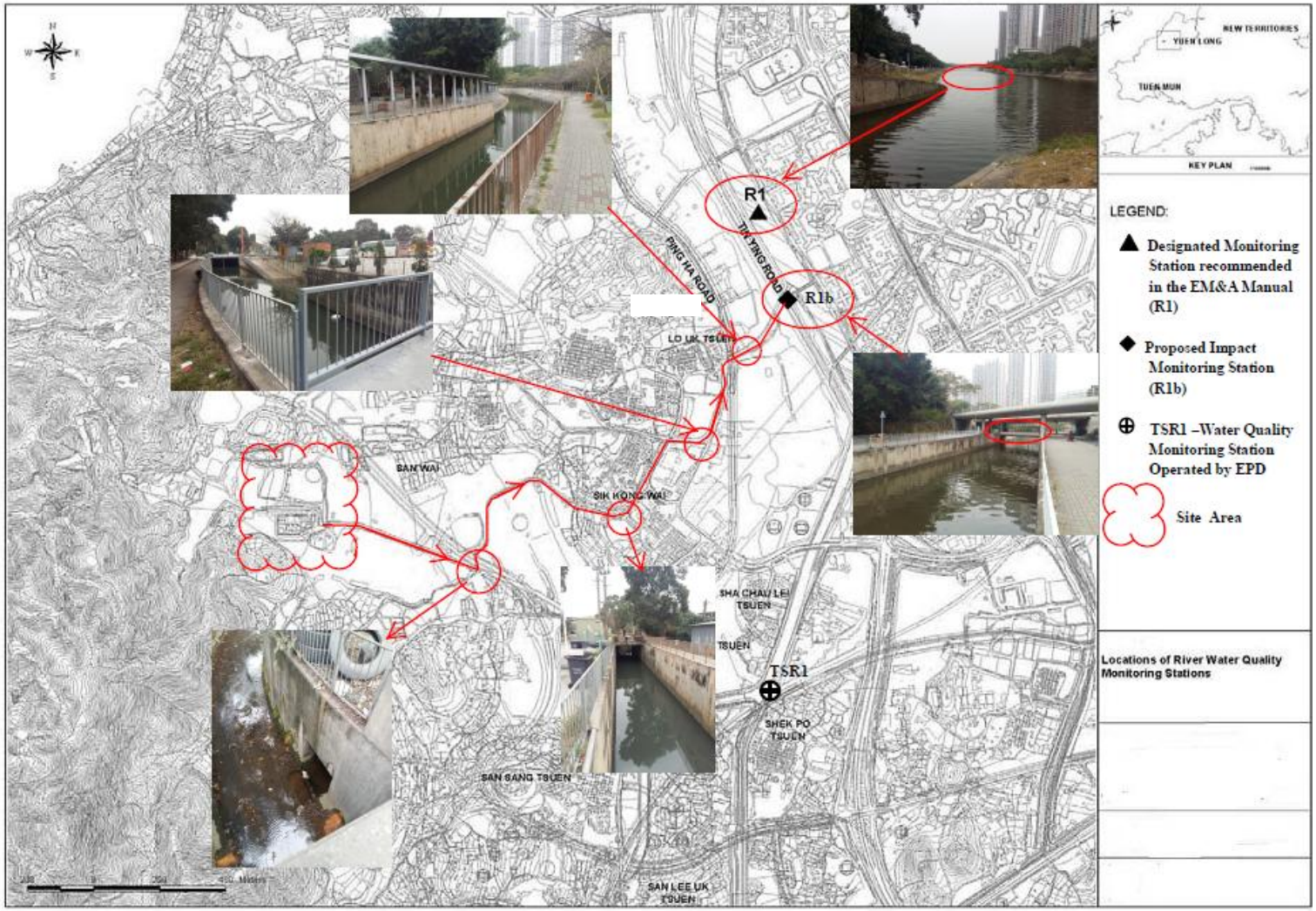


Project: Contract No. DC/2013/10 -Design, Build and Operate San Wai Sewage Treatment Works – Phase 1

Figure 1 Locations of Air Quality and Noise Monitoring Stations

Figure 2

Locations of Water Quality Monitoring Station

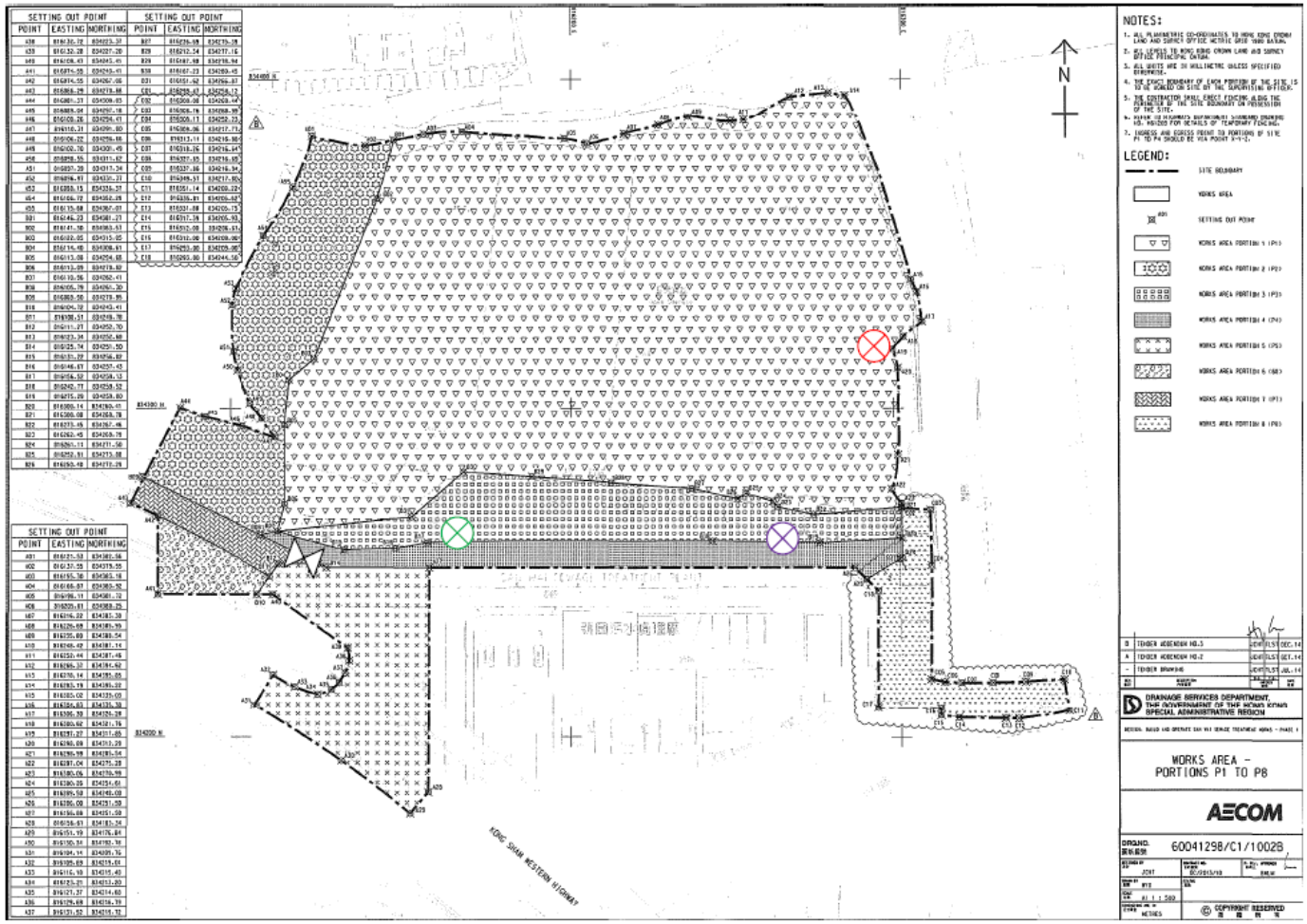


Project: Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Phase 1

Figure 2 Locations of Water Quality Monitoring Station

Figure 3

Location Plan for the Wetsep Treatment Tank



Legend: ⊗ Wetsep treatment tank P1a ⊗ Wetsep treatment tank P1b ⊗ Wetsep treatment tank P8

Project: Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Phase 1

Figure 3 Location Plan for the Wetsep Treatment Tank