


Jardine Engineering Corporation Limited

Contract No. DE/2009/09
Supply and Installation of Electrical and
Mechanical Equipment for Tai Po Sewage
Treatment Works Stage 5 Phase 2B

Quarterly Environmental Monitoring and Audit Report (July to September 2013)

(Version 1.0)

Certified By 
(Environmental Team Leader)

REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 9th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for DSD Contract no. DE/2009/09 “Supply and Installation of Electrical and Mechanical Equipment for Tai Po Sewage Treatment Works Stage 5 Phase 2B”. This summary report presents EM&A works performed in the period between July and September 2013.
2. The construction activities undertaken in the reporting quarter include:
 - Remedial work for defects of Final Clarifier No. 11B & 12B after completion of testing and commissioning;
 - Installation of E&M equipment in Aeration Tank No. 5, 6 & 7;
 - E&M installation of Primary Sedimentation Tank No. 5;
 - E&M installation of new Air Blower No.5;
 - Demolition of existing Air Blower No.2;
 - Fabrication of bio-gas holder on site;
 - Installation of new screw pumps (for Stage IV Inlet Works);
 - E&M installation for new Gas Transfer Station;
 - BS & FS installation in new Chemical and Oil Store; and
 - Electrical load diversion work for replacement of existing MCC1 at 1/F Switchroom of Inlet Works;
 - Removal of existing RAS Pump No.4 and associated pipework at Stage IV RAS Pumping Station;
 - RAS pipework installation at Pipe Gallery for new Aeration Tanks No.5 to 7;
 - Pipework installation at Pipe Gallery for new PST No.5;
 - Relocation of remaining 2 nos. existing MLR Pump Control Panels & 3 nos. Foam Pump Panels from Aeration Tank Control Kiosk to Chemical House;
 - Electrical load diversion work for replacement of existing MCC5 at Stage IV PST Pipe Gallery;
 - Installation of new E&M equipment at Filtrate Treatment Plant (SBR);
 - Removal of existing MCCs from G/F and 1/F Switchroom of Stage IV Inlet Works after load diversion work;
 - BS & FS installation in new Gas Transfer Station;
 - E&M installation of FC No.8B and 10B;
 - Demolition of existing cooling water system at CBC; and
 - E&M installation for new Sludge Digestion Tank No.3

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
4. Summary of the events and action taken in the reporting quarter is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Quarter

Parameter	No. of Exceedance		No. of Events due to this Project	Action Taken
	Action Level	Limit Level		
1-hour TSP	0	0	0	N/A
24-hour TSP	0	0	0	N/A
Noise	0	0	0	N/A

Construction Noise

5. All construction noise monitoring was conducted as scheduled in the reporting quarter. No Action Level (public complaint) / Limit Level exceedance was recorded in the reporting quarter.

Air Quality

6. The air quality monitoring was conducted as scheduled in this reporting period. No Action/Limit Level exceedance was recorded in the reporting period.

Environmental Complaint and Prosecution

7. No environmental complaint, prosecution or notification of summons was received in this reporting quarter.

Environmental Licensing and Permitting

8. Environmental related licenses/permits granted to the Project include the Environmental Permit (EP) for the Project and Registration of Chemical Waste Producer.

Future Key Issues

9. The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain and the noise nuisance from the major construction activities will be undertaken in the coming quarter, including:
- E&M installation of FC No.8B and 10B;
 - Installation of E&M equipment in Aeration Tank No. 5, 6 & 7;
 - RAS pipework installation at Pipe Gallery for new Aeration Tanks No.5 to 7;
 - E&M installation of Primary Sedimentation Tank No. 5;
 - Pipework installation at Pipe Gallery for new PST No.5;
 - E&M installation of new Air Blower No.5;
 - Installation of MCC5 at Stage IV PST Pipe Galley;
 - Demolition of existing cooling water system at CBC;
 - Installation of mechanical screen and shaftless conveyor at Stage IV Screening House;
 - Fabrication of bio-gas holder on site;
 - Installation of new E&M equipment at Filtrate Treatment Plant (SBR);
 - Installation of new screw pumps (for Stage IV Inlet Works);
 - E&M installation for new Sludge Digestion Tank No.3;
 - Installation of MCC at CBC G/F Switchroom; and
 - Installation of MCC1 at CBC 1/F Switchroom.

1. INTRODUCTION

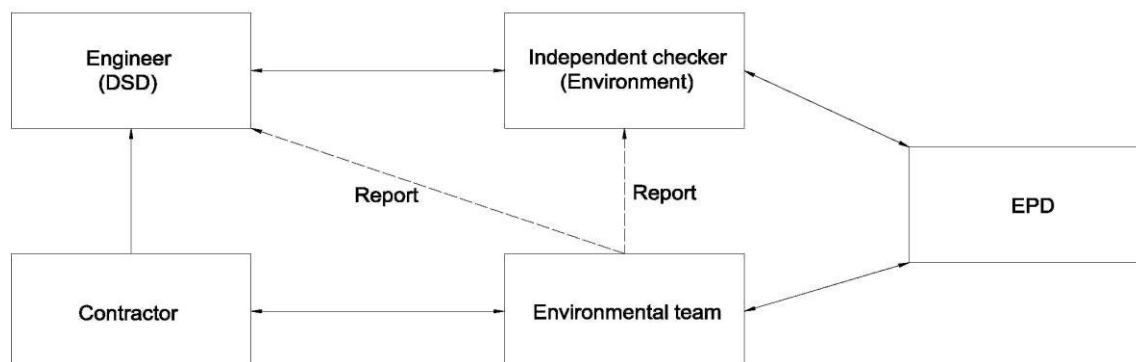
Background

- 1.1 Tai Po Sewage Treatment Works (TPSTW) is located within the Tai Po Industrial Estate. It currently comprises four Stages: I, II, IVA and IVB works. The TPSTW - Stage V aims to upgrade the existing STW to provide additional sewage treatment capacity from the present design flow of 88,000 m³/day to 130,000 m³/day to meet the demands of both the existing and future developments, and to meet the revised discharge license requirements.
- 1.2 The TPSTW Stage V, Phase I and Phase II are Designated Projects under the Environmental Impact Assessment Ordinance (Cap. 449) with the same EIAO Register No. AEIAR – 081/2004. A study of environmental impact assessment (EIA) was undertaken to evaluate various environmental impacts associated with the works within these two Designed Projects. An EIA Report as well as an Environmental Monitoring and Audit (EM&A) Manual were approved by the Environmental Protection Department (EPD) on 28 October 2004.
- 1.3 The Stage V works will be implemented in 2 phases. The design capacities of Phase I and Phase II works are 100,000 m³/day and 130,000 m³/day respectively. An Environmental Permit (EP) No. EP-265/2007 was issued on 22 March 2007 for the TPSTW Stage V Phase II to the Drainage Services Department (DSD) as the Permit Holder. The project “Tai Po Sewage Treatment Works – Stage V Phase IIB” formed part of the Phase II works, includes additional secondary treatment process units (1 primary clarifier; 3 bioreactors and 2 final clarifiers) in TPSTW for its future extended plant design capacity of 120,000 m³/day. A master construction programme of the Project is provided in **Appendix M**. A site layout plan is provided in **Figure 1.1**. The construction activities of the Project commenced on 16 May 2011.
- 1.4 Cinotech Consultants Ltd. was commissioned by the Contractor as the Environmental Team (ET) to undertake the EM&A works for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the EP. Ove Arup and Partners Hong Kong Limited. was appointed as the IEC under Condition 2.2 of the EP. This is the 9th quarterly EM&A summary report summarizing the EM&A works for the Project between July and September 2013.

Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
- Project Proponent / Engineer’s Representative (ER) – Drainage Services Department
 - Environmental Team (ET) – Cinotech Consultants Ltd.
 - Independent Environmental Checker (IEC) – Ove Arup and Partners Hong Kong Limited
 - Contractor –Jardine Engineering Corporation Ltd.
- 1.6 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.7 The Project Organization during Construction Phase

1.8 The key contacts of the Project are shown in **Table 1.1**.**Table 1.1 Key Project Contacts**

Party	Role	Name	Position	Phone No.	Fax No.
DSD	E&M Branch	Mr. TONG Sau Kit	Senior Engineer	2594 7304	2827 8532
		Mr. TSE Ho	Engineer	2660 7638	
Cinotech	Environmental Team	Dr. Priscilla CHOY	ET Leader	2151 2089	3107 1388
		Mr. Kevin LAM	Project Coordinator and Audit Team Leader	2151 2035	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Arup	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2865 6493
		Mr. Ken LEE	Assistant to Independent Environmental Checker	2268 3573	
JEC	E&M Contractor	Mr. Alex Law	Project Manager	9312 8659	2887 9090
		Mr. Kim Hung LAU	Site Agent	6393 7548	
		Mr. Brendan Chan	Environmental Officer	6393 2904	

Construction Programme and Synopsis of Work

1.9 The construction programme is presented in **Appendix A**. The site activities undertaken during the reporting quarter included:

- Remedial work for defects of Final Clarifier No. 11B & 12B after completion of testing and commissioning;
- Installation of E&M equipment in Aeration Tank No. 5, 6 & 7;
- E&M installation of Primary Sedimentation Tank No. 5;
- E&M installation of new Air Blower No.5;
- Demolition of existing Air Blower No.2;
- Fabrication of bio-gas holder on site;
- Installation of new screw pumps (for Stage IV Inlet Works);
- E&M installation for new Gas Transfer Station;
- BS & FS installation in new Chemical and Oil Store; and
- Electrical load diversion work for replacement of existing MCC1 at 1/F Switchroom of Inlet Works;
- Removal of existing RAS Pump No.4 and associated pipework at Stage IV RAS Pumping Station;

- RAS pipework installation at Pipe Gallery for new Aeration Tanks No.5 to 7;
- Pipework installation at Pipe Gallery for new PST No.5;
- Relocation of remaining 2 nos. existing MLR Pump Control Panels & 3 nos. Foam Pump Panels from Aeration Tank Control Kiosk to Chemical House;
- Electrical load diversion work for replacement of existing MCC5 at Stage IV PST Pipe Gallery;
- Installation of new E&M equipment at Filtrate Treatment Plant (SBR);
- Removal of existing MCCs from G/F and 1/F Switchroom of Stage IV Inlet Works after load diversion work;
- BS & FS installation in new Gas Transfer Station;
- E&M installation of FC No.8B and 10B;
- Demolition of existing cooling water system at CBC; and
- E&M installation for new Sludge Digestion Tank No.3

Summary of EM&A Requirements

- 1.10 The EM&A programme requires construction phase air quality, noise monitoring and landfill gas monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:
- All monitoring parameters;
 - Action and Limit levels for all environmental parameters;
 - Event / Action Plans;
 - Environmental mitigation measures, as recommended in the project EIA study final report; and
 - Environmental requirements in contract documents.
- 1.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 4 of this report.
- 1.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality and noise as well as audit works for the Project in the reporting period.

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

- 2.1 The EM&A Manual designate locations for the ET to monitor environmental impacts in terms of noise and air quality due to the Project. The Project area and monitoring locations are depicted in **Figure 1.2**. **Appendix B** gives details of monitoring requirements.
- 2.2 In accordance with clause 8.8 of the EM&A Manual, the number and location of the monitoring stations and parameters can be referred to Monthly EM&A reports in order to cater for any changes in the surrounding environmental and the nature of works in progress. In this reporting period, there is no alteration made on changing the location of the monitoring stations.

Monitoring Methodology and Calibration Details

- 2.3 Monitoring works/equipments were conducted/calibrated regularly in compliance with the EM&A Manual's requirements. Monitoring methodologies and calibration details can be referred to Monthly EM&A reports. Valid calibration certificates were attached in the appendices of the relevant Monthly EM&A reports.

Environmental Quality Performance Limits (Action and Limit Levels)

- 2.4 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix C**.

Environmental Mitigation Measures

- 2.5 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manual for the Contractor to implement. A summary of the Updated Environmental Mitigation Implementation Schedule (EMIS) is given in **Appendix H**.

3. MONITORING RESULTS

Weather Conditions

- 3.1 The weather during monitoring sessions was mainly sunny or cloudy. The weather conditions for each individual monitoring session were presented in corresponding of Monthly EM&A Reports.

Air Quality

- 3.2 Air quality monitoring was conducted as scheduled in the reporting period.
- 3.3 Graphical presentations of 1-hour TSP and 24-hour TSP monitoring results are shown in **Appendices D** and **E**, respectively.
- 3.4 All measured 1-hour and 24-hour TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.

Construction Noise

- 3.5 All construction noise monitoring was conducted as scheduled in the reporting period.
- 3.6 Graphical representations of the monitoring results are shown in **Appendix F**. No Action Level (public complaint) / Limit Level exceedance was recorded in the reporting period.

4. AUDIT RESULTS

Implementation Status of Environmental Mitigation Measures

- 4.1 The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.

Site Audit Summary

- 4.2 During site inspections in the reporting period, no non-conformance was identified. The observations and recommendations made in each site audit session in the reporting period are summarized in **Table 4.1**.

Table 4.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	25 June 2013	<u>Reminder:</u> Rain water near JEC site should be cleared to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 4 July 2013.
	4 July 2013	<u>Reminder:</u> Rain water at FC12 should be cleared regularly.	The identified observation was observed improved/rectified by the Contractor during the audit session on 12 July 2013.
Air Quality	N/A	N/A	N/A
Noise	N/A	N/A	N/A
Waste / Chemical Management	4 July 2013	<u>Reminder:</u> Construction materials should be fenced off.	The identified observation was observed improved/rectified by the Contractor during the audit session on 12 July 2013.
	17 July 2013	<u>Reminder:</u> Construction materials near JEC site office should be cleared.	The identified observation was observed improved/rectified by the Contractor during the audit session on 30 July 2013.
	9 August 2013	<u>Reminder:</u> Clear the general refuse outside the JEC site office to avoid accumulation.	The identified observation was observed improved/rectified by the Contractor during the audit session on 16 August 2013.
	23 August 2013	<u>Reminder:</u> Properly clear the general refuse outside JEC site office.	The identified observation was observed improved/rectified by the Contractor during the audit session on 27 August 2013.
	5 September 2013	<u>Reminder:</u> Properly clear the construction materials near JEC site office.	The identified observation was observed improved/rectified by the Contractor during the audit session on 13 September 2013.
	13 September 2013	<u>Reminder:</u> Provide sorting for the waste storage in the temporary waste storage area to sort out general refuse from construction waste.	The identified observation was observed improved/rectified by the Contractor during the audit session on 18 September 2013.

Parameters	Date	Observations and Recommendations	Follow-up
	18 September 2013	<u>Reminder:</u> Clear the construction material in the sorting area to keep the area tidy.	The identified observation was observed improved/rectified by the Contractor during the audit session on 24 September 2013.
Permit/Licenses	N/A	N/A	N/A

Status of Environmental Licensing and Permitting

- 4.3 Environmental licenses and permits including the Environmental Permit (EP) and Registration of Chemical Waste Producer were in place and valid during the reporting quarter. A summary of environmental licensing and permit status is given in **Appendix I**.

Advice on Waste Management Status

- 4.4 No inert C&D waste was disposed in the reporting period. 11.4 tonnes of general refuse was disposed in the reporting period. 600 L of chemical waste was generated in the reporting period. The amount of wastes generated by the activities of the Project in the reporting period fulfills the requirement of estimated volume of excavated material in EIA Report. The amount of wastes generated by the activities of the Project in the reporting period was attached in the appendices of the Monthly Reports for July to September 2013. Waste flow table please refer to **Appendix J**.

5. NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances

- 5.1 Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. A summary of exceedance is attached in **Appendix K**.
- 5.2 All measured 1-hour and 24-hour TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting period.
- 5.3 No Action/Limit Level exceedance for the construction noise was recorded in the reporting period.

Review of the Reasons for and the Implications of Non-compliance

- 5.4 There was no non-compliance from the site audits in the reporting quarter. The observations and recommendations made in each audit session were attached in the Monthly Reports.

6. ENVIRONMENTAL COMPLAINTS AND PROSECUTIONS

- 6.1 No environmental related complaint, prosecution or notification of summons was received in the reporting quarter.

7. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

- 7.1 Environmental monitoring and audit works were performed in the reporting quarter. The EM&A program was strictly following the requirement of methodology in EM&A manual. The monitoring work was considered as effective. In addition, site inspections were conducted on a weekly basis. The results were reviewed and checked.

Effectiveness of Mitigation Measures

- 7.2 The mitigation measures recommended in the EIA report and required by the EP are considered effective in minimizing environmental impacts. The Contractor has implemented the recommended mitigation measures except those mitigation measures not applicable at this stage.

Conclusion

- 7.3 All measured 1-hour and 24-hour TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.4 All measured noise levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.5 There was no environmental complaint, prosecution or notification of summons received.
- 7.6 The anticipated environmental impacts will be mainly on dust emission and accumulation of waste construction materials. The major construction activities will be undertaken in the coming quarter, including:
- E&M installation of FC No.8B and 10B;
 - Installation of E&M equipment in Aeration Tank No. 5, 6 & 7;
 - RAS pipework installation at Pipe Gallery for new Aeration Tanks No.5 to 7;
 - E&M installation of Primary Sedimentation Tank No. 5;
 - Pipework installation at Pipe Gallery for new PST No.5;
 - E&M installation of new Air Blower No.5;
 - Installation of MCC5 at Stage IV PST Pipe Galley;
 - Demolition of existing cooling water system at CBC;
 - Installation of mechanical screen and shaftless conveyor at Stage IV Screening House;
 - Fabrication of bio-gas holder on site;
 - Installation of new E&M equipment at Filtrate Treatment Plant (SBR);
 - Installation of new screw pumps (for Stage IV Inlet Works);
 - E&M installation for new Sludge Digestion Tank No.3;
 - Installation of MCC at CBC G/F Switchroom; and
 - Installation of MCC1 at CBC 1/F Switchroom.

Recommendations

- 7.7 According to the environmental audit sessions performed in the reporting period, the following recommendations were made:

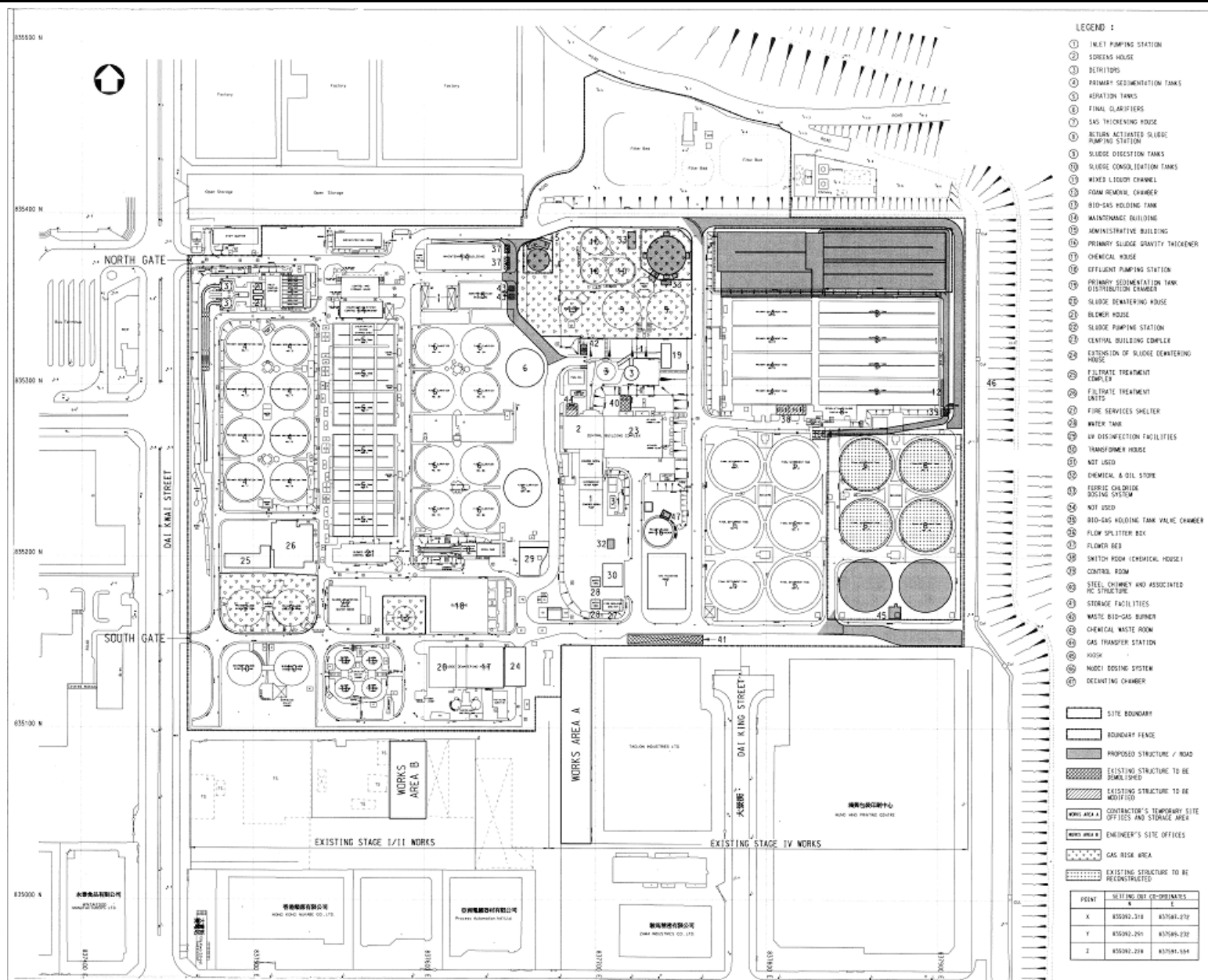
Water Impact

- Clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment.
- Apply good site practice to prevent accumulation of stagnant water after rainstorm.

Waste / Chemical Management

- Good site practices should be adopted to check for any accumulation of waste materials on site and dispose waste materials at designated areas.
- Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.

FIGURES



- LEGEND :**
- ① INLET PUMPING STATION
 - ② SCREENS HOUSE
 - ③ DETRIATORS
 - ④ PRIMARY SEDIMENTATION TANKS
 - ⑤ AERATION TANKS
 - ⑥ FINAL CLARIFIERS
 - ⑦ GAS THICKENING HOUSE
 - ⑧ RETURN ACTIVATED SLUDGE PUMPING STATION
 - ⑨ SLUDGE DISSOLUTION TANKS
 - ⑩ SLUDGE CONSOLIDATION TANKS
 - ⑪ MIXED LIQUOR CHANNEL
 - ⑫ FOAM REMOVER CHANNEL
 - ⑬ BIOD-GAS HOLDING TANK
 - ⑭ MAINTENANCE BUILDING
 - ⑮ ADMINISTRATIVE BUILDING
 - ⑯ PRIMARY SLUDGE GRAVITY THICKENER
 - ⑰ CHEMICAL HOUSE
 - ⑱ EFFLUENT PUMPING STATION
 - ⑲ PRIMARY SEDIMENTATION TANK DISTRIBUTION CHANNEL
 - ⑳ SLUDGE DEWATERING HOUSE
 - ㉑ BLOWER HOUSE
 - ㉒ SLUDGE PUMPING STATION
 - ㉓ CENTRAL BUILDING COMPLEX
 - ㉔ EXTENSION OF SLUDGE DEWATERING HOUSE
 - ㉕ FILTRATE TREATMENT CENTER
 - ㉖ FILTRATE TREATMENT UNITS
 - ㉗ FIRE SERVICES SHELTER
 - ㉘ WATER TANK
 - ㉙ UV DISINFECTION FACILITIES
 - ㉚ TRANSFORMER HOUSE
 - ㉛ NOT USED
 - ㉜ CHEMICAL & OIL STORE
 - ㉝ FERRIC CHLORIDE DOSING SYSTEM
 - ㉞ NOT USED
 - ㉟ BIOD-GAS HOLDING TANK VALVE CHAMBER
 - ⓫ FLOW SPLITTER BOX
 - ⓬ FLOWMETER
 - ⓭ SWITCH ROOM (CHEMICAL HOUSE)
 - ⓮ CONTROL ROOM
 - ⓯ SITE, CHIMNEY AND ASSOCIATED PG STRUCTURE
 - ⓰ STORAGE FACILITIES
 - ⓱ WASTE BIOD-GAS BURNER
 - ⓲ CHEMICAL WASTE ROOM
 - ⓳ GAS TRANSFER STATION
 - ⓴ ROOF
 - ⓵ MUDDI DRESSING SYSTEM
 - ⓶ DEWATERING CHAMBER
- ▭ SITE BOUNDARY
 - ▭ BOUNDARY FENCE
 - ▭ PROPOSED STRUCTURE / ROAD
 - ▭ EXISTING STRUCTURE TO BE DEMOLISHED
 - ▭ EXISTING STRUCTURE TO BE MODIFIED
 - ▭ CONTRACTOR'S TEMPORARY SITE OFFICES AND STORAGE AREA
 - ▭ ENGINEER'S SITE OFFICES
 - ▭ GAS RISE AREA
 - ▭ EXISTING STRUCTURE TO BE RECONSTRUCTED
- | POINT | SPLITTING POINT CO-ORDINATES | |
|-------|------------------------------|------------|
| | X | Y |
| 1 | 835042.218 | 837047.272 |
| 2 | 835042.265 | 837049.232 |
| 3 | 835042.218 | 837047.504 |

TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

PROJECT SITE LAYOUT PLAN

Scale

N.T.S

Proposa

No.

MA10069

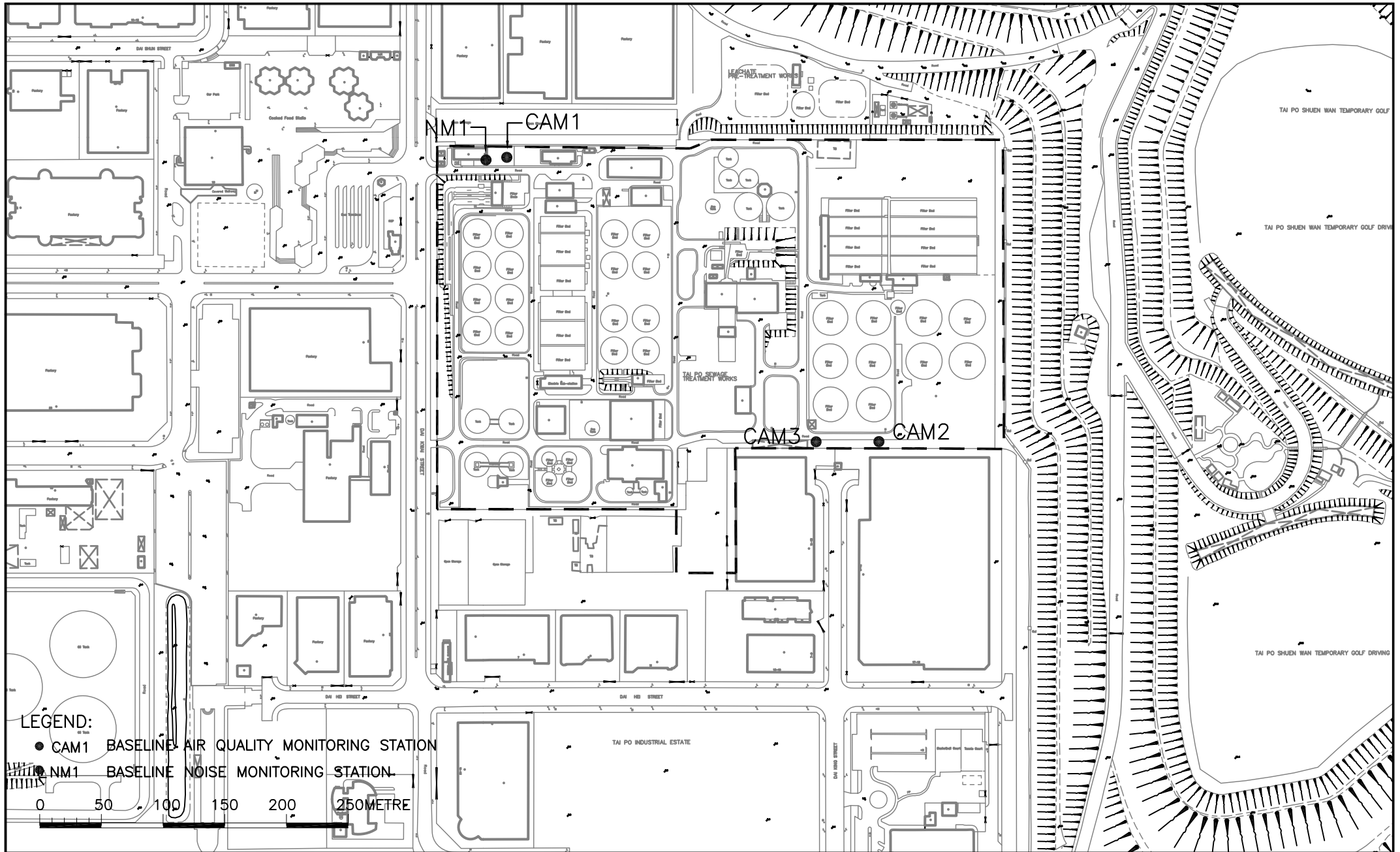
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Figure

1.1

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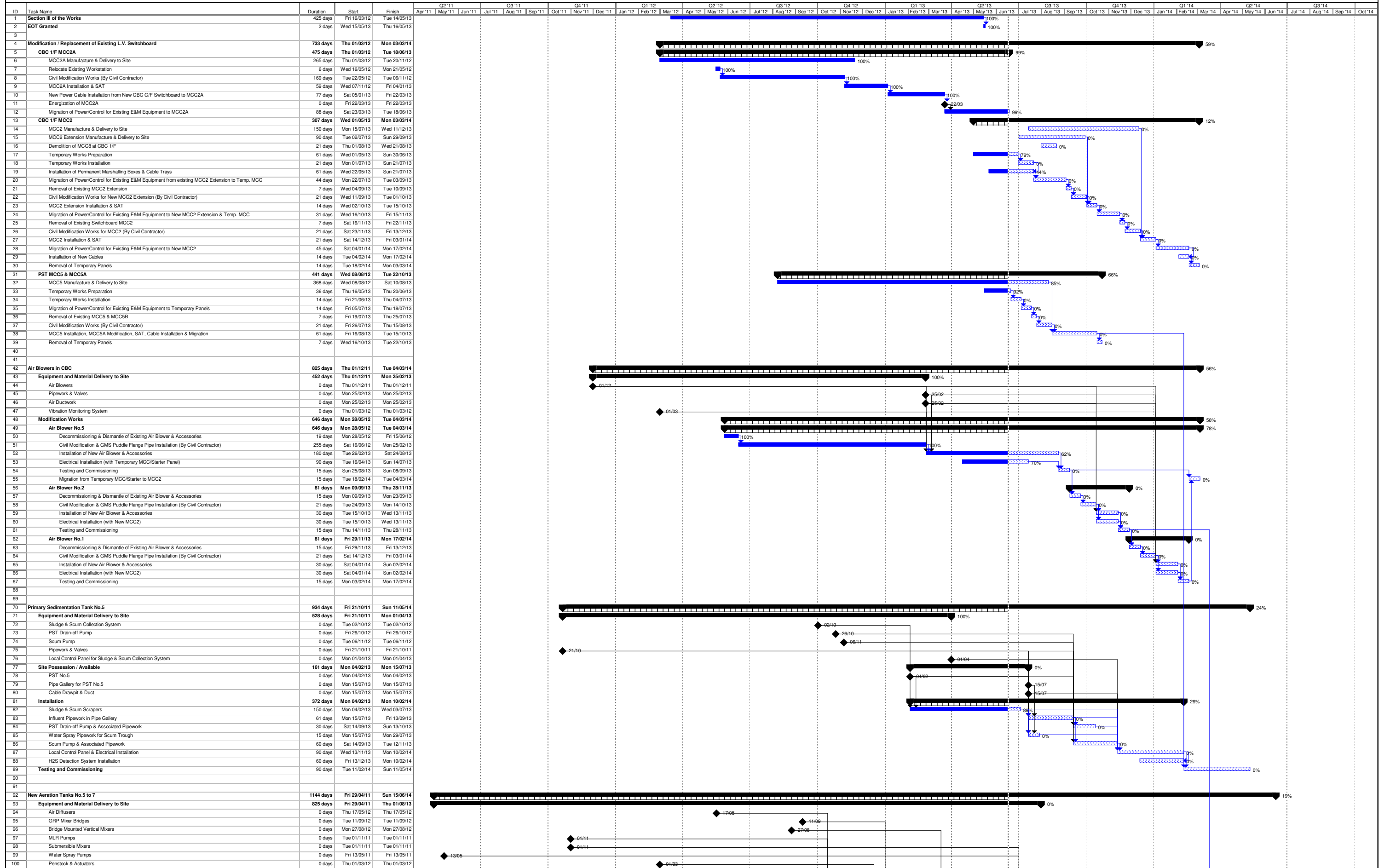


Tai Po Sewage Treatment Work, Stage V, Phase IIB
LOCATIONS OF AIR QUALITY AND NOISE MONITORING STATIONS

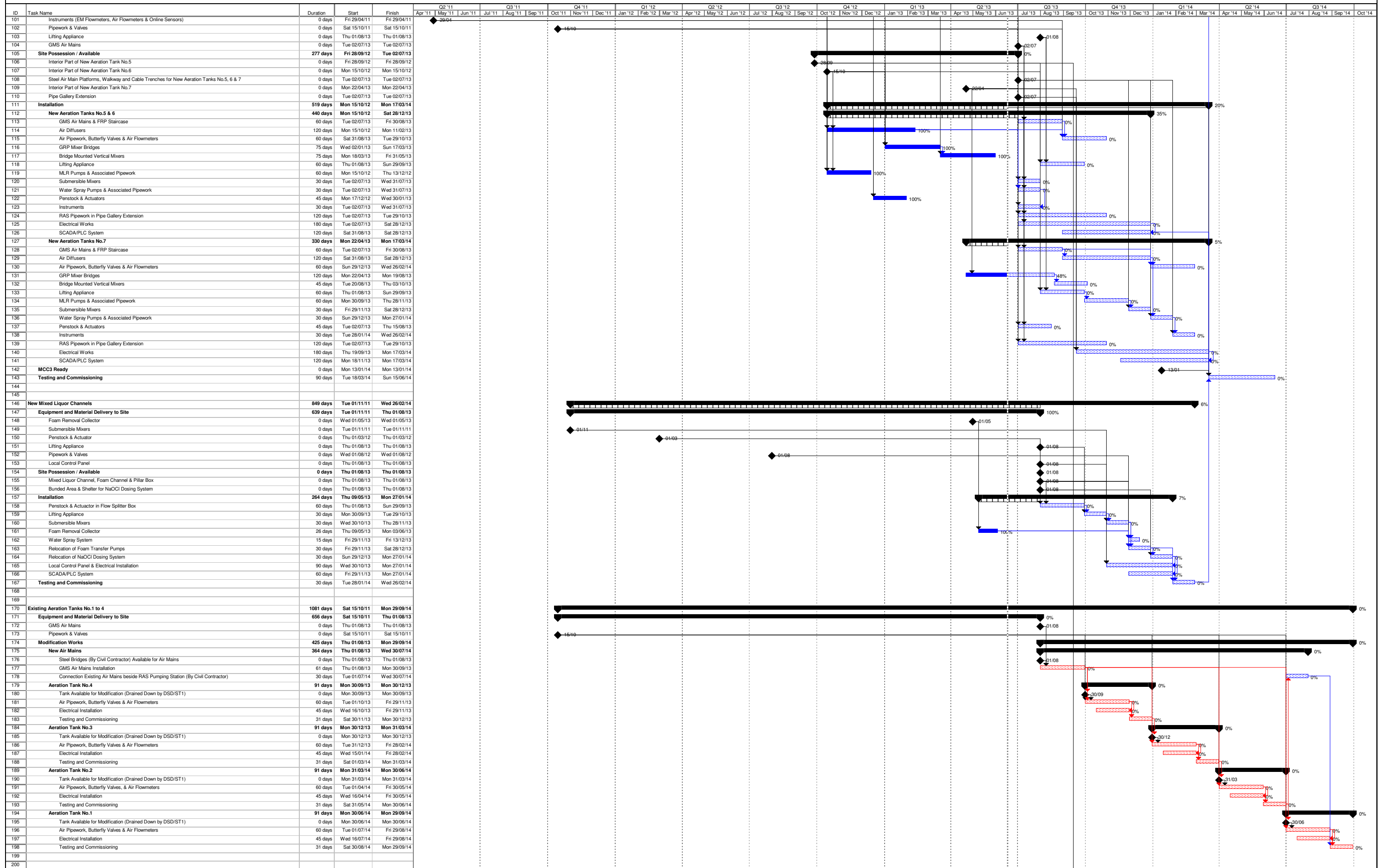
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**APPENDIX A
CONSTRUCTION PROGRAMME**

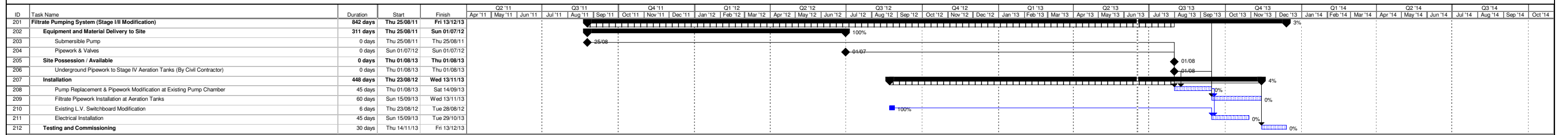
Section III Works Programme



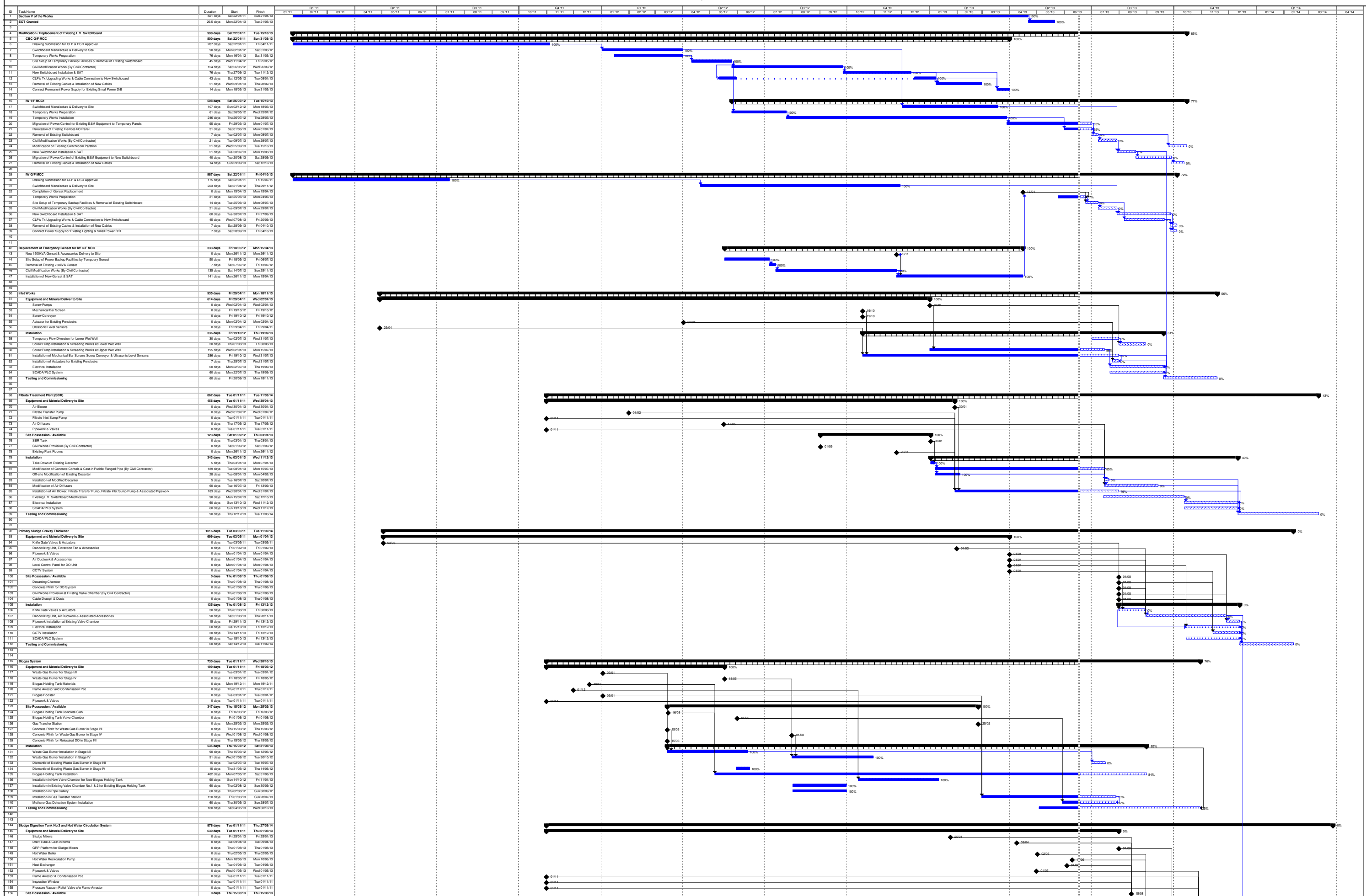
Section III Works Programme



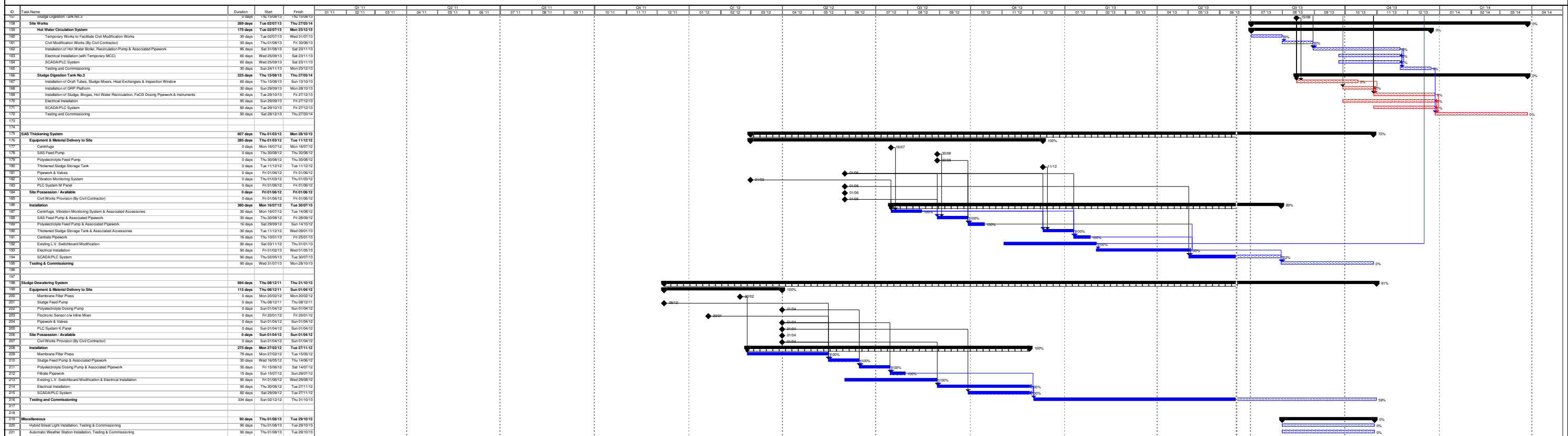
Section III Works Programme



Section V Works Programme



Section V Works Programme



**APPENDIX B
MONITORING REQUIREMENTS**

APPENDIX B – MONITORING REQUIREMENTS

Type of Monitoring	Parameter	Frequency	Duration	Location of Measurement
Noise ⁽¹⁾	L _{eq} (30 min.) (0700-1900 hrs. on normal weekdays)	Once per week	30 mins	<ul style="list-style-type: none"> NM1 (Outside the corridor of 1/F of Government Staff Quarter)
Air	1-hour TSP	3 times every six days	1 hour	<ul style="list-style-type: none"> CAM1 (on flat roof of Government Staff Quarters)
	24-hour TSP	Once every six days	24 hours	<ul style="list-style-type: none"> CAM2 (on ground within TPSTW and just next to the Printing Centre of Hung Hing Printing Centre) CAM3 (on ground within TPSTW and just next to Talcon Industrial Ltd.)

(1) If construction works are extended to include works during the hours of 1900 – 0700, additional weekly impact monitoring shall be carried out during evening and night-time works.

APPENDIX C
ACTION AND LIMIT LEVELS

APPENDIX C – Action and Limit Levels**1-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	315	500
CAM2	336	
CAM3	344	

24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	171	260
CAM2	177	
CAM3	192	

Construction Noise

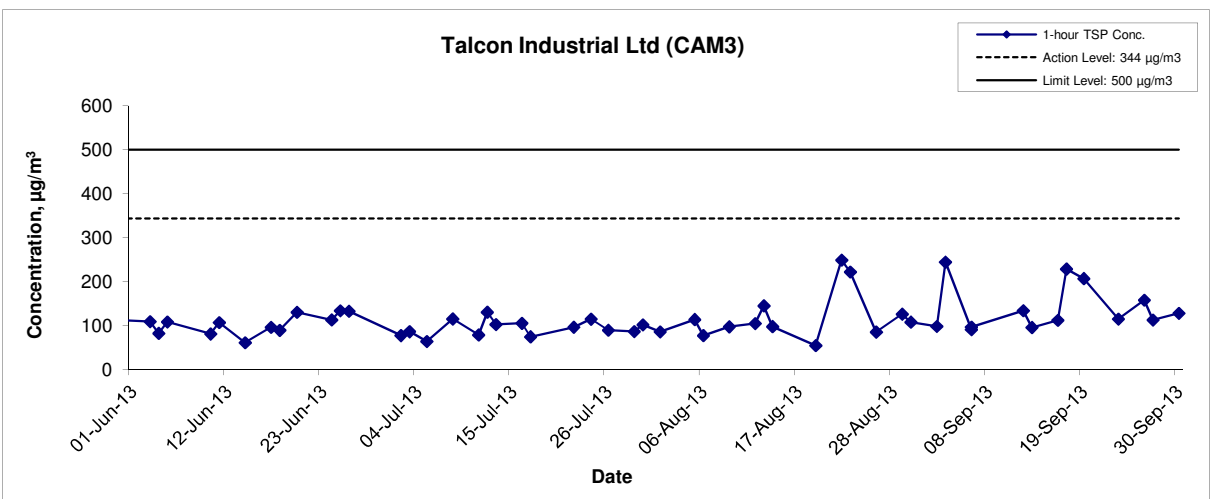
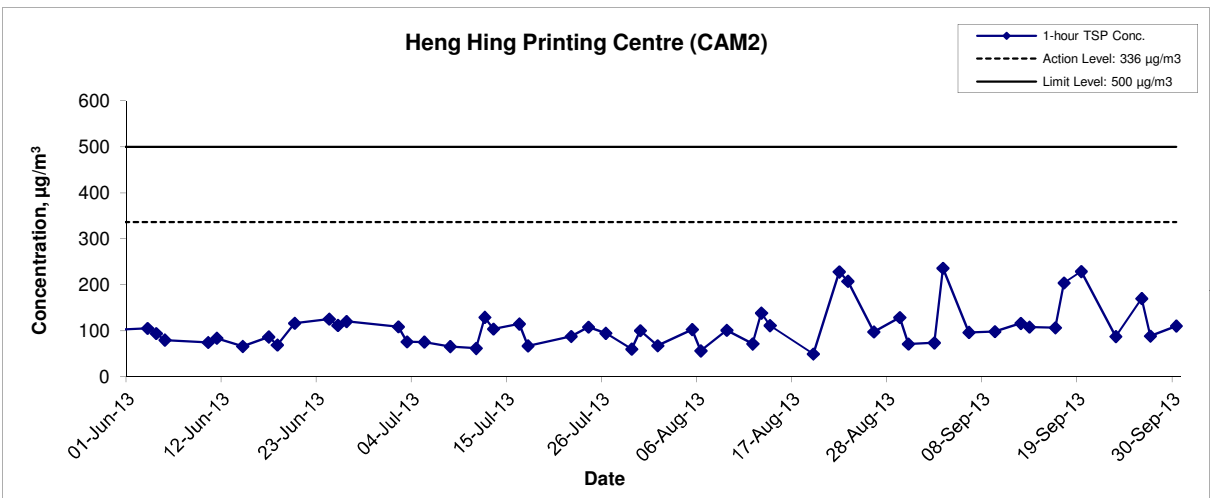
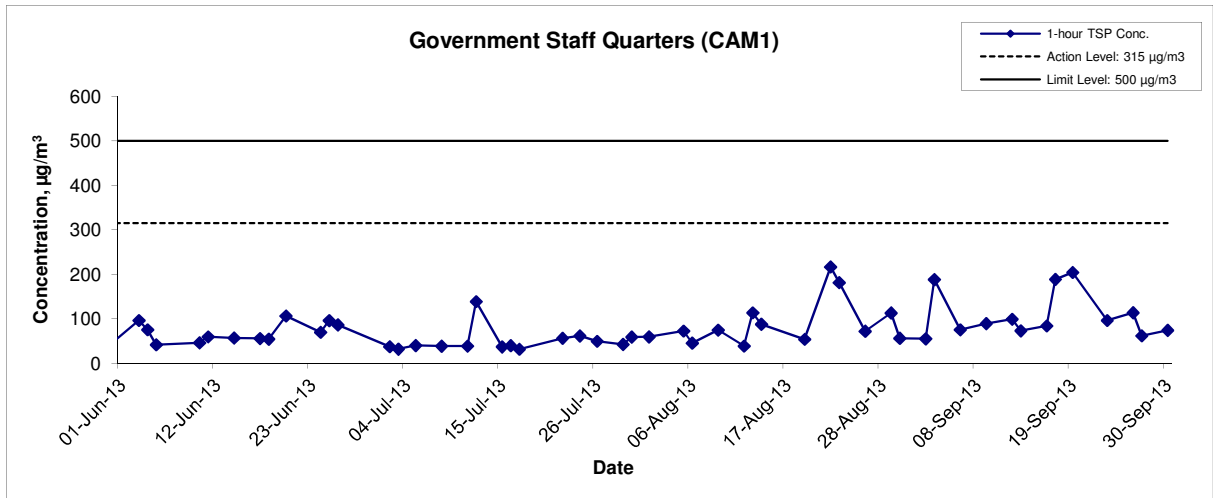
Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days		70* dB(A)
2300-0700 hrs of next day		55* dB(A)

Notes:

* The Area Sensitivity Rating for Station NM1 is taken as C, due to the nearby industrial area, according to Table 1 of EPD's Technical Memorandum on Noise from Construction Work other than Percussive Piling.

**APPENDIX D
GRAPHICAL PRESENTATION OF 1-
HOUR TSP MONITORING RESULTS**

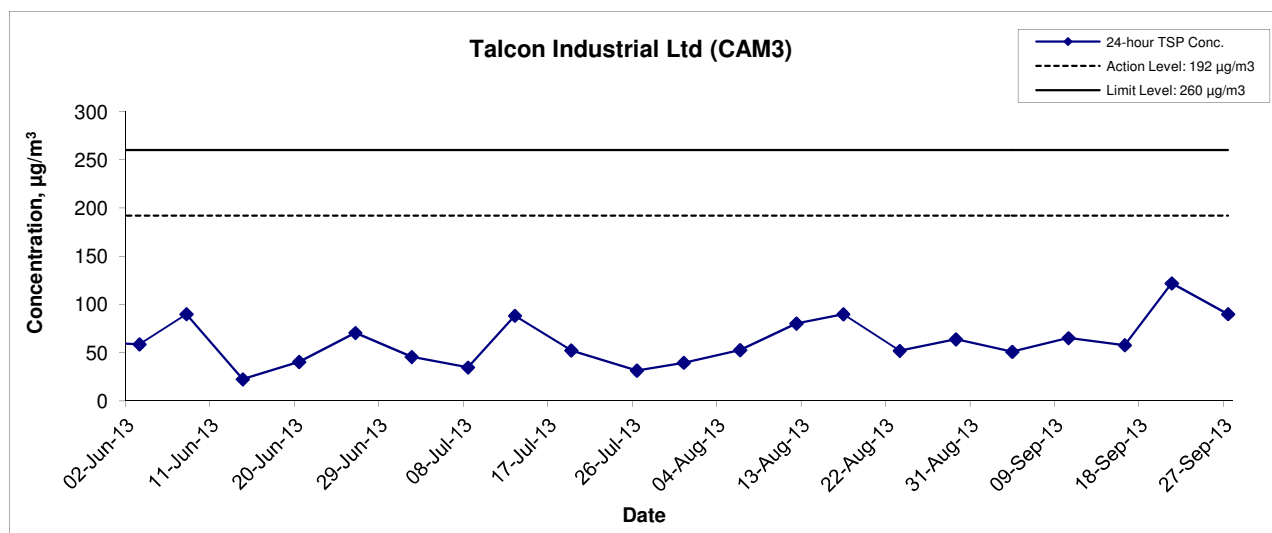
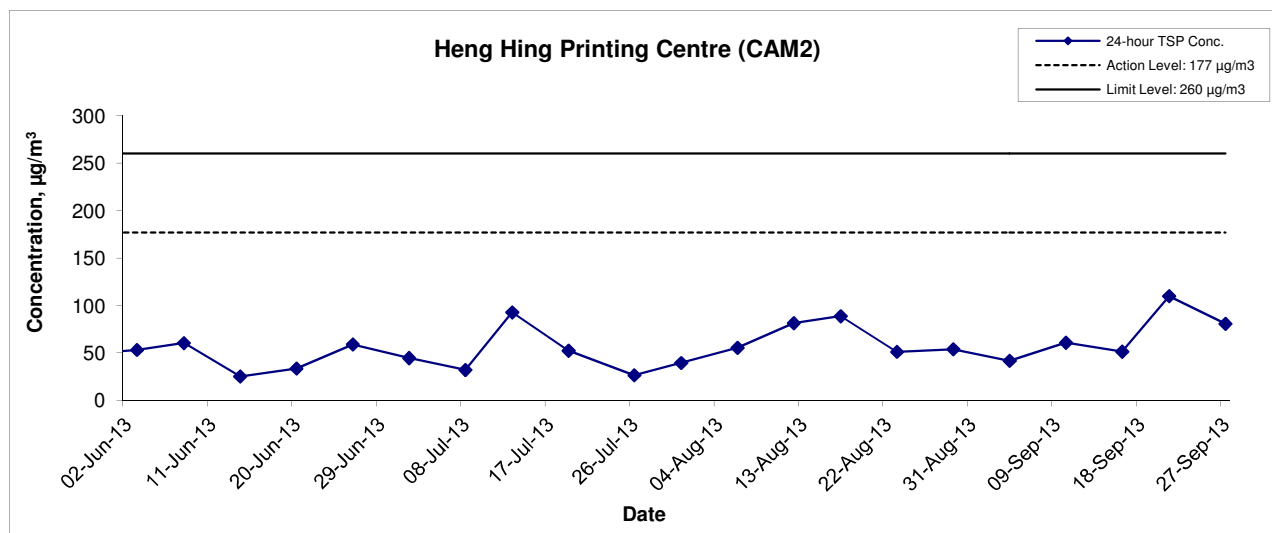
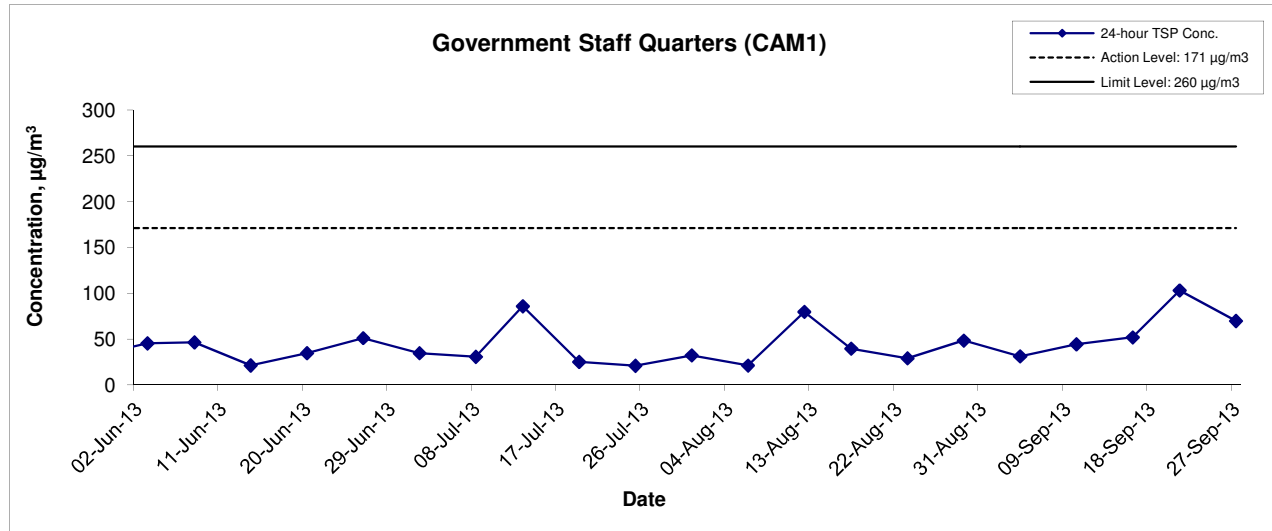
1-hr TSP Concentration Levels



Title Contract No. DE/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of 1-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA10069	
	Date Sep 13	Appendix D	

**APPENDIX E
GRAPHICAL PRESENTATION OF 24-
HOUR TSP MONITORING RESULTS**

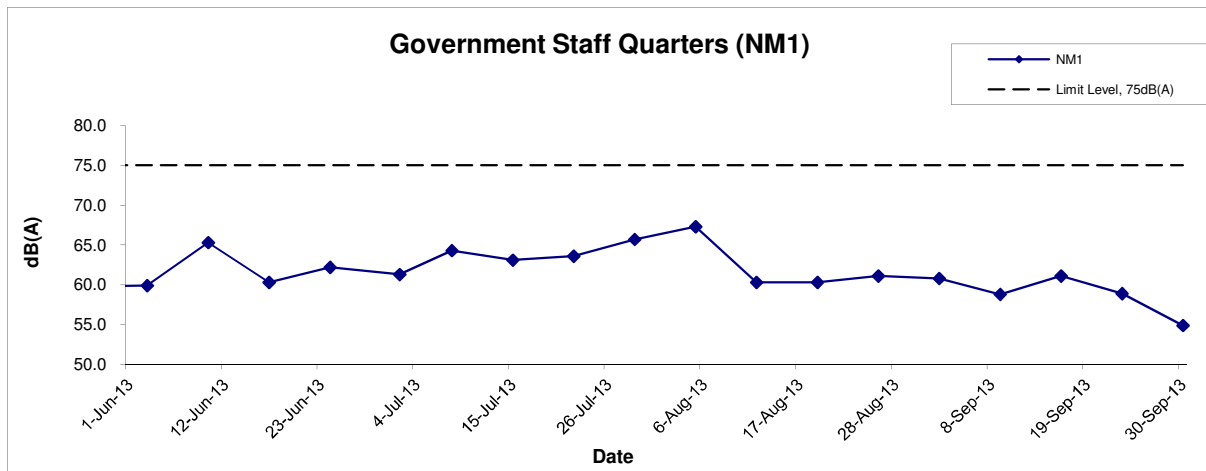
24-hr TSP Concentration Levels



Title Contract No. DE/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of 24-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA10069	
	Date Sep 13	Appendix E	

**APPENDIX F
GRAPHICAL PRESENTATION OF
NOISE MONITORING RESULTS**

Noise Levels



Title Contract No. DE/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Construction Noise Monitoring Results	Scale	Project No.	CINOTECH
	Date	Appendix	
	N.T.S	MA10069	
	Sep 13	F	

**APPENDIX G
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE**

**APPENDIX G – Updated Environmental Mitigation Implementation Schedule
 (During Construction Phase)**

Type of Impact	Recommended Mitigation Measures	Status
Air Quality	Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work	√
Noise	Use of quiet PME	N/A
	Good Site Practice <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities. 	√
Water Quality	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted to minimize the potential water quality impacts from construction site runoff and various construction activities. The recommendation to install perimeter drains to collect site runoff and to properly treat the runoff by settlement tank/treatment system shall apply to all sites including those for mainlaying works. Minimum distances of 100 m should be maintained between the discharge points of construction site runoff and the existing WSD saltwater intake at Tai Po.	√
	A discharge licence needs to be applied from EPD for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies with all the standards listed in the TM. Reuse and recycling of the treated effluent can minimize water consumption and reduce the effluent discharge volume. The beneficial uses of the treated effluent may include dust suppression, wheel washing and general cleaning. Monitoring of the discharge quality of treated effluent should be part of the Environmental Monitoring and Audit (EM&A) programme. Detailed effluent sampling programme for water quality control during construction phase should be submitted to EPD, AFCD and WSD for approval prior to commencement of the construction works.	N/A
	The construction programme should be properly planned to minimize soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimize dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all time. The stockpiles of materials should be placed in the locations away from any stream courses so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work. It is suggested that haul roads should be paved with concrete and the temporary access roads are protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.	√
	Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment. It is recommended to clean the construction sites on a regular basis.	√

Type of Impact	Recommended Mitigation Measures	Status
	It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should not be less than 30 m from any watercourse. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis. The construction workers can also make use of the existing toilet facilities within the TPSTW as necessary.	√
	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project. Implementation of environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	√
	It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√
	Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.	√
	<p>Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport • Chemical waste containers should be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 	√
	Marine water quality monitoring should be carried out under emergency condition or during maintenance of the THEES tunnel to verify the findings of the water quality modelling. It is recommended that the maintenance of the THEES tunnel, if unavoidable, should be conducted during winter season or low flow periods and to avoid the “blooming” season of algae (normally from April to June) if practicable. Details of the monitoring requirements are specified in the EM&A Manual.	N/A

Type of Impact	Recommended Mitigation Measures	Status
Waste Management	<p>Good site practices during the construction activities include: <input type="checkbox"/></p> <ul style="list-style-type: none"> • Nomination of approved personnel, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site. • Training of site personnel in proper waste management and chemical waste handling procedures. • Provision of sufficient waste disposal points and regular collection for disposal. • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. • A Waste Management Plan shall be prepared and this WMP shall be submitted to the Engineer for approval. One may make reference to ETWB TCW No. 15/2003 for details. • In order to monitor the disposal of C&D materials at landfills and public filling areas, and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may make reference to WBTC No. 21/2002 for details. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed. 	√
	<p>Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> • 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. • To encourage collection of aluminum cans by individual collectors, separate labelled bins shall be provided to segregate this waste from other general refuse generated by the work force. • Any unused chemicals or those with remaining functional capacity shall be recycled. • Maximize the use of reusable steel formwork to reduce the amount of C&D material. • Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimize the quantity of waste to be disposed of to landfill. • Proper storage and site practices to minimize the potential for damage or contamination of construction materials. • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste. • Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering 	√
	<p>General Refuse General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material.</p>	√
	<p>Construction & Demolition (C&D) Material C&D material generated from the site formation and demolition works shall be sorted on-site into inert C&D material (i.e. public fill) and C&D waste. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material comprising fill material shall be reused on-site as backfilling material as far as practicable. C&D waste, such as wood, plastic, steel and other metals shall be reused or recycled and, as a last resort, disposed of to landfill. A suitable area shall be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process.</p>	√

Type of Impact	Recommended Mitigation Measures	Status
	Bentonite Slurry Bentonite slurries used in construction works should be reconditioned and reused wherever practicable. Residual used bentonite slurry should be disposed of from the site as soon as possible. The Contractor should explore alternative disposal outlets for the residual used bentonite slurry and disposal at landfill should be the last resort.	N/A

Note:

- √ – Compliance of mitigation measures
- X – Non-compliance of mitigation measures
- N/A – Not applicable

**APPENDIX H
SUMMARY OF ENVIRONMENTAL
LICENSING AND PERMIT STATUS**

APPENDIX H – Summary of Environmental Licensing and Permit Status

Permit / License No.	Valid Period		Details	Status
	From	To		
Environmental Permit (EP)				
EP-265/2007	22/3/2007	N/A	<u>Expansion and upgrading of existing Tai Po Sewage Treatment Works from 100,000 m³/day to 130,000 m³/day:</u> (a) additional secondary treatment process units(1 primary clarified; 3 bioreactors and 2 final clarifiers); (b) reconstruction of 4 existing final clarified; (c) provision of ultraviolet disinfection facilities; (d) additional sludge treatment facilities; and (e) ancillary works to existing treatment facilities.	Valid
Registration of Chemical Waste Producer				
5517-727-T3270-01	--	N/A	Major chemical waste types: Spent lubricating oil, spend hydraulic oil, spend cooling oil, surplus paint, spent alkaline electrolyte, spent battery and battery parts containing heavy metals, scrap battery cell containing heavy metals, Nickel and its compounds, spent flammable liquid, spent copper etchant (Ferric chloride), Sodium hypochlorite, polymer, electric and torch bulbs and tubes, alkaline cleaner (spent alkaline solution)	Valid

**APPENDIX I
WASTE GENERATION IN THE
REPORTING QUARTER**

Name of Department: Drainage Services Department

Contract No. : DE/2009/09

Monthly Summary - Waste Flow Table for 2013

Month	Annual Quantities of Inert C&D Materials Generated Monthly						Annual Quantities of C&D Materials Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
Jan	0	0	0	0	0	0	0	0	0	0	5.0
Feb	0	0	0	0	0	0	0	0	0	0	1.8
Mar	0	0	0	0	0	0	0	0.13	0	0	2.0
Apr	0	0	0	0	0	0	0	0	0	0	1.2
May	0	0	0	0	0	0	0	0	0	0	1.4
June	0	0	0	0	0	0	0	0.07	0	0	0
July	0	0	0	0	0	0	0	0	0	0	4.4
Aug	0	0	0	0	0	0	0	0	0	600L	3.1
Sept	0	0	0	0	0	0	1.37	0	0	0	3.9
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	1.37	0.2	0	600L	22.8

Forecast of Total Quantities of C&D Materials to be Generated from the Contractor										
Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in m ³)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
0	Nil	0	0	0	0	100	100	50	10	500

- Notes:
- (1) The performance targets are given in PS Clause 1.40.8(14).
 - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (PS Clause 1.40.7(4)(b) refers).

APPENDIX J
SUMMARY OF EXCEEDANCE

APPENIDX J – SUMMARY OF EXCEEDANCE

Reporting Month: July to September 2013

- a) Exceedance Report for 1-hr TSP (NIL)**
- b) Exceedance Report for 24-hr TSP (NIL)**
- c) Exceedance Report for Construction Noise (NIL)**

**APPENDIX K
COMPLAINT LOG**

APPENDIX K – COMPLAINT LOG**Reporting Month:** July to September 2013

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

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