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ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE

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

QUARTERLY EM&A REPORT NO. 10

(01 AUGUST 2019 – 31 OCTOBER 2019)

Prepared by: _____
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Certified by: _____
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Environmental Team Leader

Issued Date: 11 November 2019 *Report No.: ENA98781*

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: HKDSD203/50/106142

Date: 20 November 2019

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
Quarterly Environmental Monitoring and Audit Report No.10 (August 2019 – October 2019)

We refer to emails of 11 and 18 November 2019 from ETS-Testconsult Limited attaching the Quarterly Environmental Monitoring and Audit Report No.10 (August 2019 – October 2019).

We have no further comment and hereby verify the Quarterly Environmental Monitoring and Audit Report No.10 (August 2019 – October 2019).

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

Yours faithfully
ANEWR CONSULTING LIMITED

Albert Lee
Independent Environmental Checker

LYMA/LHYF/lhmh

cc AECOM – Mr Patrick Leung (email: patrick.leung@swstw-aecom.com)
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EXECUTIVE SUMMARY

This Quarterly 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 ninth Quarterly 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 August 2019 to 31 October 2019.

Environmental Monitoring and Audit Progress
The quarterly EM&A programme was undertaken in accordance with the EM&A Manual for this Contract. The summary of the monitoring activities in this reporting period is listed below:

- *24-hour TSP Monitoring: 16 Occasions at 2 designated locations*
- *1-hour TSP Monitoring: 48 Occasions at 2 designated locations*
- *Noise Monitoring (Day-time): 16 Occasions at 2 designated locations*
- *Water Quality Monitoring: 40 Occasions at 1 designated location*
- *Weekly Site inspection: 13 Occasions*

Breaches of Action and Limit Levels
Air Quality Monitoring
No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting period.

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

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

Weekly Site Inspections
In general, performance on environmental mitigation measures implemented was found to be satisfactory in this reporting period. The major findings observed during site inspections are presented in the **Section 3.4.**

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.

1 INTRODUCTION

1.1. Basic Project Information

1.1.1. This Quarterly 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**. For any enquiries, hot line telephone (24 hours) at 9083 0560 was established.

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 tenth Quarterly 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 August 2019 to 31 Oct 2019.

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*
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:

- *Water Tightness Test;*
- *Internal ABWF;*
- *External ABWF;*
- *Substructure (RC Structure);*
- *Superstructure (RC);*
- *Retaining Wall, U-Channel & Stormwater Pipe;*
- *Underground Utilities Along EVA*
- *Drainage Inlet Connection (Diversion of 3 Existing Sewage Rising Mains);*
- *Coating;*
- *Concrete Protection Coating;*
- *External Structural Works*
- *Slopes and Retaining Wall*

2 EM&A Requirement

2.1. Summary of EM&A Requirements

2.1.1. 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*

2.2. Monitoring Requirements

2.2.1. Air Quality Monitoring

In accordance with the EM&A Manual, 1-hr and 24-hr TSP air quality monitoring were conducted three times and once per six days correspondingly. Air quality monitoring were conducted at ASR1a (晉榮貨櫃服務有限公司) and ASR2a (永康貨櫃服務有限公司), ASR1a (晉榮貨櫃服務有限公司) and ASR1a (晉榮貨櫃服務有限公司) and ASR2b (永康貨櫃服務有限公司) during November 2018, December 2018 and January 2019 respectively, which was shown in **Figure 1** and **Figure 2**.

2.2.2. Noise Monitoring

Noise levels (L_{eq}, L_{10} and L_{90}) were monitored in the reporting period in accordance with the EM&A Manual. Noise monitoring were performed at NSR1a (晉榮貨櫃服務有限公司) and NSR2a (永康貨櫃服務有限公司), NSR1a (晉榮貨櫃服務有限公司) and NSR1a (晉榮貨櫃服務有限公司) and NSR2b (永康貨櫃服務有限公司) during August 2018, September 2018 and October 2018 respectively, which was shown in **Figure 1** and **Figure 2**.

2.2.3. Water Quality Monitoring

Water quality was monitored 3 times per week in the reporting period in accordance with the EM&A Manual at the one alternative water quality monitoring station, R1b (at Tin Shui Wai Nullah) which shown in **Figure 2**.

2.2.4 The equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports.

2.3. Action and Limit Levels

2.3.1. The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.1**.

Table 2.1 Action and Limit Levels for 1-hr and 24-hr 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*

2.3.2. The Action and Limit Levels for construction noise are provided in **Table 2.2**

Table 2.2 Action and Limit Levels for Construction Noise

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

2.3.3. The Action and Limit Levels for Water Quality are provided in **Table 2.3**

Table 2.3 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*

2.4. Event and Action Plans

2.4.1. The event and action plan is provided in **Appendix G**.

2.5. Mitigation Measures

2.5.1. Environmental mitigation measures for the Contract were recommended in the Approved EIA Report. **Appendix H** lists the recommended mitigation measures and the implementation status.

3 ENVIRONMENTAL MONITORING AND AUDIT

3.1. Air Quality Monitoring Result

3.1.1. No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in this quarter. Graphical presentation of 1-hour and 24-hour TSP monitoring results is shown in **Appendix D**. Wind data included wind speed and wind direction was extracted from Wetland Park Station of Hong Kong Observatory and is presented in **Appendix I**.

3.1.2. 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 quarter.

3.1.3. Apart from the construction activities, the cargo trunks passing through the container yards (晉榮貨櫃服務有限公司 and 永康貨櫃服務有限公司) would also generate dust since the Ha Tsuen Road was mainly made by soil and sand. A part of 1-hour TSP and 24-hour TSP monitoring results were contributed by the cargo trunks.

3.2. Noise Monitoring Results

3.2.1. No exceedance of Action and Limit Level of noise monitoring results was recorded during the reporting quarter. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting period is shown in **Appendix E**.

3.2.2. 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.

3.2.3. Since NSR1a, NSR2a and NSR2b were located inside the container yards, the frequency of vehicles moving in and out the container yards would influence the noise monitoring results.

3.3. Water Quality Monitoring Result

3.3.1. According to the summary of water monitoring results, no exceedance of Action and Limit levels was recorded in this reporting period. Graphical presentation of the monitoring results for the reporting period is shown in **Appendix F**.

3.3.2. 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 period were higher than the action level.

3.3.3. Aside from the discharge, weather condition would be a major factor that affects the water quality in Tin Shui Wan Nallah. In rainy day, the soil and other suspended materials were flushed along the shore and entered the Tin Shui Wai Nullah. Besides, the nullah water would flow rapidly and the sand and stones in the nullah bed were upturned. Thus, the water quality would be deteriorated.

3.4. Site Inspection

3.4.1. Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the project. The dates of environmental site inspections during the reporting period are listed in **Table 3.1**.

Table 3.1 Environmental Site Inspection Date

August 2019	September 2019	October 2019
02, 09, 16, 22 and 29	06, 13, 20 and 27	04, 11, 18 and 25

3.4.2. Observations for the site inspections within this reporting period are summarized in **Table 3.2**.

Table 3.2 Summary of observation of site inspections

Date	Observations / Reminders	Follow-up Action	Closed Date
25 July 2019	1. Stagnant water was observed.	1. Stagnant water was cleared.	02 August 2019
02 August 2019	1. Stagnant pool was observed between CEPT and UV.	1. Stagnant water was cleared.	09 August 2019
09 August 2019	1. General refuse was observed at the pedestrain access along the southern boundary of the site.	1. General refuse was collected.	16 August 2019
16 August 2019	--	--	--
22 August 2019	1. Dust emission was observed at EB2.	1. Water spray was provided.	29 August 2019
29 August 2019	1. Site boundary was found without barrier. 2. Chemical wastes were found without drip tray. 3. Dust Emission were observed near CEPT.	1. The site boundary were ercted properly. 2. Chemical waste was removed. 3. Water spray was provided.	06 September 2019

06 September 2019	1. Fugitive dust emission was observed at the haul roads.	1. Water spray was provided.	13 September 2019
13 September 2019	--	--	--
20 September 2019	1. Fugitive dust emission was observed near the site exit.	1. Water spray was provided.	27 September 2019
27 September 2019	1. Chemical leakage was observed near FH area. 2. Stagnant water was observed near T1 area.	1. Chemical leakages were cleaned. 2. Stagnant water was cleaned.	04 October 2019
04 October 2019	2. Dust emission were observed on hual road	1. Water spray was provided.	11 October 2019
11 October 2019	1. General refuse was observed near south of AB area.	1. General refuse was cleaned	18 October 2019
18 October 2019	2. Stagnant water was observed at CEPT area.	2. Stagnant water was cleaned.	25 October 2019
25 October 2019	1. Stagnant water was observed at CEPT area.	Follow-up actions for outstanding observation will be inspected during the next site inspection.	--

3.5. Advice on the Solid and Liquid Waste Management Status

3.5.1. 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

3.5.2. The quantities of waste for disposal in this reporting period are summarized in the Monthly Summary Waste Flow Table which is shown in **Appendix J**.

3.5.3. 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.

3.6. Landscape and Visual Audit

3.6.1. 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 08 and 23 August 2019, 07 and 20 September 2019, 04 and 25 October 2019.

3.6.2. Observations and reminders were summarized in the landscape and visual impact assessment checklists which are attached in the monthly EM&A reports.

3.7. Discharge License and Results of Effluent Monitoring

3.7.1. Effluent quality was monitored in the reporting quarter in accordance with the EM&A Manual at the discharge point. The location of Wetsep treatment tank was shown in **Figure 3**. 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.

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.

3.7.2. Effluent water samples were sampled by the Contractor. The dates of effluent sampling during the reporting period are listed in **Table 3.3**. On 13 August 2019, only Wetsep at P1a was operated, the effluent water sample was sampled at P1a only on 13 August 2019. While Wetsep were operated at P1b on 29 August 2019, the sample was taken on Wetsep at P1b during this day. During September 2019, only Wetsep at P8 was operated, the effluent water sample was sampled at P8. During October 2019, only Wetsep at P8 was operated, the effluent water sample was sampled at P8

Table 3.3 Effluent Sampling Dates

August 2019	September 2019	October 2019
13 and 29	10 and 24	08 and 22

3.7.3. 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.

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

3.8. Implementation Status of Environmental Mitigation Measures

3.8.1. The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise 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.

4 SUMMARY OF EXCEEDANCE, COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

4.1. Summary of Exceedance of the Environmental Quality Performance Limit

4.1.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2a during this reporting period.

4.1.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2a during the reporting period.

4.1.3. According to the summary of water monitoring results, there was no Action and Limit Level exceedance for water quality monitoring recorded at station R1b during the reporting period.

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

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

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

4.2.3. A summary of environmental complaints, notifications of summons and successful prosecutions was given in **Table 4.1**.

Table 4.1 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

5 COMMENTS, RECOMMENDATIONS AND CONCLUSION

5.1. Comments

5.1.1. According to the environmental site inspection undertaken during the reporting period, the following recommendations were provided:

- The Contractor was reminded to clear all the stagnant water pools;
- The Contractor was reminded to collect the general refuse properly;
- The Contractor was reminded to maintain the Wetsep properly.

5.2. Recommendations

5.2.1. With implementation of the recommended environmental mitigation measures, the contract's environmental impacts were considered environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

5.2.2. The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Contract. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

5.3. Conclusions

5.3.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2a during this reporting period.

5.3.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2a during the reporting period.

5.3.3. According to the summary of water monitoring results, there was no Action and Limit Level exceedance for water quality monitoring recorded at station R1b during the reporting period.

5.3.4. Environmental site inspections were carried out on 02, 09, 16, 22 & 29 August 2019, 06, 13, 20 & 27 September 2019 and 04, 11, 18 & 25 October 2019. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.

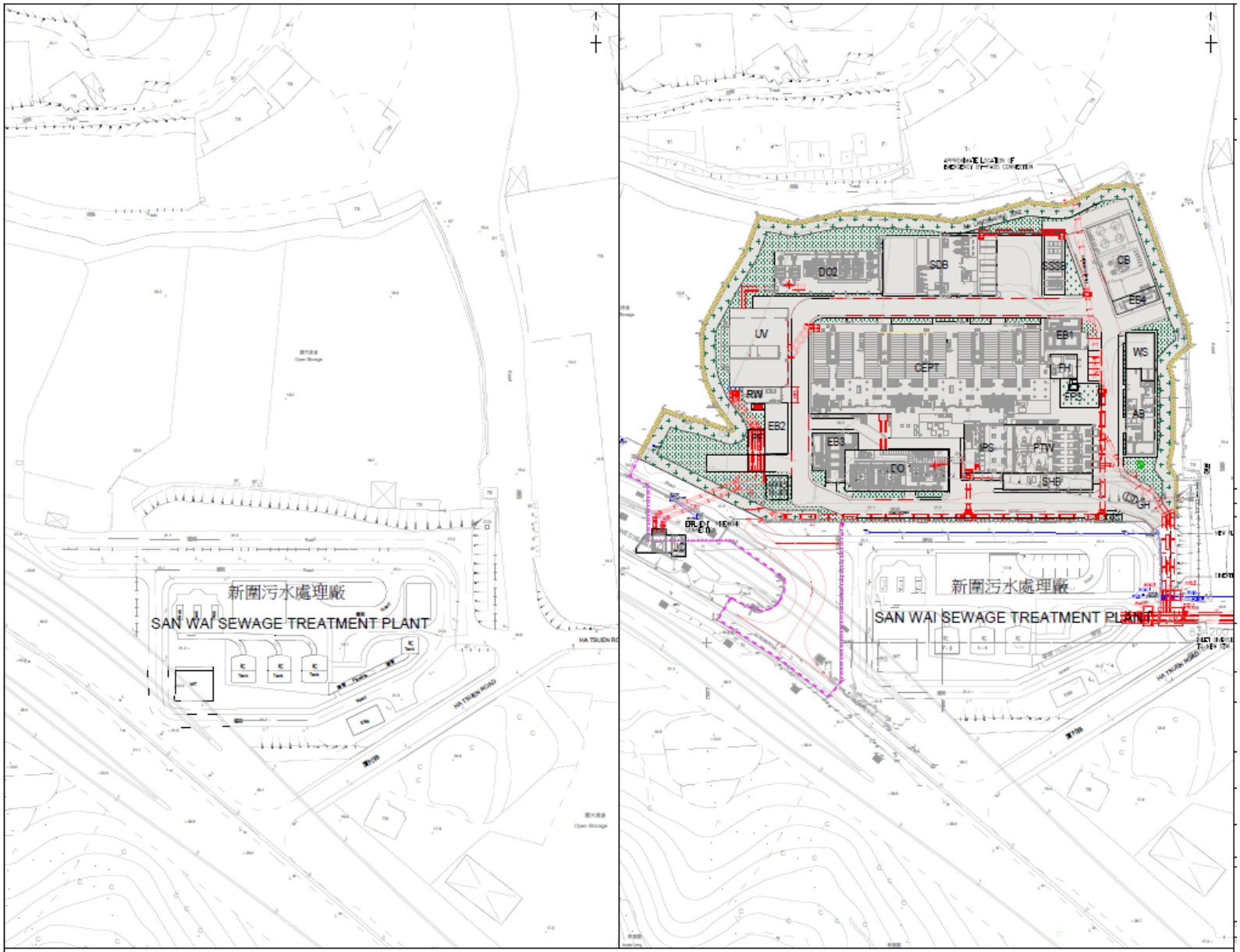
5.3.5. There were no complaints received during the reporting period.

5.3.6. There was no notification of summons and successful prosecution received during the reporting period.

- END OF REPORT -

Appendix A

Location of Works Areas

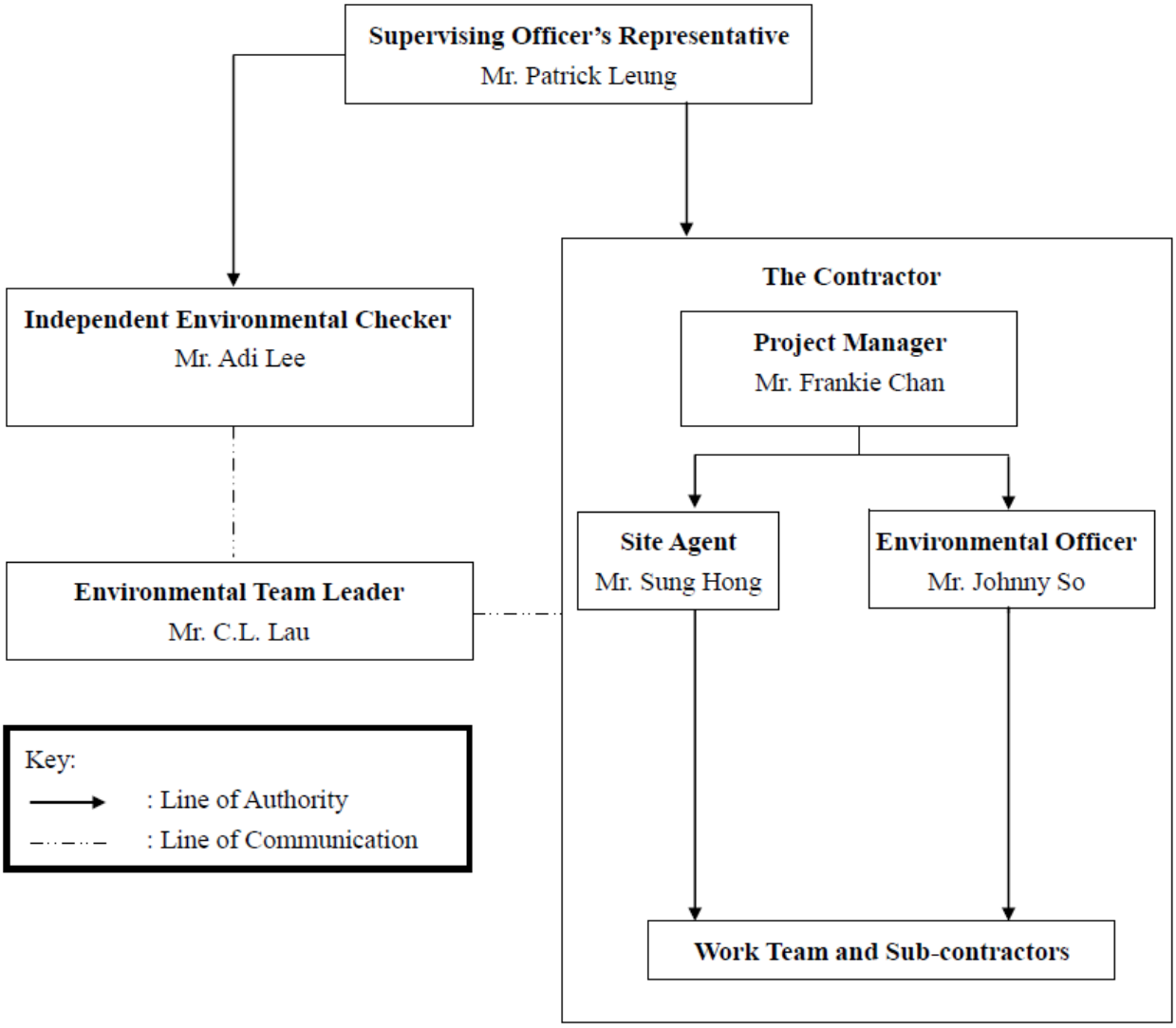


EXISTING SAN WAI SEWAGE TREATMENT WORKS

EXPANDED AND UPGRADED SAN WAI SEWAGE TREATMENT WORKS

Appendix B

Project Organization Chart

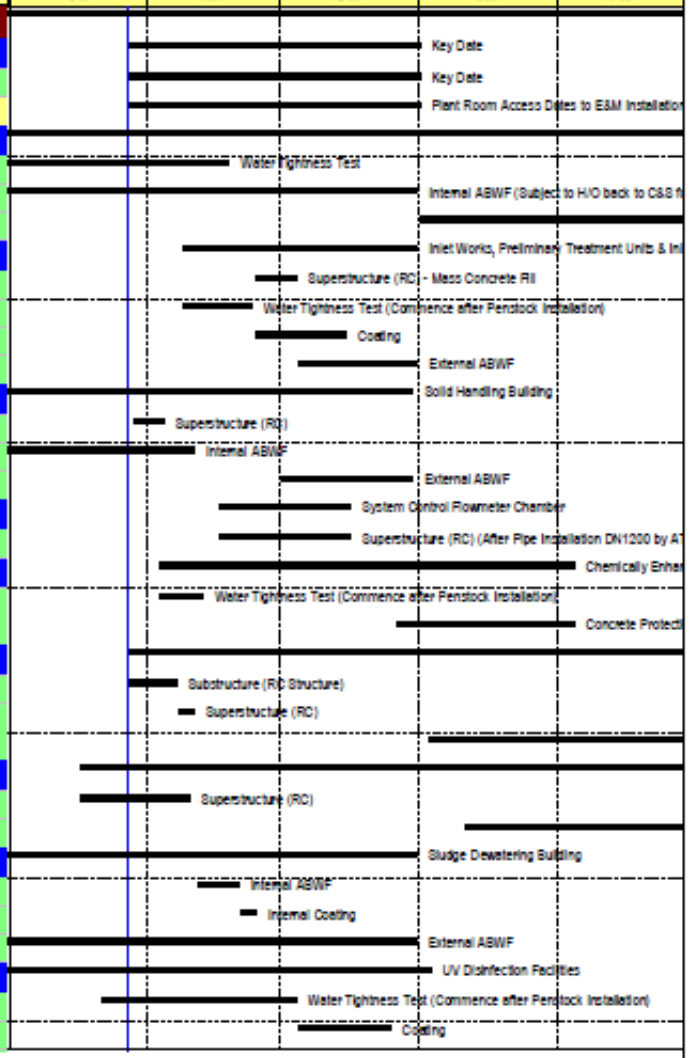

Supervising Officer's Representative
Mr. Patrick Leung
Independent Environmental Checker
Mr. Adi Lee
Environmental Team Leader
Mr. C.L. Lau
The Contractor
Project Manager
Mr. Frankie Chan
Site Agent
Mr. Sung Hong
Environmental Officer
Mr. Johnny So
Work Team and Sub-contractors
Key:
: Line of Authority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

Appendix C

Construction Programme

DATA DATE: 28-Oct-19 | LAYOUT: SW Project PHase 1 TP 3 (3M31Oct19)CODE | PAGE 1 OF 4

Activity ID	Activity Name	At Completion Duration	Start	Finish
	SWSTW Phase 1 - Target Programme Rev. 3 (Update as of 28Oct 2019)	447	21-Jan-19 A	11-Apr-20
	Key Date	65	28-Oct-19	01-Jan-20
	Key Date	65	28-Oct-19	01-Jan-20
	Plant Room Access Dates to E&M Installation	65	28-Oct-19	01-Jan-20
	Administration Building & Maintenance Workshop	437	21-Jan-19 A	01-Apr-20
	Water Tightness Test	97	15-Aug-19 A	19-Nov-19
	Internal ABWF (Subject to H/O back to C&S for Outstanding ABWF)	345	21-Jan-19 A	31-Dec-19
	External ABWF	92	01-Jan-20	01-Apr-20
	Inlet Works, Preliminary Treatment Units & Inlet Pumping Station	53	09-Nov-19	31-Dec-19
	Superstructure (RC) - Mass Concrete Fill	10	25-Nov-19	04-Dec-19
	Water Tightness Test (Commence after Penstock Installation)	16	09-Nov-19	24-Nov-19
	Coating	21	25-Nov-19	15-Dec-19
	External ABWF	27	05-Dec-19	31-Dec-19
	Solid Handling Building	113	09-Sep-19 A	30-Dec-19
	Superstructure (RC)	7	29-Oct-19	04-Nov-19
	Internal ABWF	64	09-Sep-19 A	11-Nov-19
	External ABWF	30	01-Dec-19	30-Dec-19
	System Control Flowmeter Chamber	30	17-Nov-19	16-Dec-19
	Superstructure (RC) (After Pipe Installation DN1200 by ATAL)	30	17-Nov-19	16-Dec-19
	Chemically Enhanced Primary Treatment	93	04-Nov-19	04-Feb-20
	Water Tightness Test (Commence after Penstock Installation)	10	04-Nov-19	13-Nov-19
	Concrete Protection Coating	40	27-Dec-19	04-Feb-20
	Deodorization Facilities No.1	158	28-Oct-19	02-Apr-20
	Substructure (RC Structure)	11	28-Oct-19	07-Nov-19
	Superstructure (RC)	4	08-Nov-19	11-Nov-19
	External Structural Works (Commence after E&M Installation works)	91	03-Jan-20	02-Apr-20
	Deodorization Facilities No.2	178	17-Oct-19 A	11-Apr-20
	Superstructure (RC)	25	17-Oct-19 A	10-Nov-19
	External Structural Works (Commence after E&M Installation works)	91	11-Jan-20	11-Apr-20
	Sludge Dewatering Building	153	01-Aug-19 A	31-Dec-19
	Internal ABWF	10	12-Nov-19	21-Nov-19
	Internal Coating	4	22-Nov-19	25-Nov-19
	External ABWF	153	01-Aug-19 A	31-Dec-19
	UV Disinfection Facilities	152	05-Aug-19 A	03-Jan-20
	Water Tightness Test (Commence after Penstock Installation)	44	22-Oct-19 A	04-Dec-19
	Coating	21	05-Dec-19	25-Dec-19



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

ATAL-Degremont-China Harbour Joint Venture

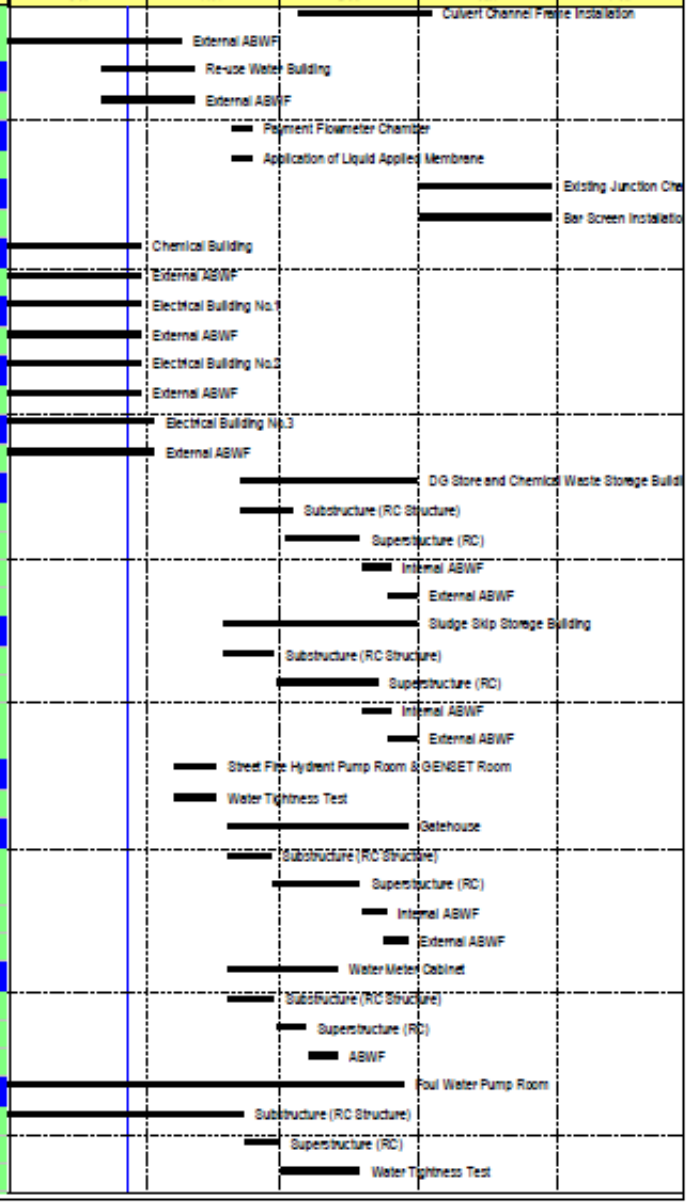
TASK filter: 3 Months Rolling Programme CS Breakdown.

CONTRACT NO. DC/2013/10 DESIGN, BUILD & OPERATE
SAN WAI SEWAGE TREATMENT WORKS - PHASE 1
THREE (3) MONTHS ROLLING PROGRAMME (31 Oct 2019)
C&S WORKS

Date	Revision	Checked	Approved
31-Oct-19	Three (3) Months Rolling Programme...		

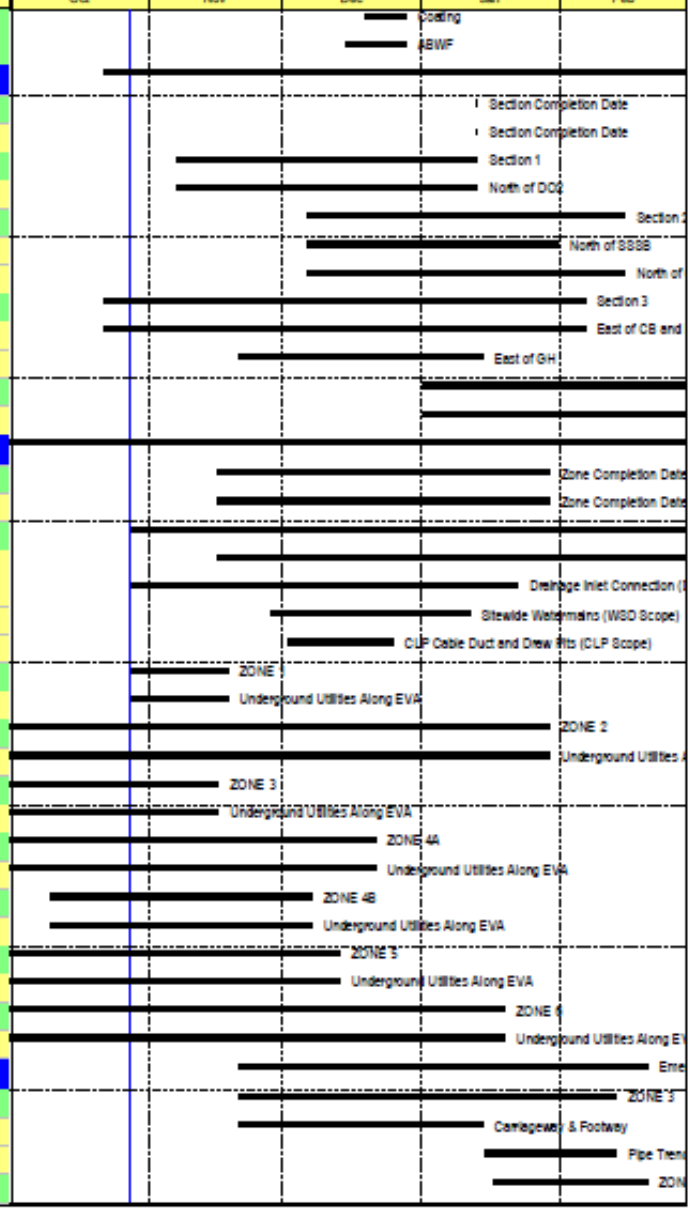
DATA DATE: 28-Oct-19 | LAYOUT: SW Project PHase 1 TP 3 (3M31Oct19)CODE |

Activity ID	Activity Name	At Completion Duration	Start	Finish
	Culvert Channel Frame Installation	30	05-Dec-19	03-Jan-20
	External ABWF	95	05-Aug-19 A	08-Nov-19
	Re-use Water Building	**21**	**22-Oct-19 A**	**11-Nov-19**
	External ABWF	21	22-Oct-19 A	11-Nov-19
	Payment Flowmeter Chamber	**5**	**20-Nov-19**	**24-Nov-19**
	Application of Liquid Applied Membrane	5	20-Nov-19	24-Nov-19
	Existing Junction Chamber	**30**	**01-Jan-20**	**30-Jan-20**
	Bar Screen Installation	30	01-Jan-20	30-Jan-20
	Chemical Building	**87**	**05-Aug-19 A**	**30-Oct-19**
	External ABWF	87	05-Aug-19 A	30-Oct-19
	Electrical Building No.1	**87**	**05-Aug-19 A**	**30-Oct-19**
	External ABWF	87	05-Aug-19 A	30-Oct-19
	Electrical Building No.2	**91**	**01-Aug-19 A**	**30-Oct-19**
	External ABWF	91	01-Aug-19 A	30-Oct-19
	Electrical Building No.3	**69**	**26-Aug-19 A**	**02-Nov-19**
	External ABWF	69	26-Aug-19 A	02-Nov-19
	DG Store and Chemical Waste Storage Building and Irrigation & Cleansing Water Pump Room	**40**	**22-Nov-19**	**31-Dec-19**
	Substructure (RC Structure)	12	22-Nov-19	03-Dec-19
	Superstructure (RC)	17	02-Dec-19	18-Dec-19
	Internal ABWF	7	19-Dec-19	25-Dec-19
	External ABWF	7	25-Dec-19	31-Dec-19
	Sludge Skip Storage Building	**44**	**18-Nov-19**	**31-Dec-19**
	Substructure (RC Structure)	12	18-Nov-19	29-Nov-19
	Superstructure (RC)	23	30-Nov-19	22-Dec-19
	Internal ABWF	7	19-Dec-19	25-Dec-19
	External ABWF	7	25-Dec-19	31-Dec-19
	Street Fire Hydrant Pump Room & GENSET Room	**10**	**07-Nov-19**	**16-Nov-19**
	Water Tightness Test	10	07-Nov-19	16-Nov-19
	Gatehouse	**41**	**19-Nov-19**	**29-Dec-19**
	Substructure (RC Structure)	10	19-Nov-19	28-Nov-19
	Superstructure (RC)	20	29-Nov-19	18-Dec-19
	Internal ABWF	6	19-Dec-19	24-Dec-19
	External ABWF	6	24-Dec-19	29-Dec-19
	Water Meter Cabinet	**25**	**19-Nov-19**	**13-Dec-19**
	Substructure (RC Structure)	11	19-Nov-19	29-Nov-19
	Superstructure (RC)	7	30-Nov-19	06-Dec-19
	ABWF	7	07-Dec-19	13-Dec-19
	Foul Water Pump Room	**135**	**16-Aug-19 A**	**28-Dec-19**
	Substructure (RC Structure)	99	16-Aug-19 A	22-Nov-19
	Superstructure (RC)	8	23-Nov-19	30-Nov-19
	Water Tightness Test	18	01-Dec-19	18-Dec-19



DATA DATE: 28-Oct-19 | LAYOUT: SW Project PHase 1 TP 3 (3M31Oct19)CODE | PAGE 3 OF 4

Activity ID	Activity Name	At Completion Duration	Start	Finish
	Coating	10	19-Dec-19	28-Dec-19
	ABWF	14	15-Dec-19	28-Dec-19
	Slopes and Retaining Wall	**132**	**22-Oct-19 A**	**01-Mar-20**
	Section Completion Date	0	13-Jan-20	13-Jan-20
	Section Completion Date	0	13-Jan-20	13-Jan-20
	Section 1	68	07-Nov-19	13-Jan-20
	North of DO2	68	07-Nov-19	13-Jan-20
	Section 2	71	06-Dec-19	15-Feb-20
	North of SSSB	56	06-Dec-19	31-Jan-20
	North of CB, EB4 and SDB	71	06-Dec-19	15-Feb-20
	Section 3	108	22-Oct-19 A	06-Feb-20
	East of CB and EB4	108	22-Oct-19 A	06-Feb-20
	East of GH	55	21-Nov-19	14-Jan-20
	Slope	61	01-Jan-20	01-Mar-20
	West Side of the Project	61	01-Jan-20	01-Mar-20
	Underground Utilities Along EVA	**213**	**16-Aug-19 A**	**15-Mar-20**
	Zone Completion Dates	74	15-Nov-19	29-Jan-20
	Zone Completion Dates	74	15-Nov-19	29-Jan-20
	P8 Area	140	28-Oct-19 A	15-Mar-20
	Retaining Wall, U-Channel & Stormwater Pipe	121	15-Nov-19	15-Mar-20
	Drainage Inlet Connection (Diversion of 3 Existing Sewage Rising Mains)	87	28-Oct-19 A	22-Jan-20
	Sitewide Watermains (WSD Scope)	45	28-Nov-19	11-Jan-20
	CLP Cable Duct and Draw Pits (CLP Scope)	24	02-Dec-19	25-Dec-19
	ZONE 1	22	28-Oct-19 A	18-Nov-19
	Underground Utilities Along EVA	22	28-Oct-19 A	18-Nov-19
	ZONE 2	131	21-Sep-19 A	29-Jan-20
	Underground Utilities Along EVA	131	21-Sep-19 A	29-Jan-20
	ZONE 3	93	16-Aug-19 A	16-Nov-19
	Underground Utilities Along EVA	93	16-Aug-19 A	16-Nov-19
	ZONE 4A	111	02-Sep-19 A	21-Dec-19
	Underground Utilities Along EVA	111	02-Sep-19 A	21-Dec-19
	ZONE 4B	59	10-Oct-19 A	07-Dec-19
	Underground Utilities Along EVA	59	10-Oct-19 A	07-Dec-19
	ZONE 5	76	29-Sep-19 A	13-Dec-19
	Underground Utilities Along EVA	76	29-Sep-19 A	13-Dec-19
	ZONE 6	111	01-Oct-19 A	19-Jan-20
	Underground Utilities Along EVA	111	01-Oct-19 A	19-Jan-20
	Emergency Vehicle Access Road	**92**	**21-Nov-19**	**20-Feb-20**
	ZONE 3	85	21-Nov-19	13-Feb-20
	Carriageway & Footway	55	21-Nov-19	14-Jan-20
	Pipe Trench	30	15-Jan-20	13-Feb-20
	ZONE 5	35	17-Jan-20	20-Feb-20

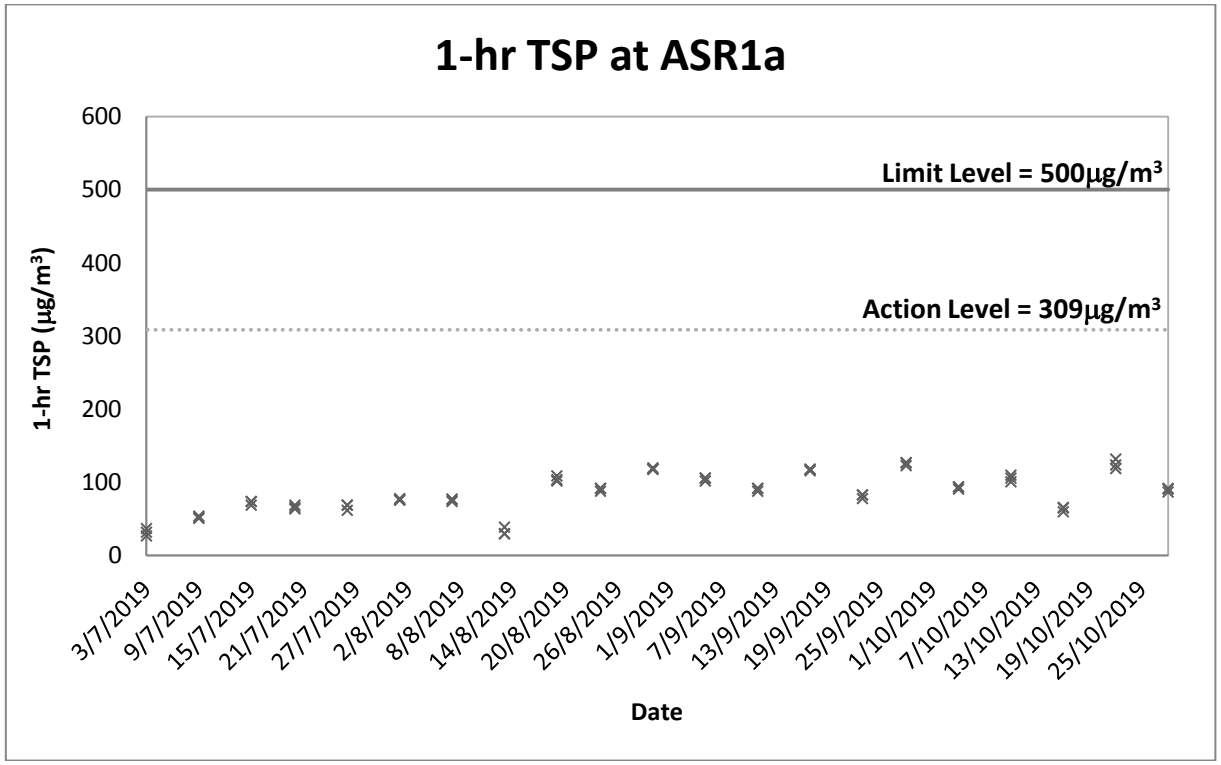


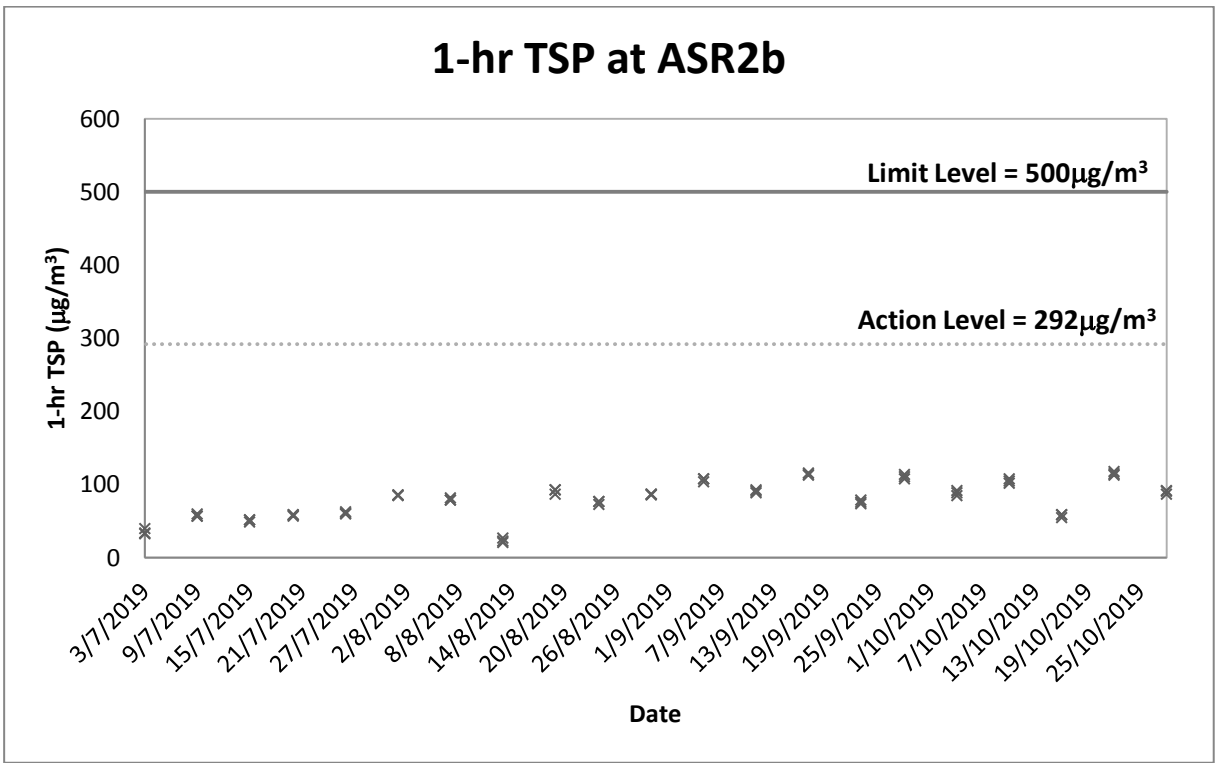
DATA DATE: 28-Oct-19 | LAYOUT: SW Project PHase 1 TP 3 (3M31Oct19)CODE | PAGE 4 OF 4

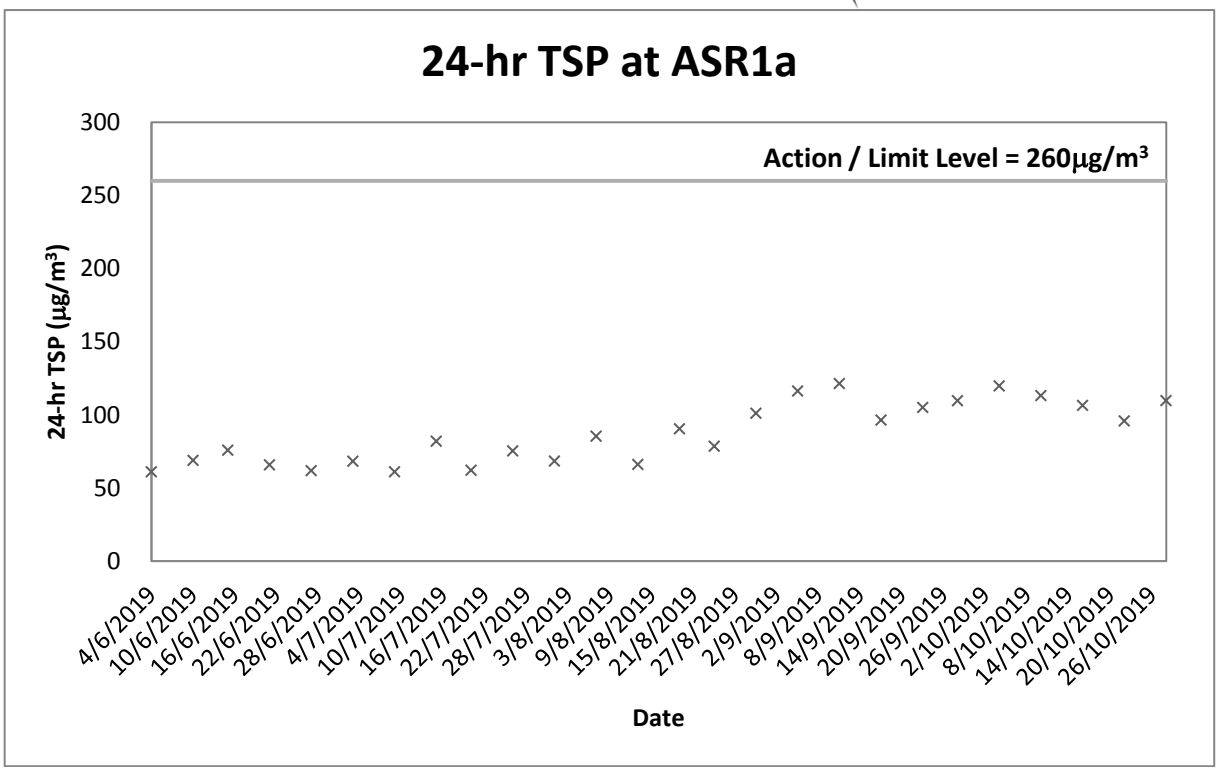
Activity ID	Activity Name	At Completion Duration	Start	Finish
	Carriageway & Footway	35	17-Jan-20	20-Feb-20
	Pipe Trench	15	17-Jan-20	31-Jan-20
	ZONE 6	25	20-Jan-20	13-Feb-20
	Carriageway & Footway	25	20-Jan-20	13-Feb-20

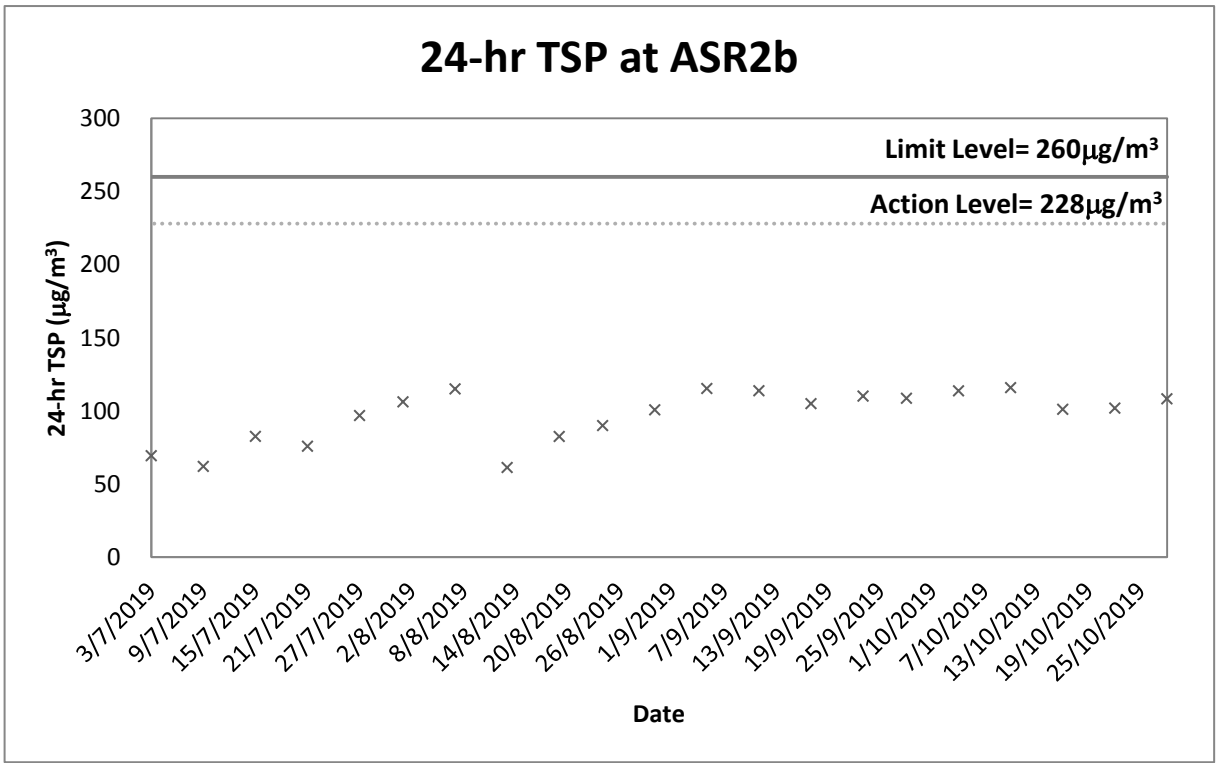
Appendix D

Graphical Plots of Impact Air Quality Monitoring Results


1-hr TSP at ASR1a
600
500
400
300
200
100
0
1-hr TSP (μg/m³)
Limit Level = 500μg/m³
Action Level = 309μg/m³
3/7/2019
9/7/2019
15/7/2019
21/7/2019
27/7/2019
2/8/2019
8/8/2019
14/8/2019
20/8/2019
26/8/2019
1/9/2019
7/9/2019
13/9/2019
19/9/2019
25/9/2019
1/10/2019
7/10/2019
13/10/2019
19/10/2019
25/10/2019
Date

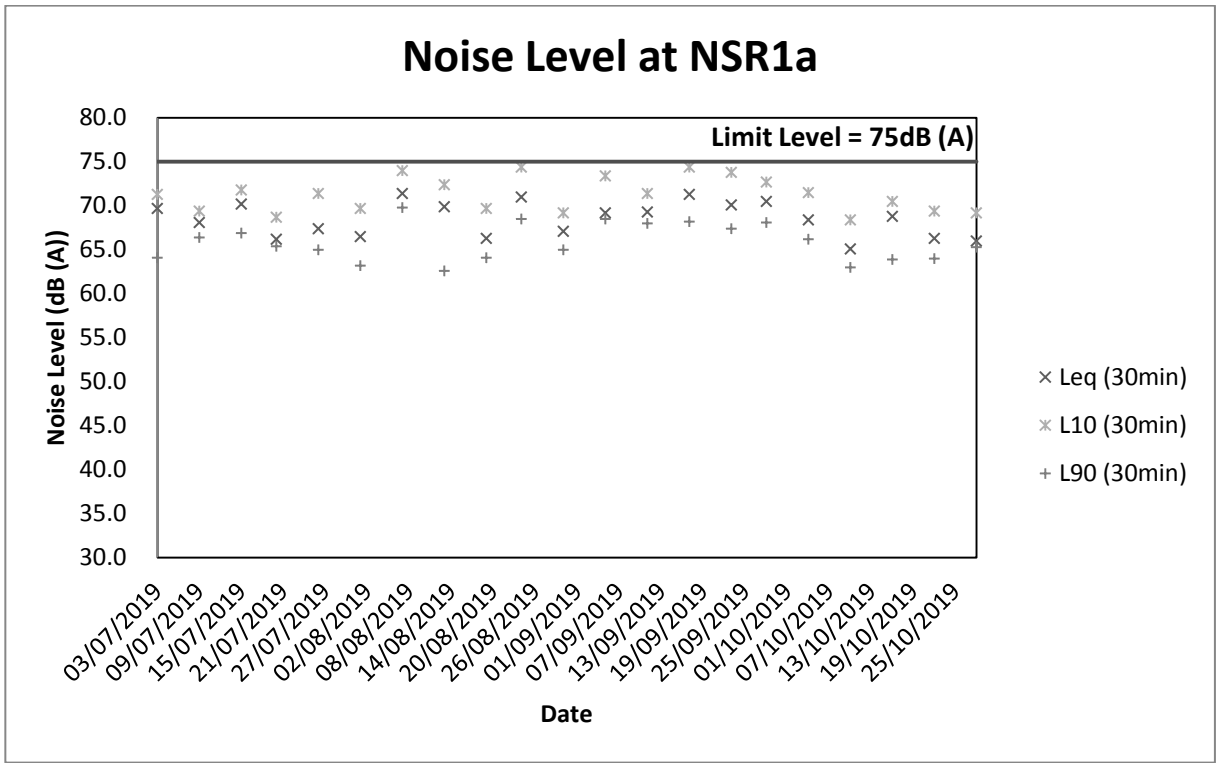

1-hr TSP at ASR2b
600
500
400
300
200
100
0
1-hr TSP (μg/m³)
Limit Level = 500μg/m³
Action Level = 292μg/m³
3/7/2019
9/7/2019
15/7/2019
21/7/2019
27/7/2019
2/8/2019
8/8/2019
14/8/2019
20/8/2019
26/8/2019
1/9/2019
7/9/2019
13/9/2019
19/9/2019
25/9/2019
1/10/2019
7/10/2019
13/10/2019
19/10/2019
25/10/2019
Date

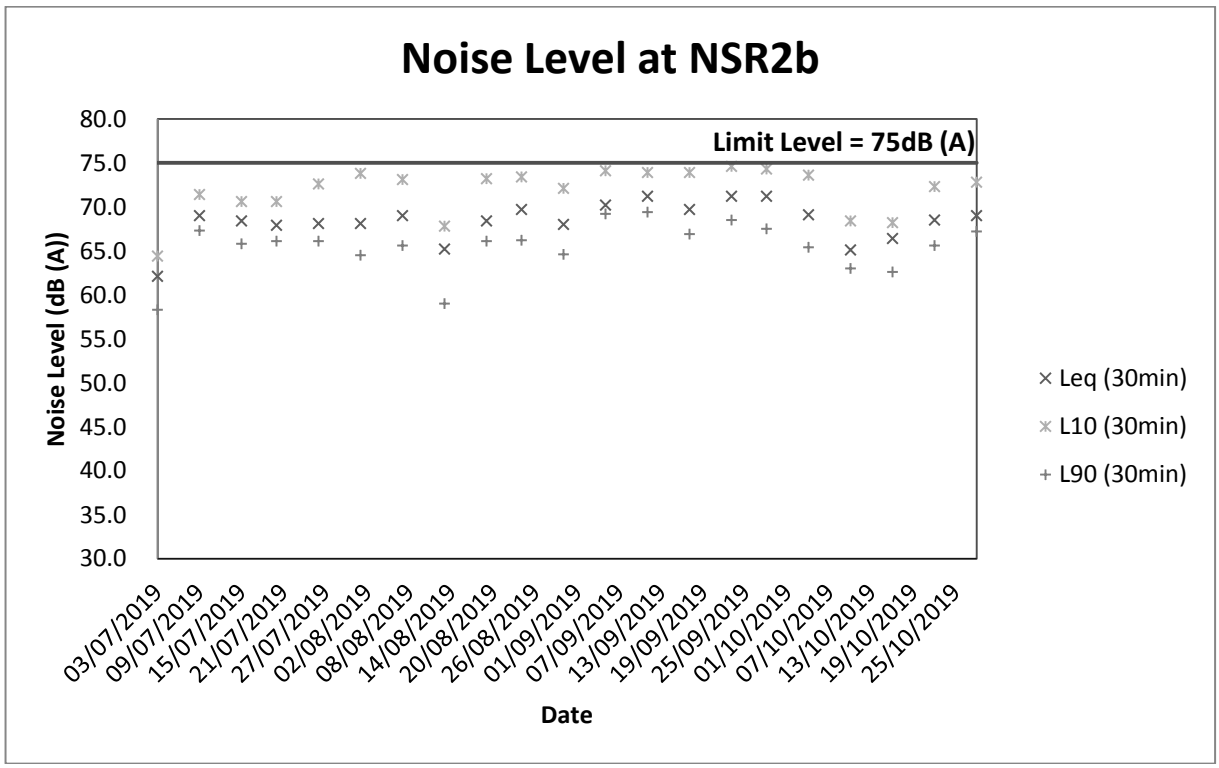

24-hr TSP at ASR1a
Action / Limit Level = 260μg/m³
24-hr TSP (μg/m³)
300
250
200
150
100
50
0
4/6/2019
10/6/2019
16/6/2019
22/6/2019
28/6/2019
4/7/2019
10/7/2019
16/7/2019
22/7/2019
28/7/2019
3/8/2019
9/8/2019
15/8/2019
21/8/2019
27/8/2019
2/9/2019
8/9/2019
14/9/2019
20/9/2019
26/9/2019
2/10/2019
8/10/2019
14/10/2019
20/10/2019
26/10/2019
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
3/7/2019
9/7/2019
15/7/2019
21/7/2019
27/7/2019
2/8/2019
8/8/2019
14/8/2019
20/8/2019
26/8/2019
1/9/2019
7/9/2019
13/9/2019
19/9/2019
25/9/2019
1/10/2019
7/10/2019
13/10/2019
19/10/2019
25/10/2019
Date

Appendix E

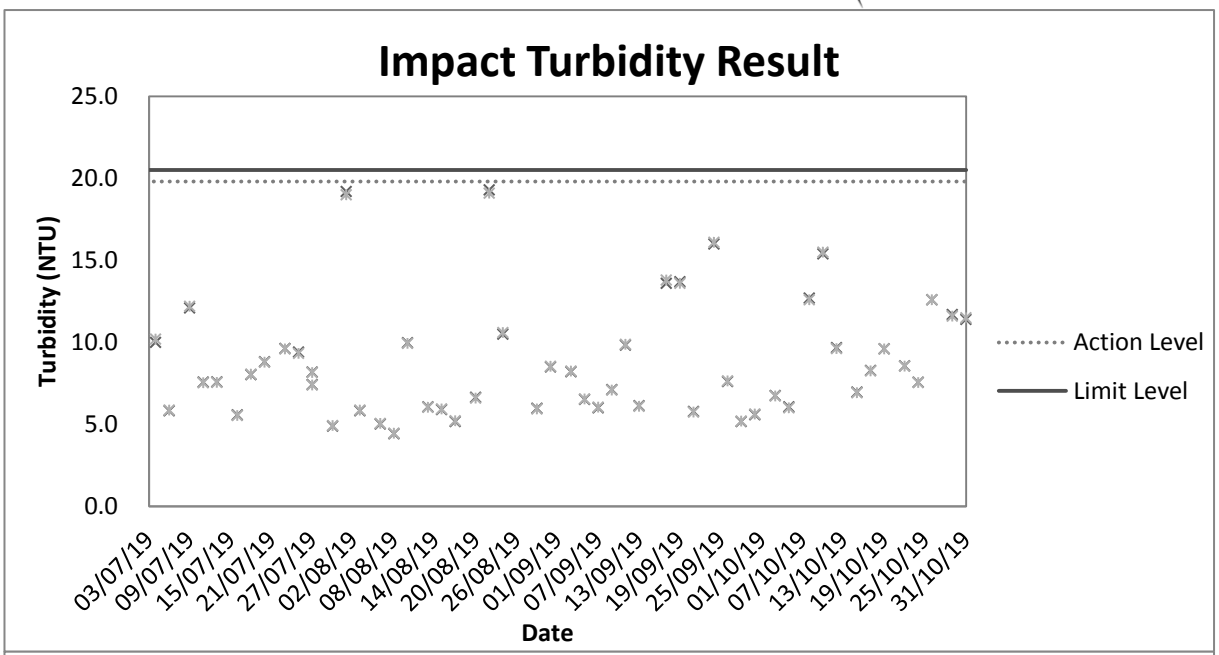
Graphical Plots of Impact Noise Monitoring Data

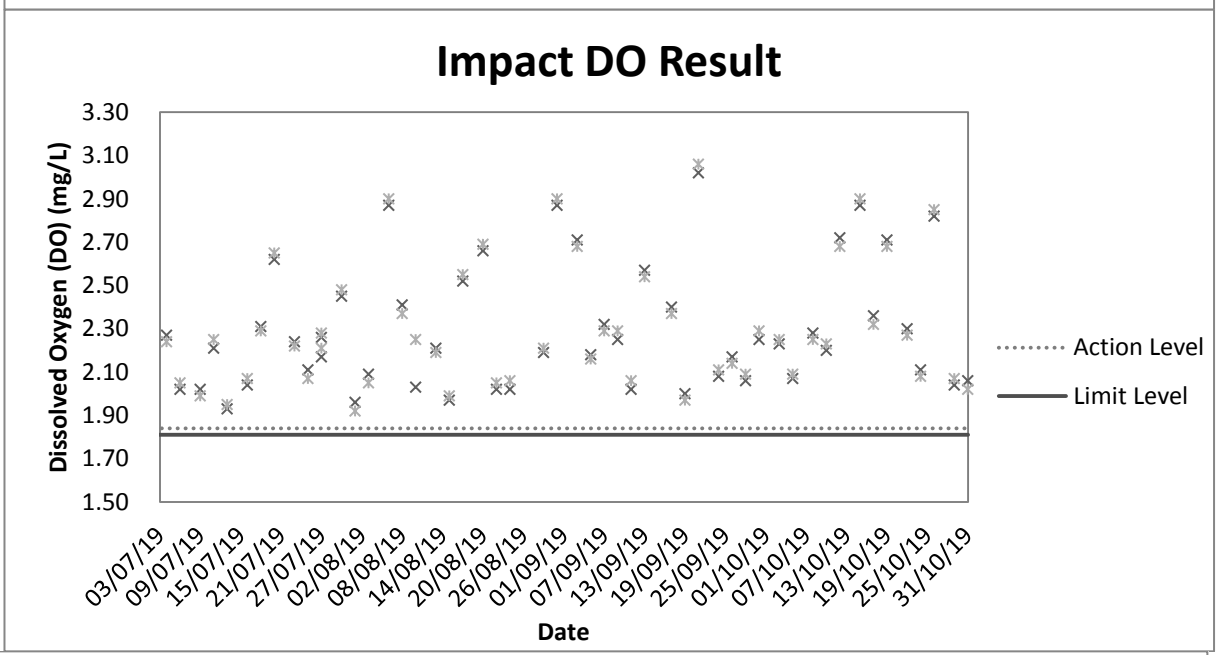

Noise Level at NSR1a
Limit Level = 75dB (A)
Noise Level (dB (A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
03/07/2019
09/07/2019
15/07/2019
21/07/2019
27/07/2019
02/08/2019
08/08/2019
14/08/2019
20/08/2019
26/08/2019
01/09/2019
07/09/2019
13/09/2019
19/09/2019
25/09/2019
01/10/2019
07/10/2019
13/10/2019
19/10/2019
25/10/2019
Date
Leq (30min)
L10 (30min)
L90 (30min)

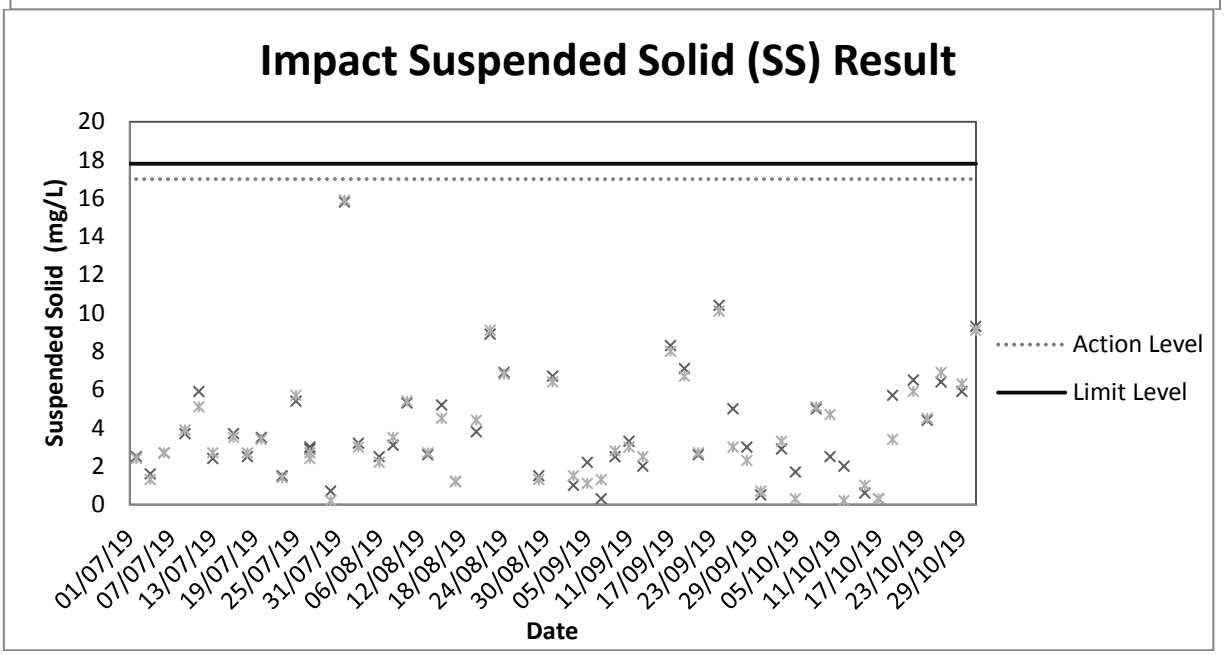

Noise Level at NSR2b
Limit Level = 75dB (A)
Noise Level (dB (A))
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
03/07/2019
09/07/2019
15/07/2019
21/07/2019
27/07/2019
02/08/2019
08/08/2019
14/08/2019
20/08/2019
26/08/2019
01/09/2019
07/09/2019
13/09/2019
19/09/2019
25/09/2019
01/10/2019
07/10/2019
13/10/2019
19/10/2019
25/10/2019
Date
Leq (30min)
L10 (30min)
L90 (30min)

Appendix F

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
03/07/19
09/07/19
15/07/19
21/07/19
27/07/19
02/08/19
08/08/19
14/08/19
20/08/19
26/08/19
01/09/19
07/09/19
13/09/19
19/09/19
25/09/19
01/10/19
07/10/19
13/10/19
19/10/19
25/10/19
31/10/19
Date
Action Level
Limit Level


Impact DO Result
Dissolved Oxygen (DO) (mg/L)
3.30
3.10
2.90
2.70
2.50
2.30
2.10
1.90
1.70
1.50
03/07/19
09/07/19
15/07/19
21/07/19
27/07/19
02/08/19
08/08/19
14/08/19
20/08/19
26/08/19
01/09/19
07/09/19
13/09/19
19/09/19
25/09/19
01/10/19
07/10/19
13/10/19
19/10/19
25/10/19
31/10/19
Date
Action Level
Limit Level


Impact Suspended Solid (SS) Result
Suspended Solid (mg/L)
20
18
16
14
12
10
8
6
4
2
0
01/07/19
07/07/19
13/07/19
19/07/19
25/07/19
31/07/19
06/08/19
12/08/19
18/08/19
24/08/19
30/08/19
05/09/19
11/09/19
17/09/19
23/09/19
29/09/19
05/10/19
11/10/19
17/10/19
23/10/19
29/10/19
Date
Action Level
Limit Level

Appendix G

Event and Action Plan

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 effectiveness of Contractor's	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	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with IEC and Contractor on potential	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. Amend proposal if

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	remedial actions; 6. Keep EPD and ER informed of the results.	measures submitted by Contractor and advise the ER accordingly.	remedial actions; 5. Ensure remedial actions properly implemented.	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.

Event and 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; 7. Assess the	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 to stop that	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 exceedance

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

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 Contractor; 6. 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; 6. Implement the agreed mitigation 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	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented;	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and

Event	Action			
	ET Leader	IEC	ER	Contractor
	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.	and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	3. Assess the effectiveness of the implemented mitigation measures.	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; 3. Inform IEC, Contract or 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	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.	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 measures.

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

Appendix H

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					
1. 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 I

Weather Condition

Daily Extract of Meteorological Observations, August 2019

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)			
01	1000.1	27.6	26.4	24.9	25.2	94	98.3
02	1002.1	28.5	27.0	25.4	25.3	91	8.2
03	1002.7	27.5	26.7	25.3	25.1	91	28.4
04	1002.7	30.2	27.9	26.9	24.6	83	Trace
05	1003.1	34.5	29.7	26.5	25.0	77	0.0
06	1002.7	32.2	29.8	28.7	25.4	78	Trace
07	1000.7	33.6	30.1	28.0	23.8	70	0.0
08	998.5	33.5	30.4	27.7	25.1	74	0.0
09	997.2	35.1	31.3	28.1	26.2	75	0.0
10	999.0	33.2	30.6	29.4	27.4	83	0.0
11	1000.7	32.7	30.4	29.2	26.9	82	1.1
12	1001.6	34.0	30.8	29.2	27.0	80	0.4
13	1001.7	33.3	30.8	28.8	26.6	79	9.2
14	1002.0	33.4	30.0	25.2	26.2	80	54.4
15	1001.9	32.4	30.0	26.5	25.8	79	5.6
16	1003.4	32.0	30.0	27.6	26.2	81	1.1
17	1005.6	30.1	28.0	25.9	25.5	87	42.2
18	1005.1	31.6	27.8	25.0	25.2	86	19.0
19	1003.9	31.8	28.8	26.8	25.6	83	0.1
20	1004.8	31.7	29.1	28.0	25.2	79	Trace
21	1005.9	32.8	29.5	27.6	24.3	74	0.0
22	1006.6	33.0	29.7	27.5	25.3	77	0.0
23	1006.7	31.4	29.4	28.2	25.5	80	0.7
24	1002.3	33.9	30.9	27.7	25.9	75	0.0
25	1000.8	32.6	27.2	25.1	25.2	89	88.4
26	1006.3	28.7	25.7	22.9	24.7	95	178.3
27	1008.1	31.4	28.6	26.9	26.3	88	2.9
28	1006.2	33.8	29.9	27.2	25.4	77	0.0
29	1005.6	30.7	29.0	27.8	25.8	83	5.9
30	1007.6	30.1	27.7	25.0	25.1	86	8.5
31	1007.8	30.3	26.9	25.0	25.3	91	43.7
Mean/Total	1003.3	31.9	29.0	26.9	25.6	82	596.4
Normal[§]	1005.2	31.1	28.6	26.6	25.0	81	432.2

Remark(s):

1. *Trace means rainfall less than 0.05 mm*
2. *§ 1981-2010 Climatological Normal*
3. *The* meteorological observations extracted from Hong Kong Observatory only shown the daily average and may be varied from the weather condition recorded during monitoring.

Daily Extract of Meteorological Observations, September 2019

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)			
01	1006.5	31.0	28.2	26.2	24.7	82	8.5
02	1007.0	28.1	26.9	25.2	25.2	90	38.4
03	1005.6	30.9	28.4	26.2	24.6	80	12.9
04	1004.0	28.3	26.8	25.5	25.1	91	62.2
05	1003.1	29.3	27.2	25.4	25.1	88	31.8
06	1002.5	32.4	28.9	26.8	24.9	79	0.2
07	1003.6	33.3	29.8	27.5	25.6	79	0.4
08	1004.7	33.0	30.0	28.0	26.2	80	0.4
09	1005.8	33.3	30.0	28.3	25.7	78	0.0
10	1008.9	33.3	30.1	28.2	25.2	76	0.0
11	1011.3	33.3	30.2	28.4	24.6	73	Trace
12	1009.9	33.5	30.3	28.3	24.8	73	0.0
13	1008.4	33.0	30.1	28.7	25.6	77	Trace
14	1008.4	32.3	29.8	28.4	25.5	78	Trace
15	1008.2	32.2	29.2	25.9	24.4	76	11.0
16	1007.7	32.3	29.3	26.3	24.5	76	4.3
17	1009.0	31.8	29.2	27.9	24.5	76	2.1
18	1010.9	32.0	28.8	25.8	24.7	79	18.0
19	1011.3	32.4	28.0	24.9	22.7	74	8.7
20	1008.7	32.6	29.0	26.2	17.5	52	0.0
21	1008.0	32.5	29.2	26.5	14.8	42	0.0
22	1012.2	31.3	28.3	25.9	13.1	40	0.0
23	1016.2	30.7	27.7	25.4	18.4	57	0.0
24	1017.5	30.3	27.5	26.3	21.5	70	0.0
25	1017.3	30.8	27.3	25.7	21.4	71	Trace
26	1017.2	30.8	27.5	25.5	21.6	71	0.0
27	1016.6	30.6	27.6	25.7	21.9	72	Trace
28	1015.0	32.2	28.2	25.9	22.2	71	0.0
29	1012.8	31.7	28.7	26.6	23.7	75	0.0
30	1008.8	33.4	30.1	27.2	22.0	64	0.0
Mean/Total	1009.6	31.8	28.7	26.6	23.1	73	198.9
Normal[§]	1008.9	30.1	27.7	25.8	23.4	78	327.6

Remark(s):

1. *Trace means rainfall less than 0.05 mm*
2. *§ 1981-2010 Climatological Normal*
3. *The* meteorological observations extracted from Hong Kong Observatory only shown the daily average and may be varied from the weather condition recorded during monitoring.

Daily Extract of Meteorological Observations, October 2019

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)			
01	1009.4	33.2	30.3	28.4	21.2	59	0.0
02	1011.2	32.1	29.5	27.9	23.7	71	0.0
03	1012.1	31.8	29.0	27.4	22.3	67	0.0
04	1012.2	31.3	28.6	26.9	22.4	70	0.0
05	1012.9	32.3	29.1	26.8	22.7	69	0.0
06	1014.7	29.1	26.3	23.1	22.8	81	46.8
07	1015.4	28.3	26.3	23.2	23.7	86	17.9
08	1015.6	30.4	27.7	25.3	23.6	79	4.9
09	1014.7	29.8	27.8	26.7	22.9	75	Trace
10	1013.5	30.3	27.9	26.6	23.3	76	0.0
11	1011.8	31.1	28.5	26.3	23.5	75	0.0
12	1011.8	31.5	28.6	27.4	24.4	78	0.3
13	1014.6	30.8	27.2	24.5	24.2	84	13.6
14	1017.6	28.9	25.8	24.2	23.1	86	52.1
15	1019.0	29.7	26.0	23.1	20.8	74	10.4
16	1018.3	28.9	25.5	23.2	18.9	67	0.0
17	1017.2	29.7	26.2	23.9	20.1	70	0.0
18	1016.9	29.0	26.5	24.7	20.3	70	Trace
19	1017.2	29.6	26.2	24.2	20.7	72	0.0
20	1016.5	28.3	25.4	23.4	20.7	76	3.5
21	1014.0	28.8	25.3	23.5	19.9	72	0.0
22	1012.2	28.0	25.0	23.4	18.6	68	0.0
23	1012.2	28.7	25.5	23.5	19.8	71	0.0
24	1014.9	29.5	26.2	24.5	20.4	71	0.0
25	1016.7	28.3	25.8	24.3	21.0	75	0.0
26	1017.0	28.3	25.9	24.7	21.0	75	Trace
27	1015.3	29.0	25.7	24.0	21.3	76	Trace
28	1014.7	29.0	25.2	22.4	20.8	77	Trace
29	1015.7	24.7	22.7	20.3	15.9	65	0.0
30	1016.7	26.4	24.0	21.5	15.6	60	0.0
31	1016.2	27.2	24.8	23.2	18.3	68	149.5
Mean/Total	1014.8	29.5	26.6	24.6	21.2	73	100.9

Remark(s):

1. *Trace means rainfall less than 0.05 mm*
2. *§ 1981-2010 Climatological Normal*
3. *The* meteorological observations extracted from Hong Kong Observatory only shown the daily average and may be varied from the weather condition recorded during monitoring.

Appendix J

Waste Flow Table

Name of Department: DSD

Year: 2019

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 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	0.988	0.000	0.000	0.000	0.988	0.449	0.000	0.000	0.000	0.000	55.820
Feb	0.632	0.000	0.000	0.000	0.632	0.637	0.000	0.300	0.000	0.000	87.830
Mar	0.750	0.000	0.000	0.000	0.750	0.182	0.000	0.000	0.000	0.000	103.440
Apr	0.625	0.000	0.000	0.000	0.625	0.024	0.000	0.200	0.000	0.000	129.800
May	0.442	0.000	0.206	0.000	0.442	0.032	0.000	0.000	0.000	0.000	186.750
Jun	2.408	0.000	0.000	0.000	2.408	1.217	0.000	0.000	0.000	0.000	125.740
Jul	1.619	0.000	0.000	0.000	1.619	2.091	0.000	0.100	0.000	0.111	348.460
Aug	2.506	0.000	0.000	0.000	2.506	1.923	0.000	0.000	0.000	0.000	132.580
Sep	2.342	0.000	0.000	0.000	2.342	0.444	0.000	0.100	0.000	0.000	102.690
Oct	0.659	0.000	0.000	0.000	0.659	1.9253	0.000	0.000	0.000	0.000	171.380
Nov											
Dec											
Total	12.971	0.000	0.206	0.000	12.971	8.9243	0.000	0.700	0.000	0.111	1444.49

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.

Figure 1

Locations of Air Quality and Noise Monitoring Stations

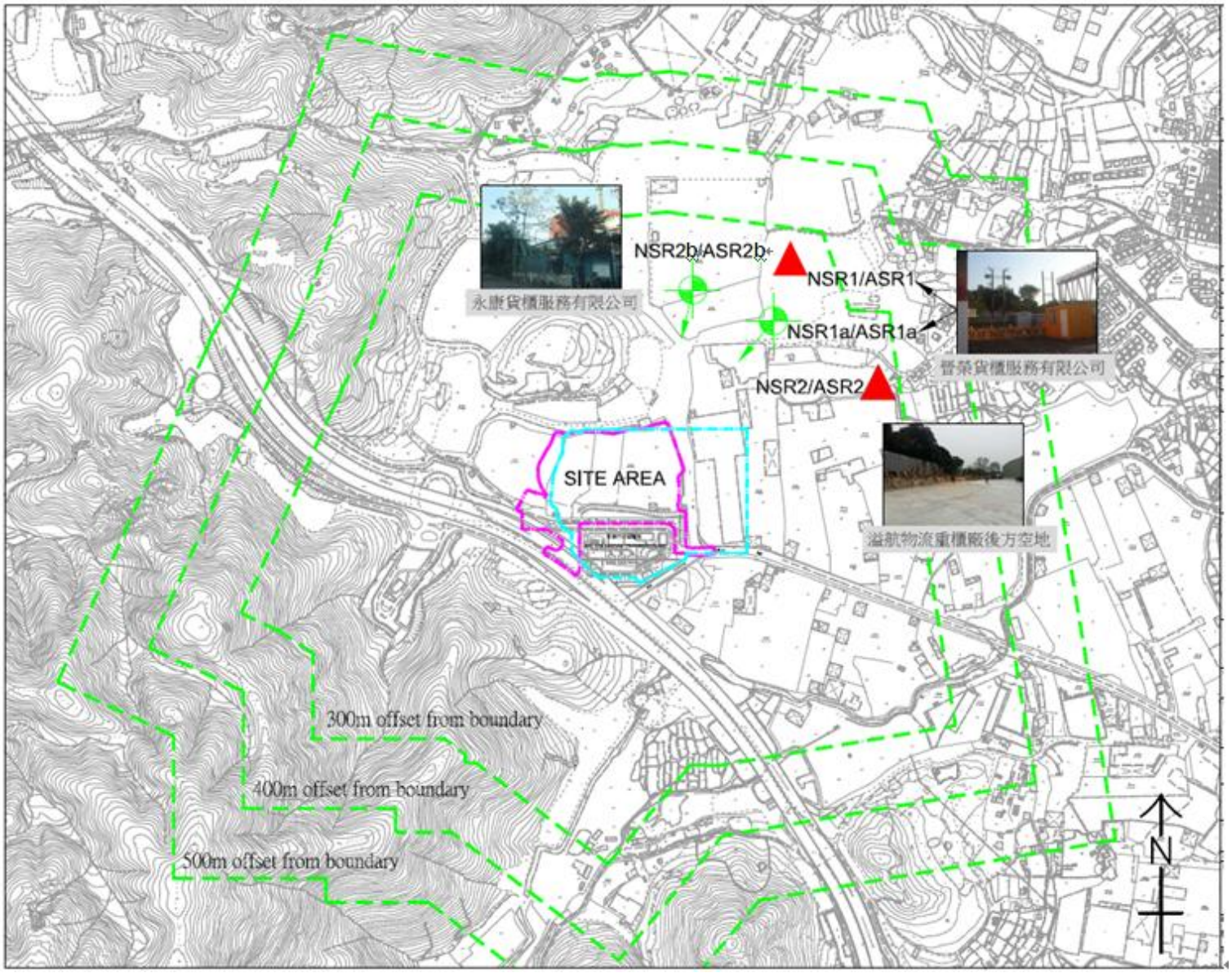


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Figure 1 Locations of Air Quality and Noise Monitoring Stations

Figure 2

Locations of Water Quality Monitoring Station

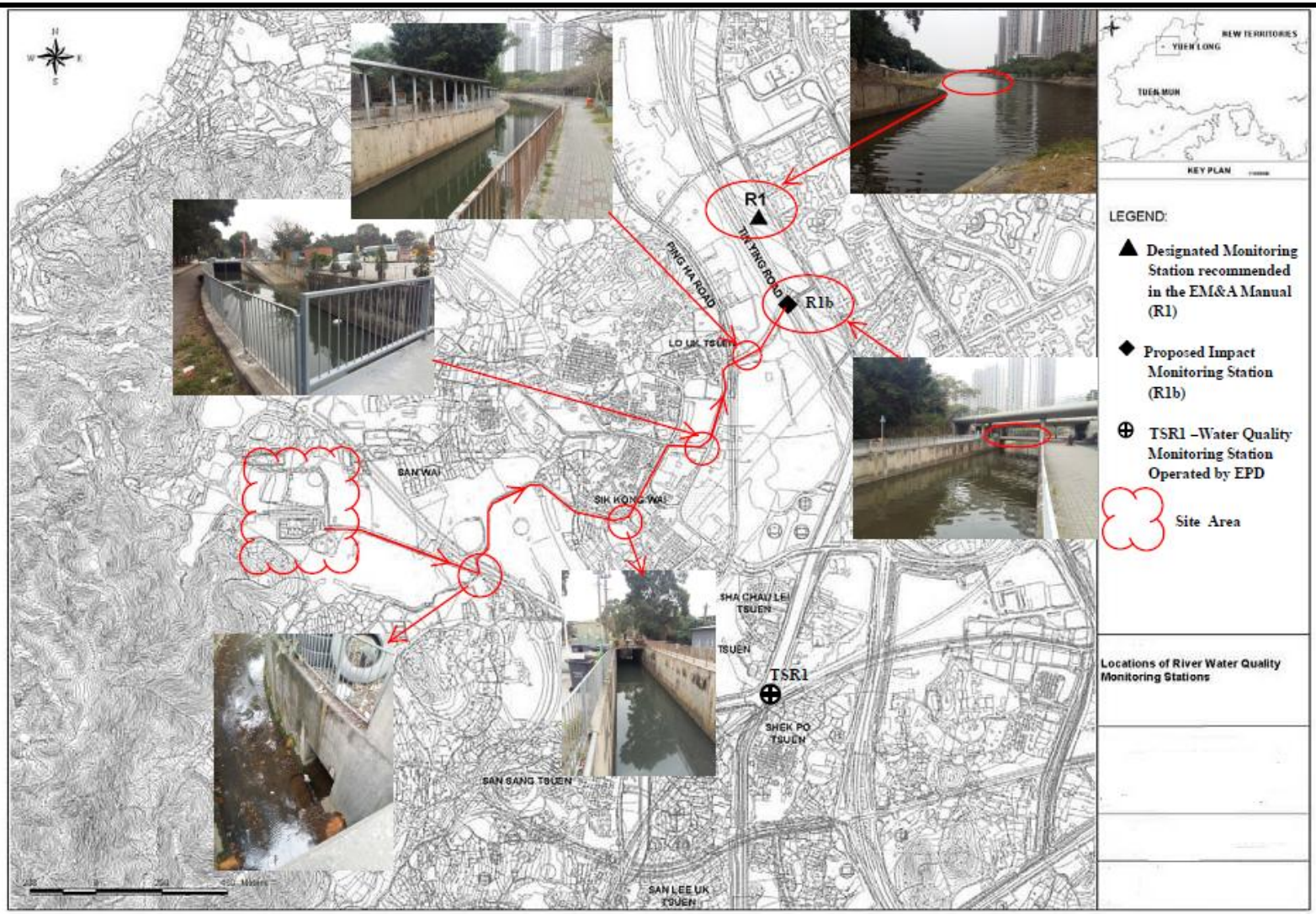

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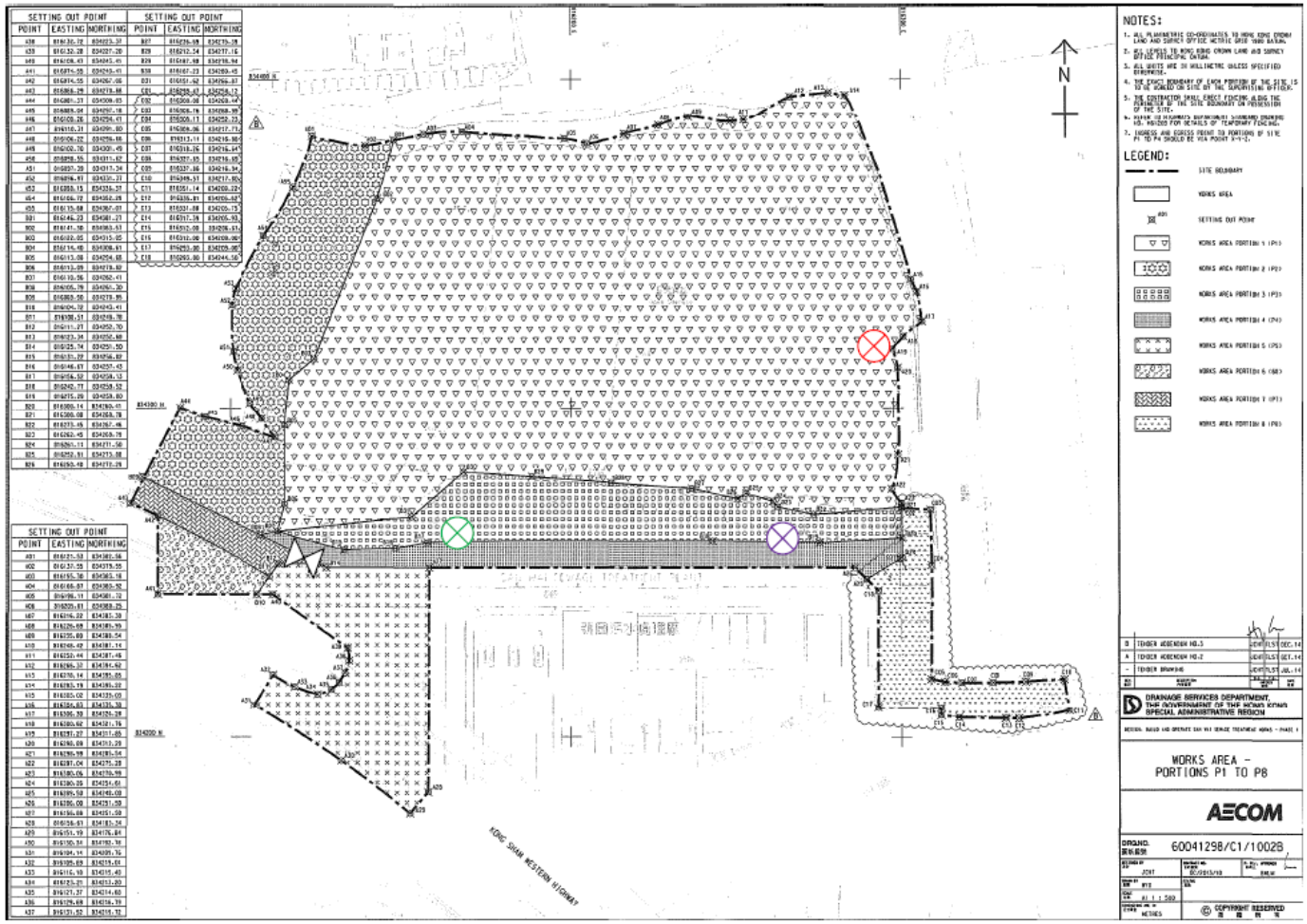
Figure 2 Locations of Water Quality Monitoring Station

Figure 3

Location Plan for the Wetsep Treatment Tank



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

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Figure 3 Location Plan for the Wetsep Treatment Tank