China Harbour Engineering Company Limited

Contract No. DC/2009/09
Construction of Tai Po Sewage Treatment Works – Stage V Phase II B

Quarterly Environmental Monitoring and Audit Summary Report (July to September 2012)

(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.

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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. DC/2009/09 "Construction of Tai Po Sewage Treatment Works – Stage V Phase IIB". This summary report presents EM&A works performed in the period between July and September 2012.

2. The construction activities undertaken in the reporting quarter include:

- Construction of Aeration Tanks, Mixed Liquor Channel, Primary Sedimentation Tank no.5, Sludge Draw-off Chamber No. 4, Flow Meter Chamber FMC1B, Cable Draw Pit and Laying Cable Duct, FC8B and FC10B;
- Construction of concrete plinths for Combined Heat and Power Generator at Stage I/II Works;
- Excavation for FMC2B, DN900 Sewage Pipe and Sludge Digestion Tank No. 3;
- Finishing works at proposed Switch Room, Decanting Chamber and Chemical & Oil Store;
- Finishing works on existing SAS Thickening House;
- Gas pipes from Valve Chamber for Bio-gas Holding Tank to Waste Burner and proposed Gas Transfer Station;
- Installation of DN1500 Air Main;
- Installation of irrigation system;
- Installation of Steel Bridges, Open Mesh Flooring, Aluminium Handrailing at Aeration Tanks;
- Mini-piling works and Pile Load Test at FC9B;
- Modification works at Chlorination House and Chemical House; and
- Sheet piling as shoring system for 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.

6. No Action Level (public complaint) / Limit Level exceedance was recorded in the reporting quarter.

Air Quality

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

Landfill Gas

8. In the reporting period, excavation works were undertaken within the 250m Consultation Zone of Shuen Wan Landfill. Landfill gas monitoring was performed by the Safety Officer of the Contractor. No Action/Limit Level exceedance was recorded in the reporting period.

Environmental Complaint and Prosecution

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

Environmental Licensing and Permitting

10. Environmental related licenses/permits granted to the Project include the Environmental Permit (EP) for the Project, the Discharge Licence, Construction Noise Permit and the Waste Disposal (Chemical Waste) Licence.

Future Key Issues

11. The anticipated environmental impacts will be mainly on ponding water and surface runoff as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:

- Cable ducting works;
- Construction of concrete plinths for Combined Heat and Power Generator at Stage I/II Works;
- Construction of DN1000 scum pipe between RAS Pumping Station and FMC2B;
- Construction of FC10B, MLC and Foam Removal Chamber;
- Construction ofFMC2B, Aeration Tank No. 7 and Sludge Digestion Tank No. 3;
- Demolition Draw-off Chamber No.3 and Control Room;
- Drainage and Excavation works;
- Excavation for FC9B;
- Finishing works for Gas Transfer House, proposed Switch Room, Decanting Chamber and Chemical & Oil Store;
- Installation of Cat-ladders, Handrailings and Steel Bridges;
- Installation of DN1500 air main & DN900 sewage pipeline;
- Installation of Irrigation System;
- Landscaping works;
- Modification works at Chlorination House into Gas Transfer Station;
- Piling works at MCL & Sludge Draw-off Chamber No. 3;
- Proof drilling at FC9B; and
- Water-tightness test for FC8B and Sludge Draw-off Chamber No. 4.

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/d and 130,000 m3/d 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 A**. A site layout plan is provided in **Figure 1.1**. The construction activities of the Project commenced on 3 July 2010.

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 Ltd. 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 2012.

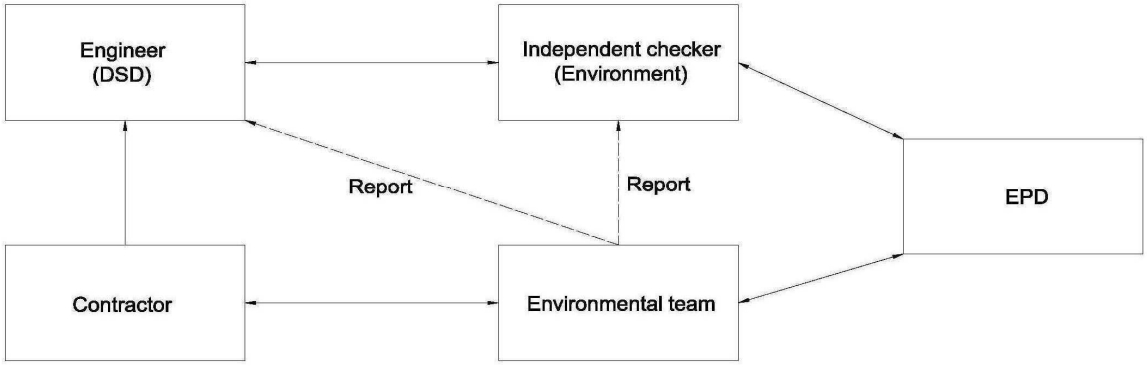
Project Organizations

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
- E&M Contractor –China Harbour Engineering Company 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	SP Division	Mr. LAI cheuk-ho	Chief Engineer	2594 7500	2827 8700
		Mr. IP Shu-kuen	Senior Engineer	2594 7502	
		Mr. TSANG Lap-kei	Engineer	2594 7459	
Cinotech	Environmental Team	Dr. Priscilla CHOY	ET Leader	2151 2089	3107 1388
		Mr. Ken CHENG	Project Coordinator and Audit Team Leader	2151 2077	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Arup	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2528 3031
		Mr. Lawrence KAN	Assistant to Independent Environmental Checker	2268 3212	
CHEC	Civil Contractor	Mr. TK CHEUNG	Project Manager	9863 2954	2603 6899
		Mr. Aaron AU	Site Agent	6345 0754	
		Mr. Jason TSE	Environmental Offiecr	9320 3608	

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:

- Construction of Aeration Tanks, Mixed Liquor Channel, Primary Sedimentation Tank no.5, Sludge Draw-off Chamber No. 4, Flow Meter Chamber FMC1B, Cable Draw Pit and Laying Cable Duct, FC8B and FC10B;
- Construction of concrete plinths for Combined Heat and Power Generator at Stage I/II Works;
- Excavation for FMC2B, DN900 Sewage Pipe and Sludge Digestion Tank No. 3;
- Finishing works at proposed Switch Room, Decanting Chamber and Chemical & Oil Store;
- Finishing works on existing SAS Thickening House;
- Gas pipes from Valve Chamber for Bio-gas Holding Tank to Waste Burner and proposed Gas Transfer Station;
- Installation of DN1500 Air Main;
- Installation of irrigation system;
- Installation of Steel Bridges, Open Mesh Flooring, Aluminium Handrailing at Aeration Tanks;

- Mini-piling works and Pile Load Test at FC9B;
- Modification works at Chlorination House and Chemical House; and
- Sheet piling as shoring system for 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 the reporting months, there is no alteration made on changing the location of the monitoring stations.

2.3 In accordance with clause 2.30 of the EM&A Manual, baseline checking of ambient Total Suspended Particulates (TSP) levels shall be carried out every six months at each monitoring location, when no dusty works activities are in operation. This provides data for the determination of the appropriate Action levels with the Limit levels set against statutory or otherwise agreed limits. A TSP baseline checking was conducted in July 2012 in accordance to the requirement stipulated in the EM&A Manual. The results are detailed in Section 3 of this report. The current Action and Limit levels for 1-hour TSP and 24-hour TSP monitoring are still representative and valid after considered results obtained the baseline checking.

Monitoring Methodology and Calibration Details

2.4 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)

2.5 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

2.6 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 and 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.

3.5 1-hour and 24-hour TSP baseline checking was conducted in July 2012 in accordance with clause 2.30 of the EM&A Manual. The baseline checking results for 1-hour TSP is within the range of baseline monitoring results presented in Baseline Monitoring Report. However, the baseline checking results for 24-hour TSP is below the range of baseline monitoring results presented in Baseline Monitoring Report. The monitoring dates and parameters are presented in **Table 3.1**.

Table 3.1 Measured Parameters and Results of the TSP Level Baseline Checking

Parameter	Monitoring Date	Monitoring Station	Average Baseline Checking Result (Range)	Average Baseline Monitoring Result (Range)
1-hour TSP	26,27 and 28 July 2012 (During Lunch Hour)	CAM1	68 (64-75)	100 (46-208)
		CAM2	85 (73-96)	132 (56-219)
		CAM3	90 (87-94)	144 (77-240)
24-hour TSP	29 July 2012 (Sunday)	CAM1	24	63 (39-116)
		CAM2	29	72 (43-130)
		CAM3	40	95 (60-159)

3.6 The rather low TSP level obtained in the baseline checking might consider being a consequence of heavy rain episodes during the period when the 1-hour TSP and 24-hour TSP baseline checking carried out. The baseline checking result is primarily affected by rainy weather but not significant changes in the ambient conditions in the vicinity of the Contract. Therefore, the current Action and Limit levels for 1-hour TSP and 24-hour TSP monitoring are still representative and valid.

Construction Noise

3.7 All construction noise monitoring was conducted as scheduled in the reporting period.

3.8 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.

Landfill Gas

3.9 All Landfill gas measurements were performed by the Safety Officer of the civil works Contractor (CHEC) in the reporting period.

3.10 Graphical representations of the monitoring results are shown in **Appendix G**. No Action/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	4 Jul 2012	Reminder: Wheel washing bay near FC12B should be cleaned.	The observation was observed to be rectified by the Contractor during the audit session on 10 Aug 2012.
	4 Jul 2012	Reminder: The mud water puddle near the site entrance should be cleared properly.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	13 Jul 2012	Reminder: Remove the stagnant water at Air Main 1500.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	13 Jul 2012	Reminder: Remove the stagnant water at PST5.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	19 Jul 2012	The water pond opposite to FMC1B should be cleared up.	Accumulation of stagnant water opposite to FMC1B arises from daily operation of TPSTW, but not construction activities by the Contractor. However, it was suggested the Contractor shall report this deficiency to the corresponding party for rectifying the situation during the audit session on 27 Jul 2012.
	10 Aug 2012	Reminder: The stagnant water at Air Main 1500 should be removed and pumped out into appropriate watercourse before discharging.	The observation was observed to be rectified by the Contractor during the audit session on 16 Aug 2012.
	16 Aug 2012	The stockpile near FMC2B should be properly managed (e.g. keep away from the drainage or by other means) to avoid mud and sands directly discharged into drainage during rainstorms.	The observation was observed to be rectified by the Contractor during the audit session on 24 Aug 2012.
	30 Aug 2012	Stagnant water at the concrete pit near DSD site office should be pumped out.	The observation was observed to be rectified by the Contractor during the audit session on 6 Sep 2012.
	30 Aug 2012	Reminder: Water at wheel washing bay was observed silty.	The observation was observed improved/rectified by the Contractor during the audit session on 14 Sep 2012.

Parameters	Date	Observations and Recommendations	Follow-up
	14 Sep 2012	Reminder: Stagnant water at DN 1500 Air Main should be pumped out.	The observation was observed improved/rectified by the Contractor during the audit session on 21 Sep 2012.
	14 Sep 2012	Reminder: Remaining water at sedimentation tank next to DN 1500 Air Main should be removed.	The observation was observed improved/rectified by the Contractor during the audit session on 21 Sep 2012.
	21 Sep 2012	Remove the sand and silt at the sedimentation tank near FC11B.	The observation was observed improved/rectified by the Contractor during the audit session on 27 Sep 2012.
Air Quality	4 Jul 2012	Reminder: Clear the soil at access road near SAS thickness house.	The observation was observed to be rectified by the Contractor during the audit session on 19 Jul 2012.
	19 Jul 2012	The soil and cement on the side of access road near site office should be removed.	The observation was observed to be rectified by the Contractor during the audit session on 27 Jul 2012.
	21 Sep 2012	Reminder: Water spray on unpaved haul road regularly to avoid dust generation.	Follow-up action is needed in the next reporting period.
	27 Sep 2012	Reminder: Dusty stockpile not in use should be covered by tarpaulin.	Follow-up action is needed in the next reporting period.
	27 Sep 2012	Reminder: Sand and silt accumulated on the roadside near Dewatering House should be removed.	Follow-up action is needed in the next reporting period.
Noise	--	--	--
Waste / Chemical Management	4 Jul 2012	Reminder: The after-used cement bags should be disposed properly near FC7B.	The observation was observed to be rectified by the Contractor during the audit session on 13 Jul 2012.
	13 Jul 2012	Reminder: Remove the debris at the chemical and oil storage room.	The observation was observed to be rectified by the Contractor during the audit session on 19 Jul 2012.
	19 Jul 2012	Reminder: The debris near the water pond opposite to FMC1B should be properly disposed.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	19 Jul 2012	The chemical stocks and wastes in front of the storage room next to safety office should be properly managed.	The observation was observed to be rectified by the Contractor during the audit session on 27 Jul 2012.
	27 Jul 2012	Reminder: The debris near the Air Main 1500 should be properly disposed.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	27 Jul 2012	Reminder: The debris next to wheel washing bay should be properly disposed.	The observation was observed to be rectified by the Contractor during the audit session on 2 Aug 2012.
	2 Aug 2012	Reminder: Drip tray at FC7B should be properly managed.	The observation was observed to be rectified by the Contractor during the audit session on 10 Aug 2012.

Parameters	Date	Observations and Recommendations	Follow-up
	2 Aug 2012	Reminder: Drip tray should be provided for storage of chemicals at chemical storage room.	The observation was observed to be rectified by the Contractor during the audit session on 10 Aug 2012.
	2 Aug 2012	Reminder: Stagnant water on drip tray should be removed.	The observation was observed to be rectified by the Contractor during the audit session on 10 Aug 2012.
	2 Aug 2012	Reminder: Debris near UV disinfection room should be properly cleared.	The observation was observed to be rectified by the Contractor during the audit session on 10 Aug 2012.
	10 Aug 2012	Reminder: The debris at FC6B should be properly disposed.	The observation was observed to be rectified by the Contractor during the audit session on 16 Aug 2012.
	10 Aug 2012	Reminder: The chemical wastes and container near the newly-built shelter should be properly managed.	The observation was observed to be rectified by the Contractor during the audit session on 24 Aug 2012.
Waste / Chemical Management	16 Aug 2012	Reminder: The drip tray should be well maintained to avoid accumulation of stagnant water.	The observation was observed to be rectified by the Contractor during the audit session on 24 Aug 2012.
	16 Aug 2012	Reminder: The debris and litter at FC6B should be properly disposed.	The observation was observed to be rectified by the Contractor during the audit session on 24 Aug 2012.
	30 Aug 2012	Reminder: Dusty debris at Chemical House should be properly disposed.	The observation was observed improved/rectified by the Contractor during the audit session on 14 Sep 2012.
	30 Aug 2012	Reminder: Litter and rubbish near wheel washing bay should be properly disposed.	The observation was observed to be improved by the Contractor during the audit session on 6 Sep 2012.
	6 Sep 2012	Fuel leakage was observed from PME near Dewatering House. The mud on contaminated area should be properly disposed as chemical wastes.	Follow-up action is needed in the next reporting period.
	6 Sep 2012	Reminder: Chemical Stocks near Digestion Tank should be properly managed.	The observation was observed improved/rectified by the Contractor during the audit session on 14 Sep 2012.
	6 Sep 2012	Reminder: The litter should be properly disposed near wheel washing bay.	The observation was observed improved/rectified by the Contractor during the audit session on 14 Sep 2012.
	21 Sep 2012	Reminder: Dispose the rubbish and debris at Chemical House properly.	The observation was observed improved/rectified by the Contractor during the audit session on 27 Sep 2012.
	27 Sep 2012	Fuel leakage was observed from the excavator (Permit no. TP052).	The observation was observed improved/rectified by the Contractor during the audit session on 27 Sep 2012.
	27 Sep 2012	Reminder: Oil stain was observed near sludge digestion tank.	Follow-up action is needed in the next reporting period.

Parameters	Date	Observations and Recommendations	Follow-up
Permit/Licenses	27 Sep 2012	Construction Noise Permit posted at site entrance should be updated.	Follow-up action is needed in the next reporting period.

Status of Environmental Licensing and Permitting

4.3 Environmental licenses and permits including the Environmental Permit (EP), the Construction Noise Permit and Waste Disposal (Chemical Waste) License 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 3696 m^3 of inert C&D waste, non-inert C&D waste including 21 m^3 of general refuse were disposed in the reporting quarter. No paper/cardboard packaging was disposed in the reporting quarter. Excavated materials, as the main C&D materials generated in the reporting period, were stored inside the Site Area and Stockpiling Area of the Project. Besides, no 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 2012. 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.

5.4 No Action/Limit Level exceedance for landfill gas monitoring was recorded in the reporting period.

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

5.5 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 All landfill gas monitoring levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.

7.6 There was no environmental complaint, prosecution or notification of summons received.

7.7 The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:

- Cable ducting works;
- Construction of concrete plinths for Combined Heat and Power Generator at Stage I/II Works;
- Construction of DN1000 scum pipe between RAS Pumping Station and FMC2B;
- Construction of FC10B, MLC and Foam Removal Chamber;
- Construction ofFMC2B, Aeration Tank No. 7 and Sludge Digestion Tank No. 3;
- Demolition Draw-off Chamber No.3 and Control Room;
- Drainage and Excavation works;
- Excavation for FC9B;
- Finishing works for Gas Transfer House, proposed Switch Room, Decanting Chamber and Chemical & Oil Store;
- Installation of Cat-ladders, Handrailings and Steel Bridges;
- Installation of DN1500 air main & DN900 sewage pipeline;
- Installation of Irrigation System;
- Landscaping works;
- Modification works at Chlorination House into Gas Transfer Station;
- Piling works at MCL & Sludge Draw-off Chamber No. 3;
- Proof drilling at FC9B; and
- Water-tightness test for FC8B and Sludge Draw-off Chamber No. 4.

Recommendations

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

Water Impact

- Avoid accumulation of stagnant water on site.
- Avoid blockage of gully inlets and ensure proper protection of the gully from ingress of sandy water.
- Ensure proper use and maintenance of the de-silting facilities.
- Maintain sand bags placed along the u-channel at good condition and replace the broken bags.
- Provide sediment tank for settling runoff prior to disposal.
- Remove and settle out sand and silt at wheel washing facilities regularly.

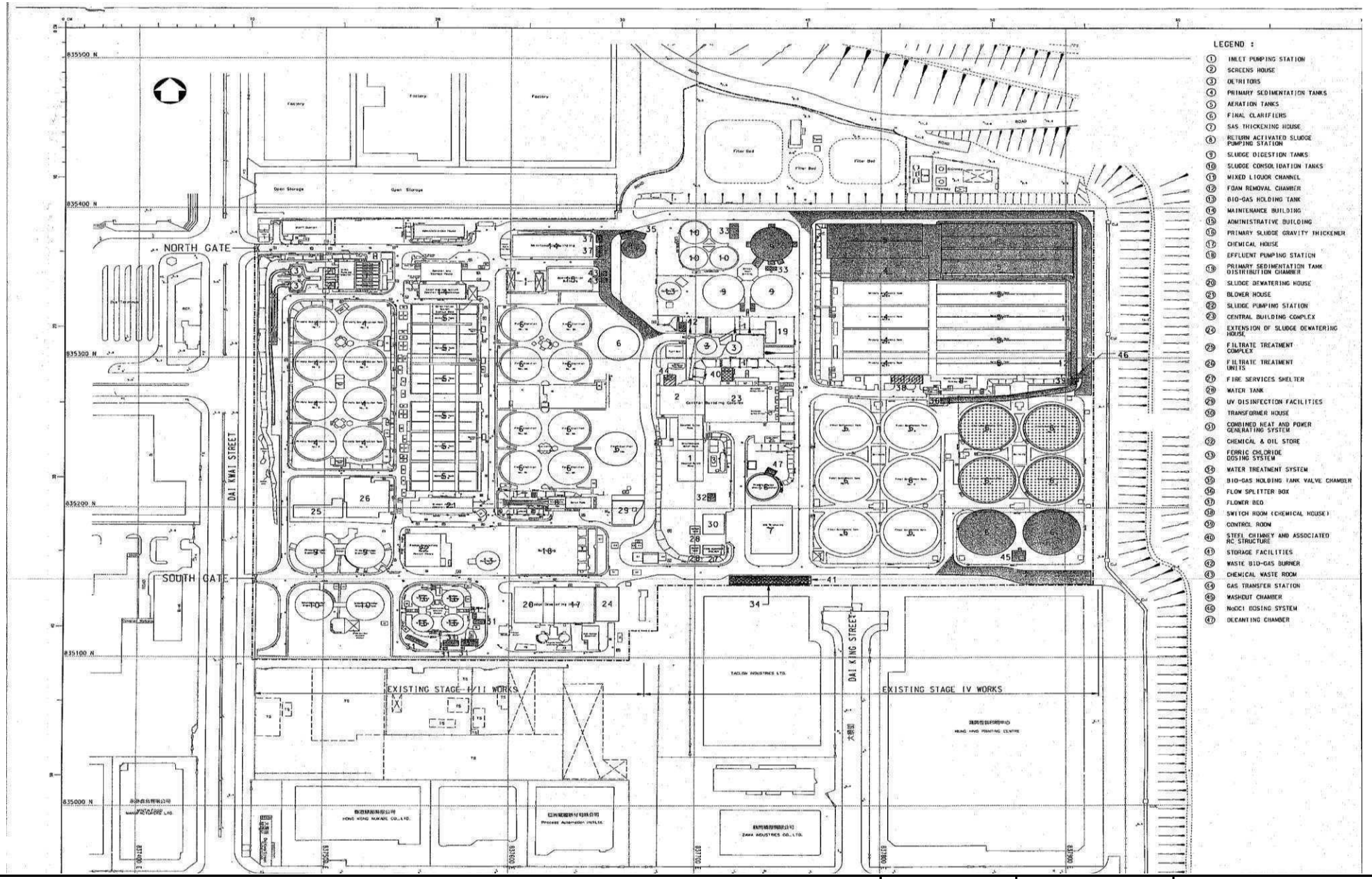
Dust Impact

- Cover the excavated dusty materials or stockpile of dusty materials by impervious sheeting, or spray water on the dusty materials so as to maintain entire surface wet.
- Remove fugitive dusty material on the haul road periodically.
- Spray with water on the surface of concrete breaking and dry dust haul road.

Waste / Chemical Management

- Avoid and check for any accumulation of waste materials or rubbish on site.
- Avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment.
- Provide drip tray with adequate capacity and maintain well for equipment and chemical waste.
- Provide proper rubbish bins / skips for waste collection.

FIGURES



TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

PROJECT SITE LAYOUT PLAN (TPSTW)

Scale N.T.S	Project No. MA0010
Date Jul-10	Figure 1.1

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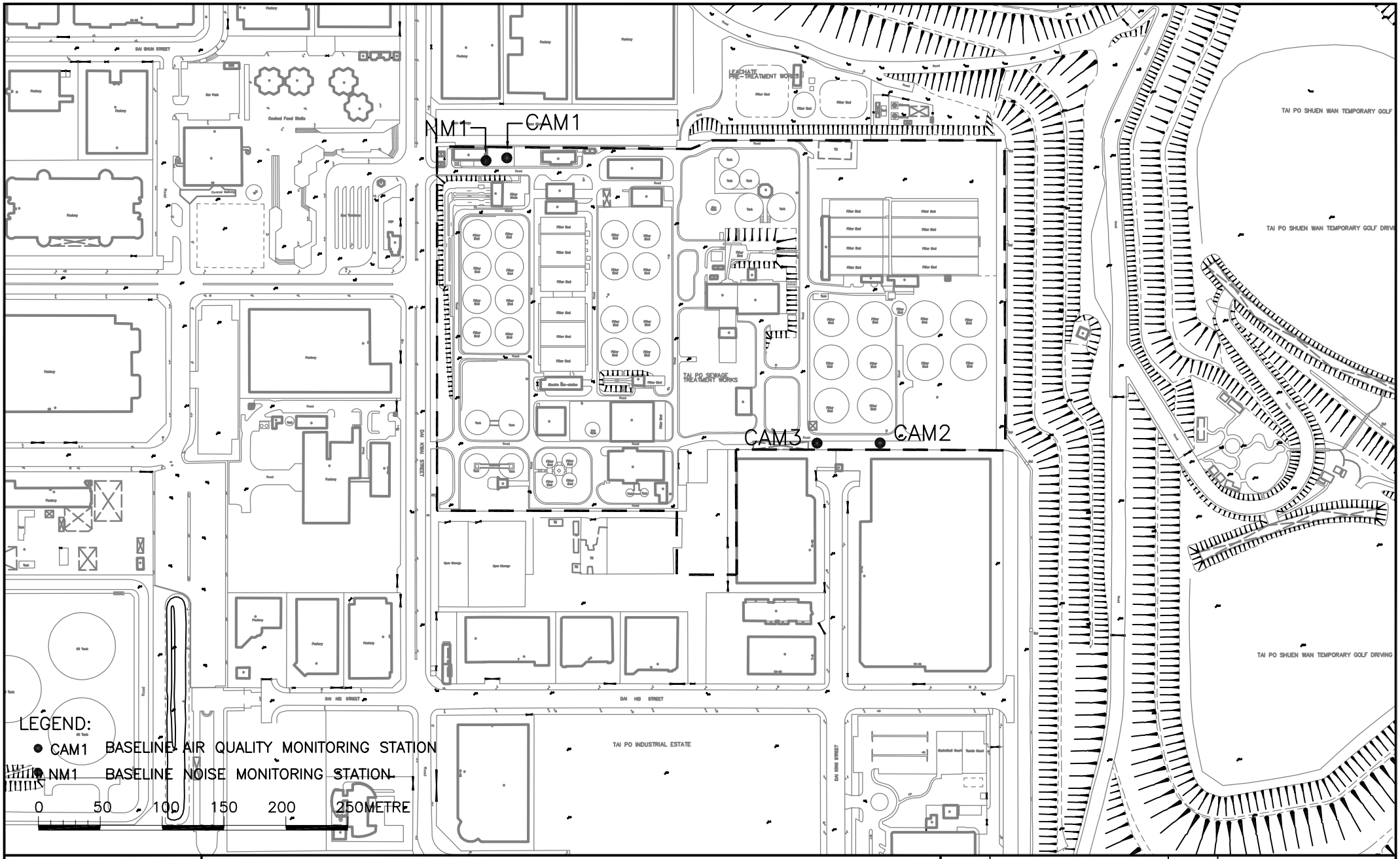

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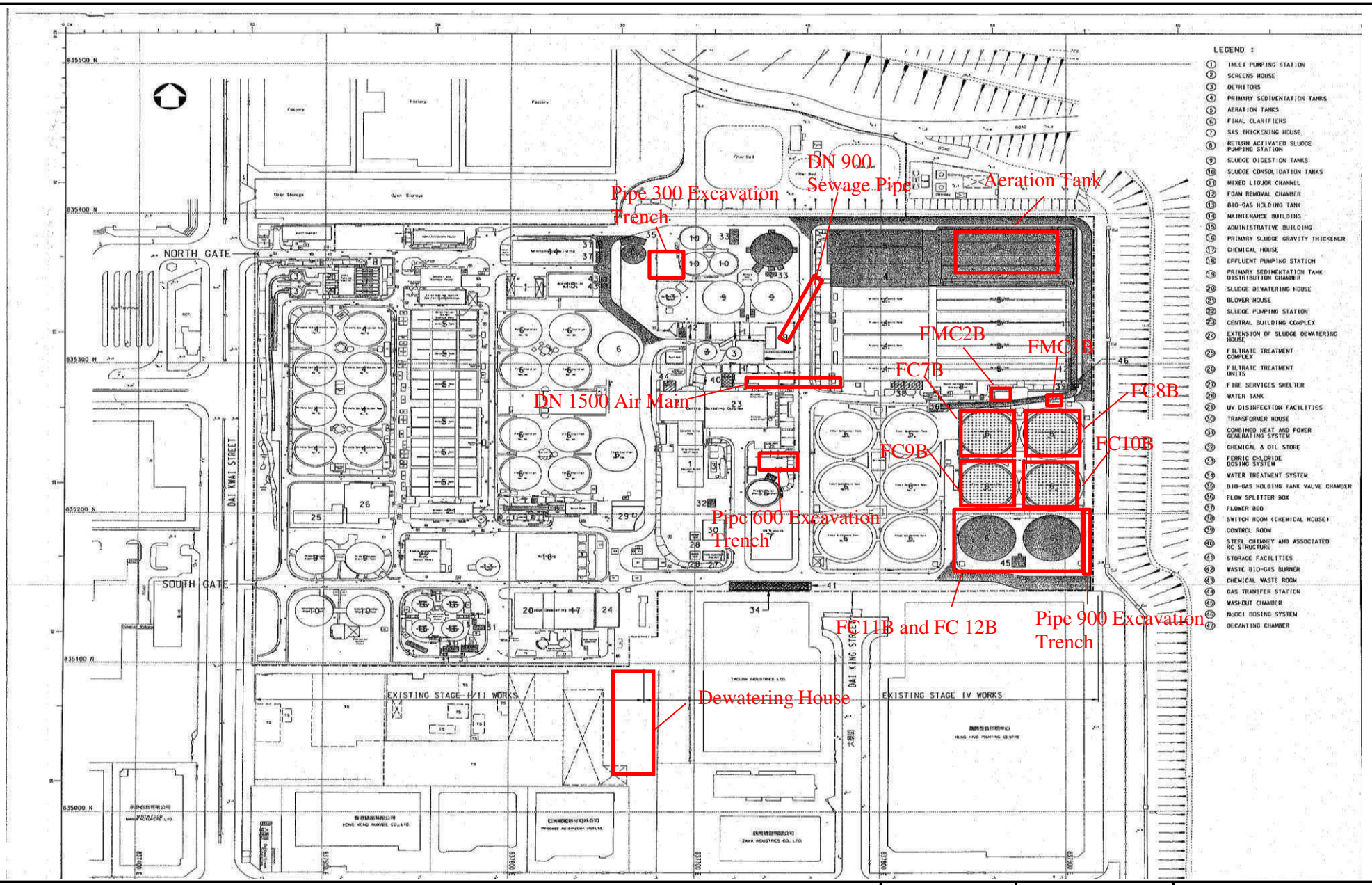
Tai Po Sewage Treatment Work, Stage V, Phase IIB

LOCATIONS OF AIR QUALITY AND NOISE MONITORING STATIONS

SCALE	A4 1:4000	DATE	2010
CHECK	IT	DRAWN	SL
JOB No.	MA0010	DRAWING No.	1.2
		REV	–

F:\MA0010\DRAWING\BASELINE\FIGURE 1.2.DWG



TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

Landfill Gas Monitoring Area(TPSTW)

Scale N.T.S	Project No. MA0010
Date Sep-12	Figure 1.3

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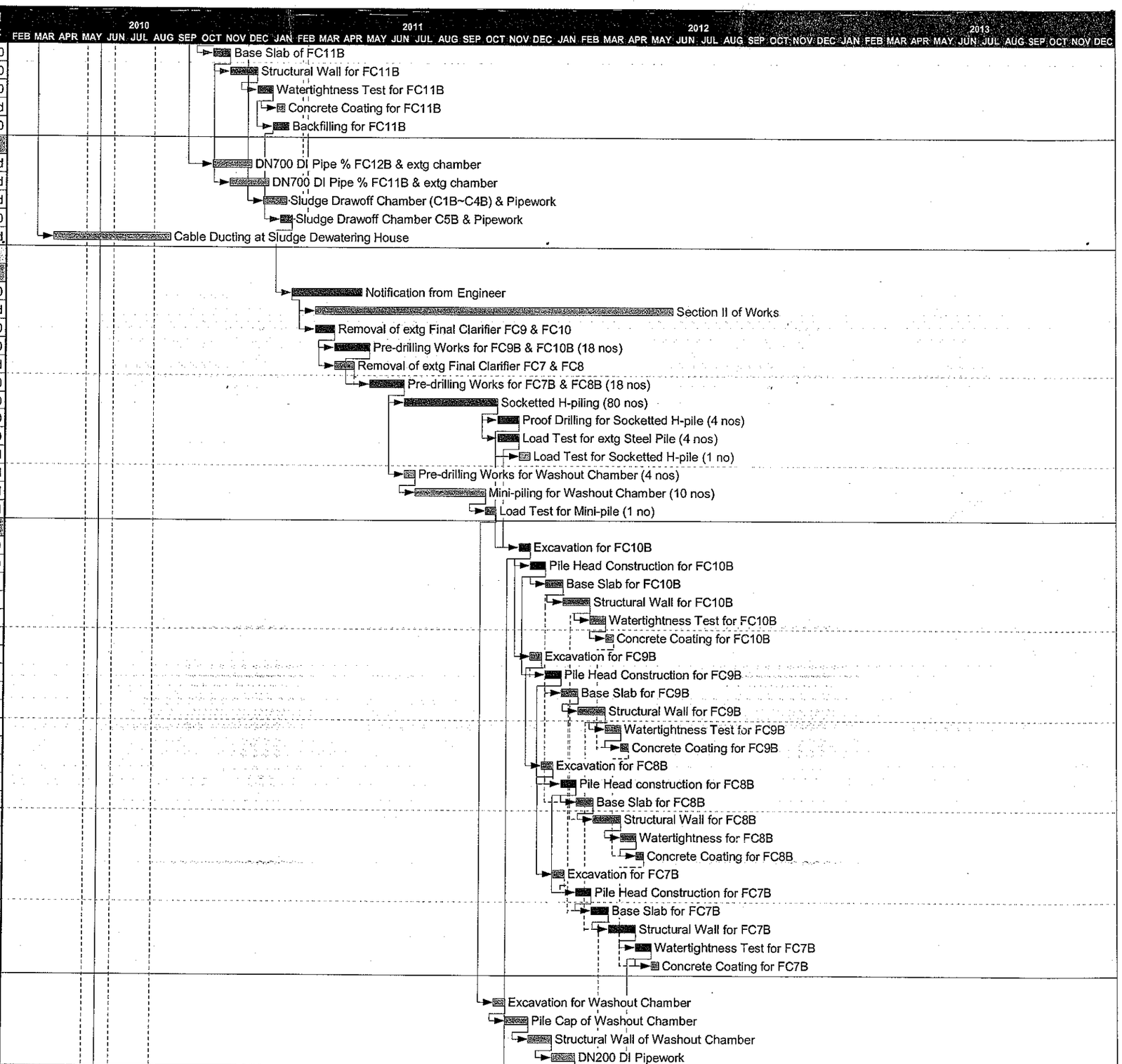
APPENDIX A
CONSTRUCTION PROGRAMME

Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float
12025	Base Slab of FC11B	22	19OCT10	09NOV10	0
12030	Structural Wall for FC11B	35	10NOV10	14DEC10	0
12040	Watertightness Test for FC11B	20	15DEC10	03JAN11	0
12050	Concrete Coating for FC11B	10	09JAN11	18JAN11	10d
12060	Backfilling for FC11B	20	04JAN11	23JAN11	0
Pipeline Works					
13010	DN700 DI Pipe % FC12B & extg chamber	50	19OCT10	07DEC10	52d
13020	DN700 DI Pipe % FC11B & extg chamber	50	10NOV10	29DEC10	30d
13030	Sludge Drawoff Chamber (C1B~C4B) & Pipework	30	23DEC10	21JAN11	7d
13040	Sludge Drawoff Chamber C5B & Pipework	15	14JAN11	28JAN11	0
13050	Cable Ducting at Sludge Dewatering House	150	30MAR10	26AUG10	155d
Section II of Works					
Drilling Works					
20001	Notification from Engineer	90	29JAN11	28APR11	0
20010	Section II of Works	460	28FEB11	01JUN12	90d
20110	Removal of extg Final Clarifier FC9 & FC10	25	28FEB11	24MAR11	0
20120	Pre-drilling Works for FC9B & FC10B (18 nos)	45	25MAR11	08MAY11	0
20130	Removal of extg Final Clarifier FC7 & FC8	25	25MAR11	18APR11	20d
20135	Pre-drilling Works for FC7B & FC8B (18 nos)	45	09MAY11	22JUN11	0
20140	Socketted H-piling (80 nos)	120	23JUN11	20OCT11	0
20145	Proof Drilling for Socketted H-pile (4 nos)	28	21OCT11	17NOV11	0
20150	Load Test for extg Steel Pile (4 nos)	28	21OCT11	17NOV11	0
20160	Load Test for Socketted H-pile (1 no)	14	18NOV11	01DEC11	183d
20180	Pre-drilling Works for Washout Chamber (4 nos)	14	23JUN11	06JUL11	7d
20190	Mini-piling for Washout Chamber (10 nos)	90	07JUL11	04OCT11	7d
20200	Load Test for Mini-pile (1 no)	14	05OCT11	18OCT11	7d
Fluat Clarifier No. FC7B to FC10B					
21030	Excavation for FC10B	15	18NOV11	02DEC11	0
21040	Pile Head Construction for FC10B	20	03DEC11	22DEC11	0
21050	Base Slab for FC10B	22	23DEC11	13JAN12	30d
21060	Structural Wall for FC10B	35	14JAN12	17FEB12	30d
21070	Watertightness Test for FC10B	20	18FEB12	08MAR12	45d
21080	Concrete Coating for FC10B	10	09MAR12	18MAR12	45d
21100	Excavation for FC9B	15	03DEC11	17DEC11	5d
21110	Pile Head Construction for FC9B	20	23DEC11	11JAN12	0
21120	Base Slab for FC9B	22	12JAN12	02FEB12	5d
21130	Structural Wall for FC9B	35	03FEB12	08MAR12	5d
21140	Watertightness Test for FC9B	20	09MAR12	28MAR12	35d
21150	Concrete Coating for FC9B	10	29MAR12	07APR12	35d
21170	Excavation for FC8B	15	18DEC11	01JAN12	10d
21180	Pile Head construction for FC8B	20	12JAN12	31JAN12	0
21190	Base Slab for FC8B	22	01FEB12	22FEB12	25d
21200	Structural Wall for FC8B	35	23FEB12	28MAR12	25d
21210	Watertightness for FC8B	20	29MAR12	17APR12	25d
21220	Concrete Coating for FC8B	10	18APR12	27APR12	25d
21230	Excavation for FC7B	15	02JAN12	16JAN12	15d
21240	Pile Head Construction for FC7B	20	01FEB12	20FEB12	0
21250	Base Slab for FC7B	22	21FEB12	13MAR12	0
21260	Structural Wall for FC7B	35	14MAR12	17APR12	0
21270	Watertightness Test for FC7B	20	18APR12	07MAY12	0
21280	Concrete Coating for FC7B	10	08MAY12	17MAY12	15d
Pipeline Works					
22010	Excavation for Washout Chamber	15	19OCT11	02NOV11	7d
22020	Pile Cap of Washout Chamber	30	03NOV11	02DEC11	7d
22030	Structural Wall of Washout Chamber	30	03DEC11	01JAN12	7d
22040	DN200 DI Pipework	30	02JAN12	31JAN12	7d



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China Harbour Engineering Co. Ltd.
TPSTW Stage 5 Phase 2B

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05FEB10	0	WML	TKC
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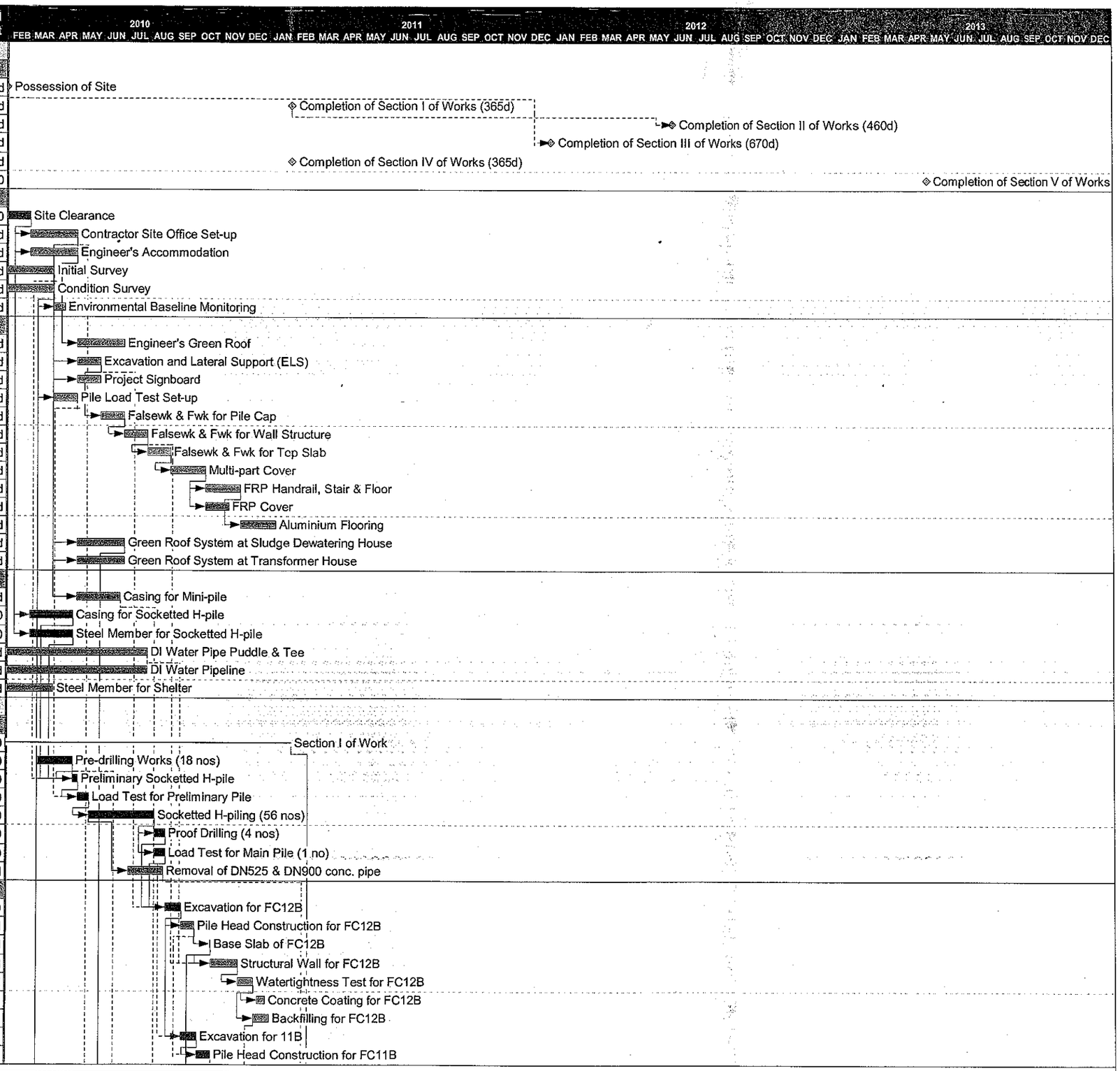
Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float
General					
Project Key Date					
1000	Possession of Site	0		28JAN10	1155d
10000	Completion of Section I of Works (365d)	0		28JAN11	790d
20000	Completion of Section II of Works (460d)	0		01JUN12	330d
30000	Completion of Section III of Works (670d)	0		28DEC11	486d
40000	Completion of Section IV of Works (365d)	0		28JAN11	820d
50000	Completion of Section V of Works (1185d)	0		27APR13	0
Preliminary					
1010	Site Clearance	30	29JAN10	27FEB10	0
1020	Contractor Site Office Set-up	60	28FEB10	28APR10	84d
1030	Engineer's Accommodation	60	28FEB10	28APR10	1035d
1040	Initial Survey	60	29JAN10	29MAR10	25d
1050	Condition Survey	60	29JAN10	29MAR10	2d
1060	Environmental Baseline Monitoring	14	30MAR10	12APR10	1111d
Submission for Approval					
2010	Engineer's Green Roof	60	29APR10	27JUN10	1035d
2020	Excavation and Lateral Support (ELS)	30	29APR10	28MAY10	84d
2030	Project Signboard	30	29APR10	28MAY10	1065d
2040	Pile Load Test Set-up	30	30MAR10	28APR10	2d
2050	Falsewk & Fwk for Pile Cap	30	29MAY10	27JUN10	90d
2060	Falsewk & Fwk for Wall Structure	30	28JUN10	27JUL10	90d
2070	Falsewk & Fwk for Top Slab	30	28JUL10	26AUG10	840d
2080	Multi-part Cover	45	27AUG10	10OCT10	840d
2090	FRP Handrail, Stair & Floor	45	11OCT10	24NOV10	840d
2100	FRP Cover	30	11OCT10	09NOV10	900d
2110	Aluminium Flooring	45	25NOV10	08JAN11	840d
2120	Green Roof System at Sludge Dewatering House	60	29APR10	27JUN10	310d
2130	Green Roof System at Transformer House	60	29APR10	27JUN10	1035d
Material Fabrication & Delivery					
3010	Casing for Mini-pile	55	29APR10	22JUN10	173d
3020	Casing for Socketted H-pile	55	28FEB10	23APR10	0
3030	Steel Member for Socketted H-pile	55	28FEB10	23APR10	0
3040	DI Water Pipe Puddle & Tee	180	29JAN10	27JUL10	90d
3050	DI Water Pipeline	180	29JAN10	27JUL10	1005d
3060	Steel Member for Shelter	60	29JAN10	29MAR10	1125d
Section I of Works					
Drilling Works					
10010	Section I of Work	365*	29JAN10	28JAN11	0
10100	Pre-drilling Works (18 nos)	45	10MAR10	23APR10	0
10110	Preliminary Socketted H-pile	7	24APR10	30APR10	0
10120	Load Test for Preliminary Pile	14	01MAY10	14MAY10	0
10130	Socketted H-piling (56 nos)	84	15MAY10	06AUG10	0
10140	Proof Drilling (4 nos)	14	07AUG10	20AUG10	0
10150	Load Test for Main Pile (1 no)	14	07AUG10	20AUG10	0
10160	Removal of DN525 & DN900 conc. pipe	45	04JUL10	17AUG10	164d
Final Clarifier No. FC11B & FC12B					
11010	Excavation for FC12B	21	21AUG10	10SEP10	0
11020	Pile Head Construction for FC12B	17	11SEP10	27SEP10	4d
11025	Base Slab of FC12B	22	18OCT10	18OCT10	7d
11030	Structural Wall for FC12B	35	19OCT10	22NOV10	7d
11040	Watertightness Test for FC12B	20	23NOV10	12DEC10	7d
11050	Concrete Coating for FC12B	10	18DEC10	27DEC10	32d
11060	Backfilling for FC12B	20	13DEC10	01JAN11	7d
12010	Excavation for 11B	21	11SEP10	01OCT10	0
12020	Pile Head Construction for FC11B	17	02OCT10	18OCT10	0



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TPSTW Stage 5 Phase 2B

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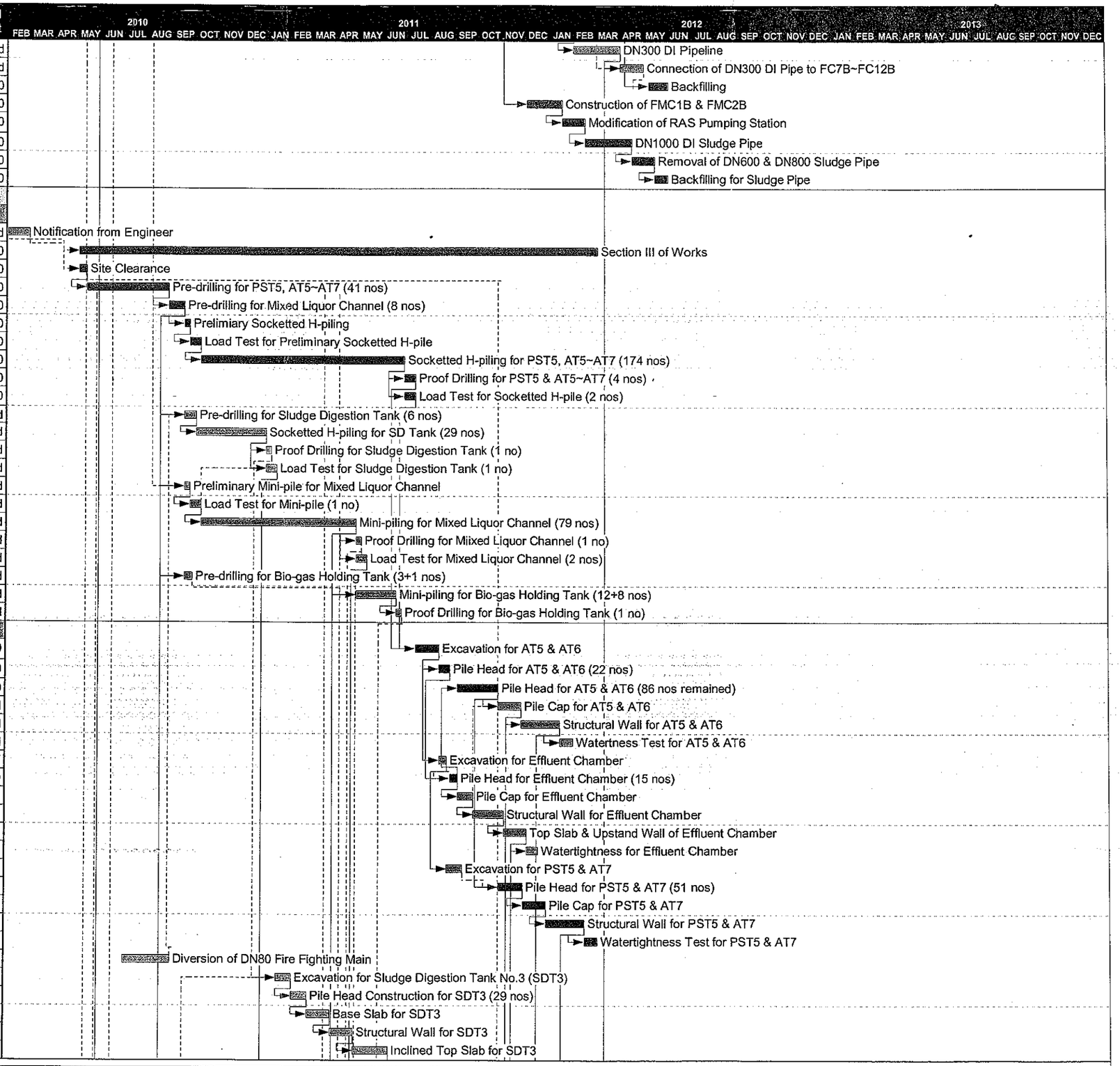
Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float
22045	DN300 DI Pipeline	60	01FEB12	31MAR12	7d
22050	Connection of DN300 DI Pipe to FC7B~FC12B	30	01APR12	30APR12	7d
22060	Backfilling	25	08MAY12	01JUN12	0
22070	Construction of FMC1B & FMC2B	45	03DEC11	16JAN12	0
22075	Modification of RAS Pumping Station	30	17JAN12	15FEB12	0
22080	DN1000 DI Sludge Pipe	60	16FEB12	15APR12	0
22090	Removal of DN600 & DN800 Sludge Pipe	30	16APR12	15MAY12	0
22100	Backfilling for Sludge Pipe	17	16MAY12	01JUN12	0
Section III of Works					
Drilling Works					
30001	Notification from Engineer	30	29JAN10	27FEB10	64d
30005	Section III of Works	670	03MAY10	02MAR12	0
30110	Site Clearance	10	03MAY10	12MAY10	0
30120	Pre-drilling for PST5, AT5~AT7 (41 nos)	106	13MAY10	26AUG10	0
30130	Pre-drilling for Mixed Liquor Channel (8 nos)	20	27AUG10	15SEP10	0
30140	Prelimiary Socketted H-piling	7	16SEP10	22SEP10	0
30150	Load Test for Preliminary Socketted H-pile	14	23SEP10	06OCT10	0
30160	Socketted H-piling for PST5, AT5~AT7 (174 nos)	263	07OCT10	26JUN11	0
30170	Proof Drilling for PST5 & AT5~AT7 (4 nos)	14	27JUN11	10JUL11	0
30180	Load Test for Socketted H-pile (2 nos)	14	27JUN11	10JUL11	0
30190	Pre-drilling for Sludge Digestion Tank (6 nos)	15	16SEP10	30SEP10	225d
30200	Socketted H-piling for SD Tank (29 nos)	90	01OCT10	29DEC10	225d
30210	Proof Drilling for Sludge Digestion Tank (1 no)	7	30DEC10	05JAN11	232d
30215	Load Test for Sludge Digestion Tank (1 no)	14	30DEC10	12JAN11	225d
30220	Preliminary Mini-pile for Mixed Liquor Channel	7	16SEP10	22SEP10	88d
30230	Load Test for Mini-pile (1 no)	14	23SEP10	06OCT10	88d
30240	Mini-piling for Mixed Liquor Channel (79 nos)	200	07OCT10	24APR11	88d
30250	Proof Drilling for Miixed Liquor Channel (1 no)	7	25APR11	01MAY11	111d
30260	Load Test for Mixed Liquor Channel (2 nos)	14	25APR11	08MAY11	104d
30270	Pre-drilling for Bio-gas Holding Tank (3+1 nos)	10	16SEP10	25SEP10	250d
30280	Mini-piling for Bio-gas Holding Tank (12+8 nos)	52	25APR11	15JUN11	145d
30290	Proof Drilling for Bio-gas Holding Tank (1 no)	7	16JUN11	22JUN11	145d
Primary Sedimentation Tank & Aeration Tank					
31010	Excavation for AT5 & AT6	30	11JUL11	09AUG11	0
31020	Pile Head for AT5 & AT6 (22 nos)	14	10AUG11	23AUG11	0
31025	Pile Head for AT5 & AT6 (86 nos remained)	53	03SEP11	25OCT11	0
31030	Pile Cap for AT5 & AT6	30	26OCT11	24NOV11	32d
31040	Structural Wall for AT5 & AT6	50	25NOV11	13JAN12	32d
31050	Watertness Test for AT5 & AT6	17	14JAN12	30JAN12	32d
31060	Excavation for Effluent Chamber	10	10AUG11	19AUG11	4d
31070	Pile Head for Effluent Chamber (15 nos)	10	24AUG11	02SEP11	0
31080	Pile Cap for Effluent Chamber	20	03SEP11	22SEP11	65d
31090	Structural Wall for Effluent Chamber	40	23SEP11	01NOV11	73d
31100	Top Slab & Upstand Wall of Effluent Chamber	30	02NOV11	01DEC11	73d
31110	Watertightness for Effluent Chamber	15	02DEC11	16DEC11	77d
31120	Excavation for PST5 & AT7	20	20AUG11	08SEP11	47d
31130	Pile Head for PST5 & AT7 (51 nos)	32	26OCT11	26NOV11	0
31140	Pile Cap for PST5 & AT7	30	27NOV11	26DEC11	0
31150	Structural Wall for PST5 & AT7	50	27DEC11	14FEB12	0
31160	Watertightness Test for PST5 & AT7	17	15FEB12	02MAR12	0
31165	Diversion of DN80 Fire Fighting Main	60	01JUL10 *	29AUG10	242d
31170	Excavation for Sludge Digestion Tank No.3 (SDT3)	20	13JAN11	01FEB11	225d
31180	Pile Head Construction for SDT3 (29 nos)	20	02FEB11	21FEB11	225d
31190	Base Slab for SDT3	30	22FEB11	23MAR11	225d
31200	Structural Wall for SDT3	30	24MAR11	22APR11	225d
31210	Inclined Top Slab for SDT3	45	23APR11	06JUN11	225d



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TPSTW Stage 5 Phase 2B

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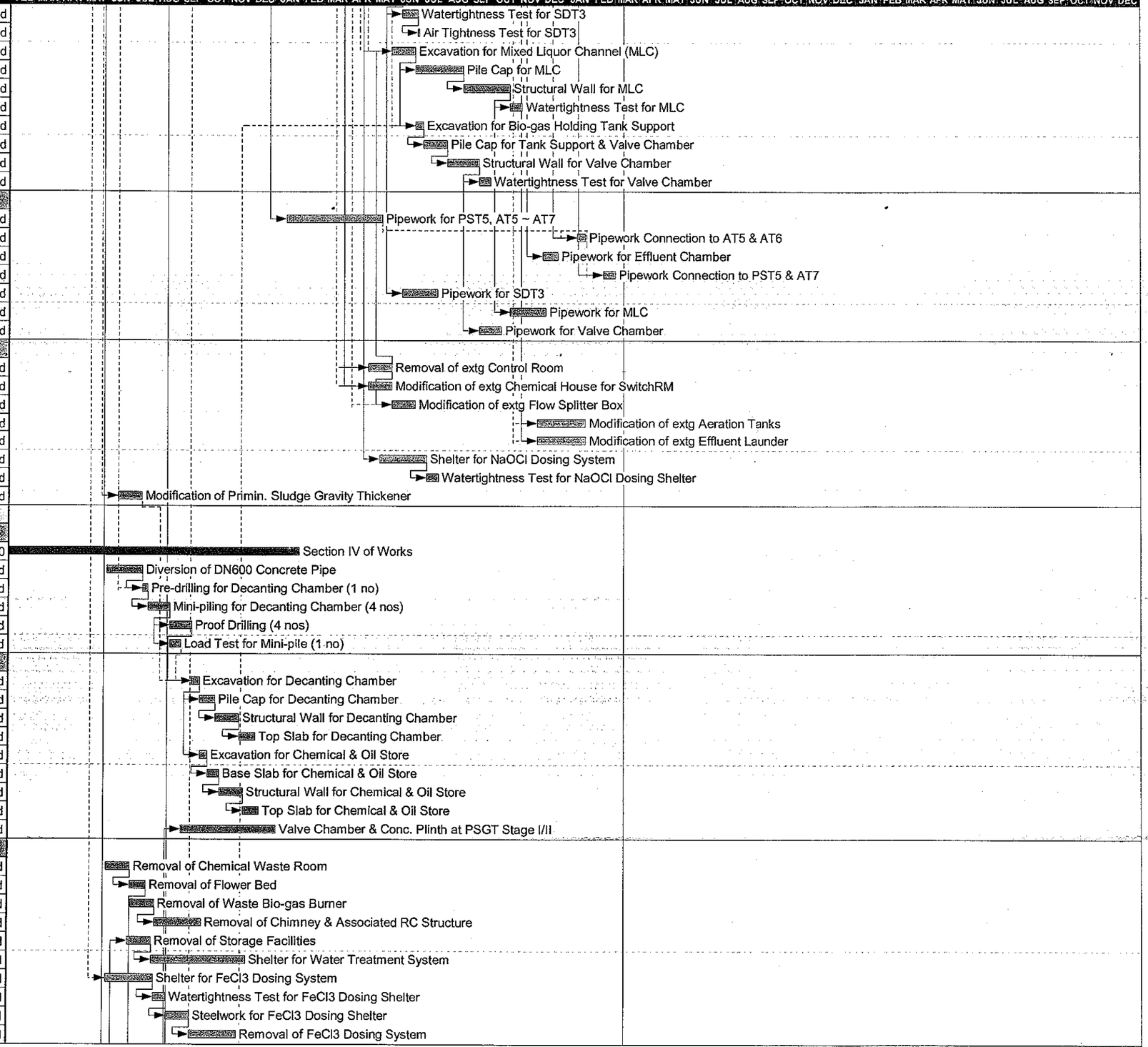
Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float
31220	Watertightness Test for SDT3	20	07JUN11	26JUN11	248d
31230	Air Tightness Test for SDT3	2	27JUN11	28JUN11	248d
31240	Excavation for Mixed Liquor Channel (MLC)	30	25MAY11	23JUN11	88d
31250	Pile Cap for MLC	60	24JUN11	22AUG11	88d
31260	Structural Wall for MLC	60	23AUG11	21OCT11	88d
31265	Watertightness Test for MLC	15	22OCT11	05NOV11	118d
31270	Excavation for Bio-gas Holding Tank Support	10	24JUN11	03JUL11	144d
31280	Pile Cap for Tank Support & Valve Chamber	30	04JUL11	02AUG11	144d
31290	Structural Wall for Valve Chamber	40	03AUG11	11SEP11	144d
31300	Watertightness Test for Valve Chamber	15	12SEP11	26SEP11	158d
Pipeline Works					
32005	Pipework for PST5, AT5 ~ AT7	120	13JAN11	12MAY11	280d
32010	Pipework Connection to AT5 & AT6	10	14JAN12	23JAN12	39d
32020	Pipework for Effluent Chamber	19	02DEC11	20DEC11	73d
32030	Pipework Connection to PST5 & AT7	15	15FEB12	29FEB12	2d
32040	Pipework for SDT3	45	07JUN11	21JUL11	225d
32060	Pipework for MLC	45	22OCT11	05DEC11	88d
32070	Pipework for Valve Chamber	29	12SEP11	10OCT11	144d
Modification / Removal Works					
33010	Removal of extg Control Room	30	25APR11	24MAY11	88d
33020	Modification of extg Chemical House for SwitchRM	30	25APR11	24MAY11	283d
33030	Modification of extg Flow Splitter Box	30	25MAY11	23JUN11	253d
33040	Modification of extg Aeration Tanks	60	25NOV11	23JAN12	39d
33050	Modification of extg Effluent Launder	60	25NOV11	23JAN12	39d
33060	Shelter for NaOCl Dosing System	60	09MAY11	07JUL11	224d
33070	Watertightness Test for NaOCl Dosing Shelter	15	08JUL11	22JUL11	224d
33080	Modification of Primin. Sludge Gravity Thickener	30	15JUN10 *	14JUL10	113d
Section IV of Works					
Drilling Works					
40010	Section IV of Works	365	29JAN10	28JAN11	0
40015	Diversion of DN600 Concrete Pipe	45	01JUN10 *	15JUL10	49d
40110	Pre-drilling for Decanting Chamber (1 no)	7	16JUL10	22JUL10	49d
40120	Mini-piling for Decanting Chamber (4 nos)	28	23JUL10	19AUG10	49d
40130	Proof Drilling (4 nos)	28	20AUG10	16SEP10	49d
40140	Load Test for Mini-pile (1 no)	14	20AUG10	02SEP10	63d
Structural Works					
41010	Excavation for Decanting Chamber	10	17SEP10	26SEP10	49d
41020	Pile Cap for Decanting Chamber	20	27SEP10	16OCT10	54d
41030	Structural Wall for Decanting Chamber	30	17OCT10	15NOV10	54d
41040	Top Slab for Decanting Chamber	20	16NOV10	05DEC10	54d
41050	Excavation for Chemical & Oil Store	10	27SEP10	06OCT10	49d
41060	Base Slab for Chemical & Oil Store	15	07OCT10	21OCT10	49d
41070	Structural Wall for Chemical & Oil Store	30	22OCT10	20NOV10	49d
41080	Top Slab for Chemical & Oil Store	20	21NOV10	10DEC10	49d
41090	Valve Chamber & Conc. Plinth at PSGT Stage I/II	120	03SEP10	31DEC10	28d
Modification / Removal Works					
43010	Removal of Chemical Waste Room	30	01JUN10 *	30JUN10	362d
43020	Removal of Flower Bed	20	01JUL10	20JUL10	362d
43025	Removal of Waste Bio-gas Burner	30	02JUL10 *	31JUL10	121d
43030	Removal of Chimney & Associated RC Structure	60	01AUG10	29SEP10	121d
43040	Removal of Storage Facilities	30	28JUN10	27JUL10	65d
43050	Shelter for Water Treatment System	120	28JUL10	24NOV10	65d
43070	Shelter for FeCl3 Dosing System	60	01JUN10 *	30JUL10	76d
43080	Watertightness Test for FeCl3 Dosing Shelter	16	31JUL10	15AUG10	76d
43090	Steelwork for FeCl3 Dosing Shelter	30	16AUG10	14SEP10	76d
43100	Removal of FeCl3 Dosing System	60	15SEP10	13NOV10	76d



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TPSTW Stage 5 Phase 2B

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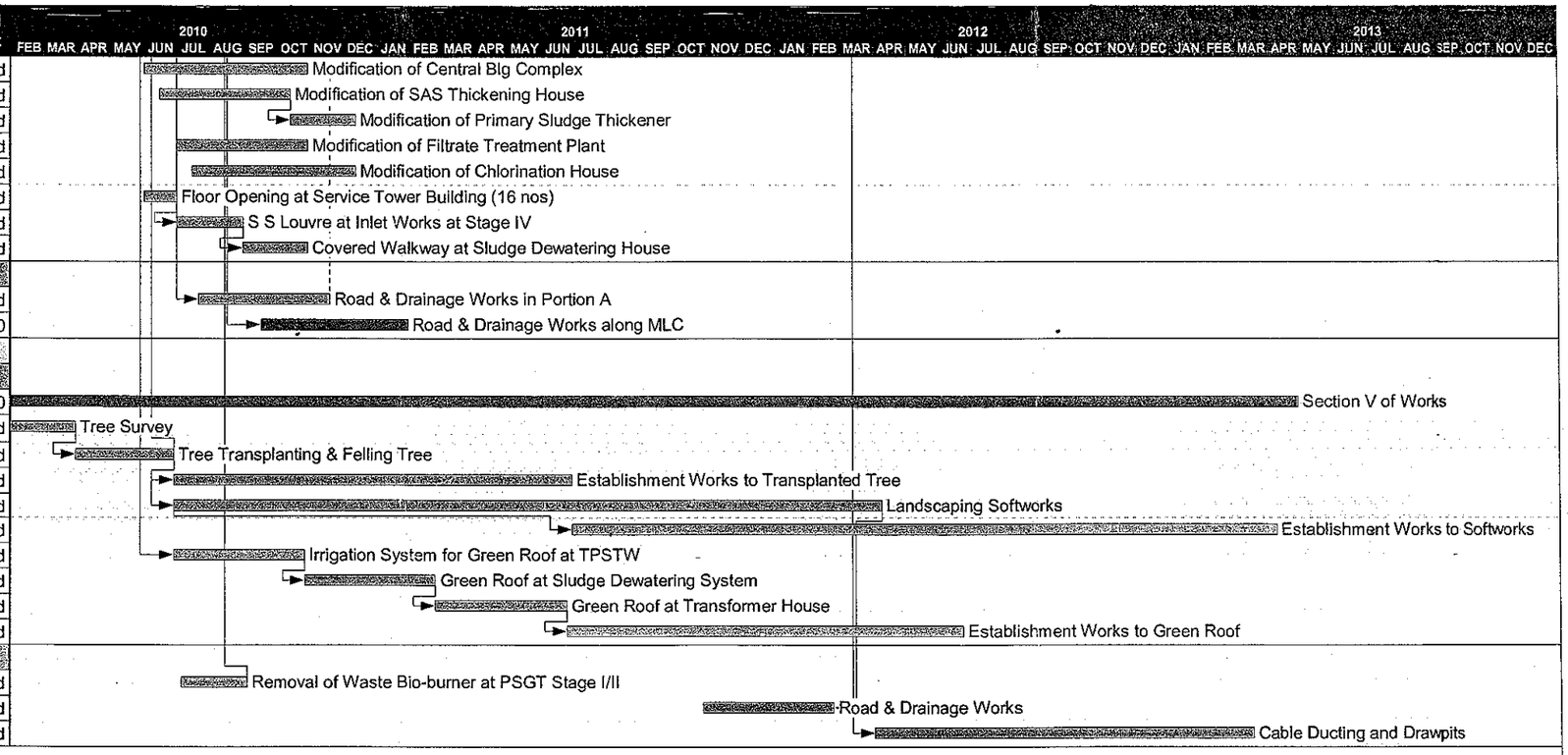
Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float
43110	Modification of Central Blg Complex	150	01JUN10 *	28OCT10	92d
43120	Modification of SAS Thickening House	120	15JUN10 *	12OCT10	48d
43130	Modification of Primary Sludge Thickener	60	13OCT10	11DEC10	48d
43140	Modification of Filtrate Treatment Plant	120	01JUL10 *	28OCT10	92d
43150	Modification of Chlorination House	150	15JUL10 *	11DEC10	48d
43160	Floor Opening at Service Tower Building (16 nos)	30	01JUN10 *	30JUN10	92d
43165	S S Louvre at Inlet Works at Stage IV	60	01JUL10	29AUG10	92d
43170	Covered Walkway at Sludge Dewatering House	60	30AUG10	28OCT10	92d
Road & Draqinage Works					
42010	Road & Drainage Works in Portion A	120	21JUL10	17NOV10	362d
42020	Road & Drainage Works along MLC	135	16SEP10	28JAN11	0
Section V of Works					
Landscaping Works					
50010	Section V of Works	1185	29JAN10	27APR13	0
50110	Tree Survey	60	29JAN10	29MAR10	20d
50120	Tree Transplanting & Felling Tree	90	30MAR10	27JUN10	20d
50130	Establishment Works to Transplanted Tree	365	28JUN10	27JUN11	670d
50140	Landscaping Softworks	650	28JUN10	07APR12	20d
50150	Establishment Works to Softworks	650	28JUN11	07APR13	20d
50160	Irrigation System for Green Roof at TPSTW	120	28JUN10	25OCT10	310d
50170	Green Roof at Sludge Dewatering System	120	26OCT10	22FEB11	310d
50180	Green Roof at Transformer House	120	23FEB11	22JUN11	310d
50190	Establishment Works to Green Roof	365	23JUN11	21JUN12	310d
Others					
51010	Removal of Waste Bio-burner at PSGT Stage I/II	60	05JUL10 *	02SEP10	28d
51020	Road & Drainage Works	120	26OCT11	22FEB12	430d
51030	Cable Ducting and Drawpits	350	01APR12	16MAR13	42d



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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	• NM1 (Outside the corridor of 1/F of Government Staff Quarter)
Air	1-hour TSP	3 times every six days	1 hour	• CAM1 (on flat roof of Government Staff Quarters) • 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.)
	24-hour TSP	Once every six days	24 hours	
Landfill Gas	Methane (v/v) Carbon Dioxide (v/v) Oxygen (v/v)	2 times per day	N/A	<u>The Locations where the excavation is 1m depth or more and within the 250m Consultation Zone of Shuen Wan Landfill</u> • FC11B and FC12B (Conducted in April and May 2011 only) • Aeration Tank • Dewatering House (Conducted in April and May 2011 only) • FC7B (Conducted in June 2011 only) • FC8B (Conducted in June 2011 only)

(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, µg/m^3	Limit Level, µg/m^3
CAM1	315	500
CAM2	336	
CAM3	344	

24-Hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/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)

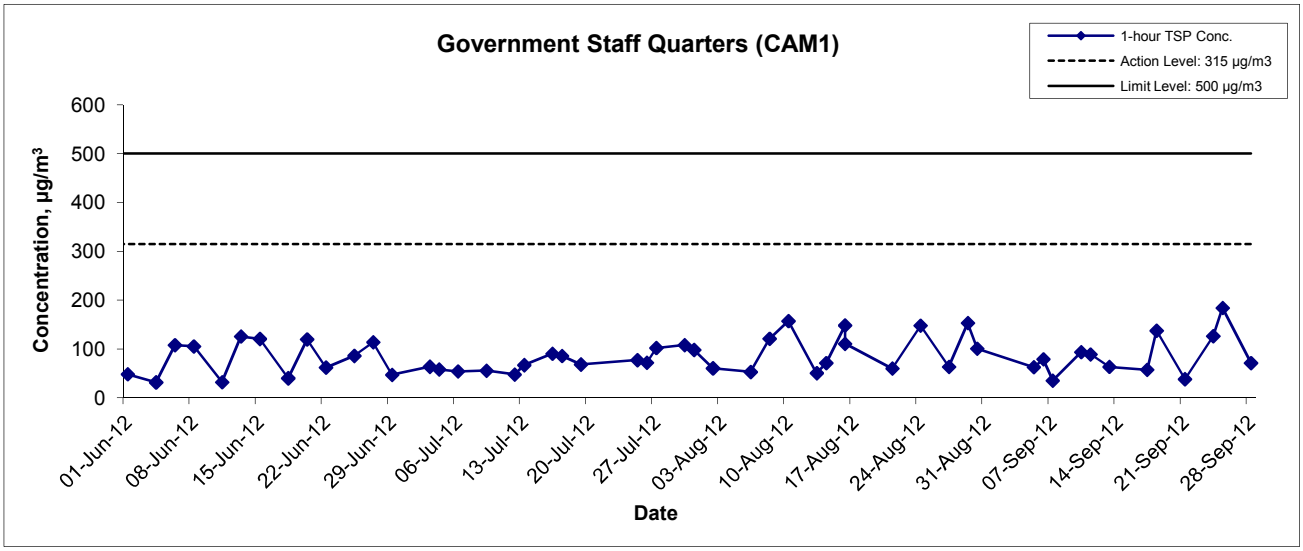
Notes:
* The Area Sensitivity Rating for Station NM1 is taken as C, due to the nearby industrial area, according to Table 1 of EPD's Technical Memorandum on Noise from Construction Work other than Percussive Piling.

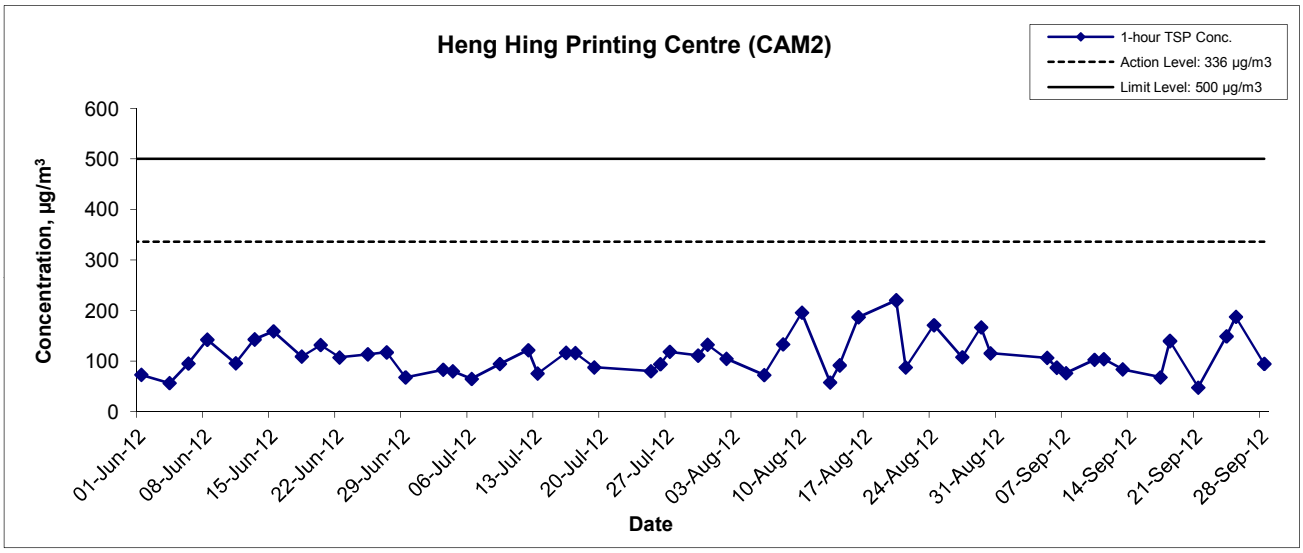
Landfill Gas

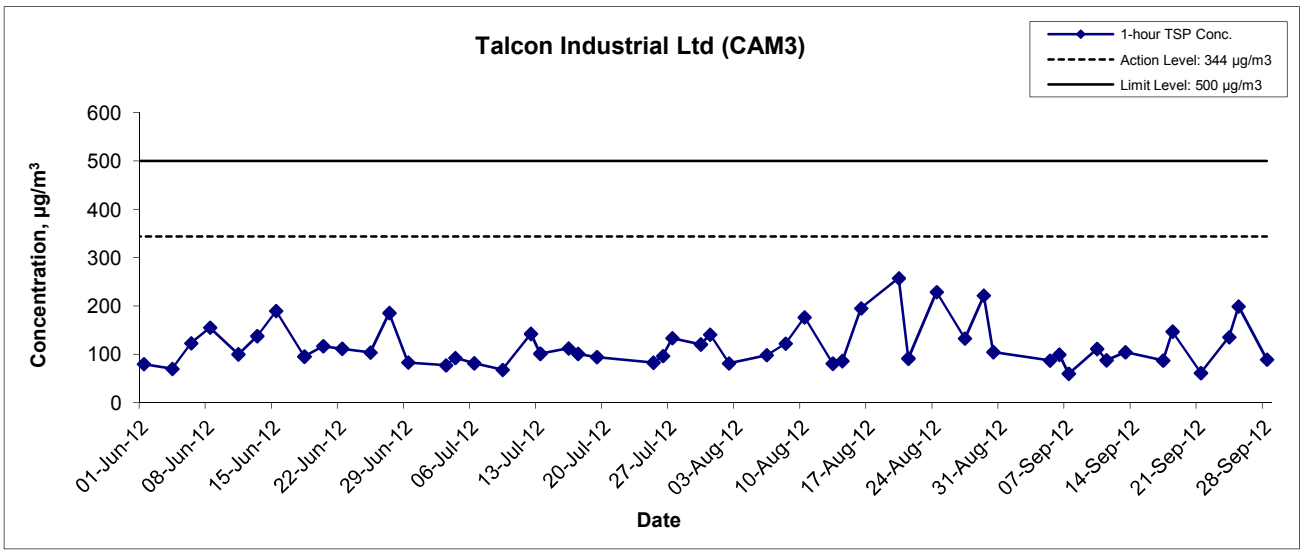
Parameter	Limit Level	Action
Oxygen	<19%	Ventilate to restore oxygen to >19%
	<18%	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. >0.5% by volume)	Post "No Smoking" signs Prohibit hot works Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. >1% by volume)	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore methane to <10%
Carbon Dioxide	>0.5%	Ventilate to restore carbon dioxide to <0.5%
	>1.5%	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore carbon dioxide to <0.5%

APPENDIX D
GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS

1-hr TSP Concentration Levels







Title	Scale	Project No.
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Graphical Presentation of 1-hour TSP Impact Monitoring Results	Date: Sep 12	Appendix: D

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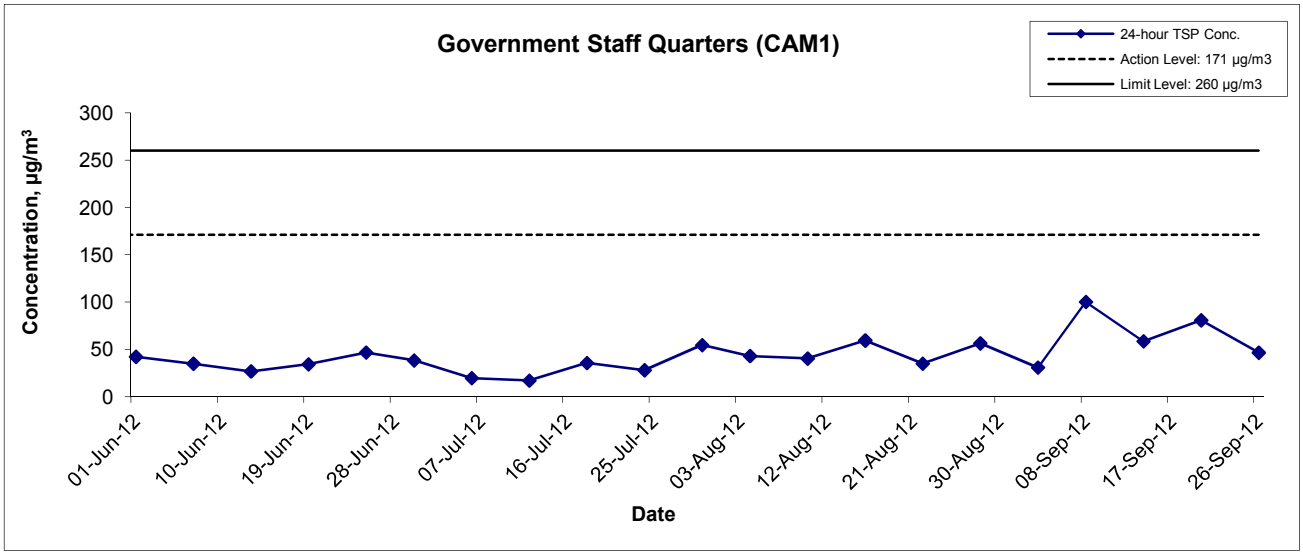
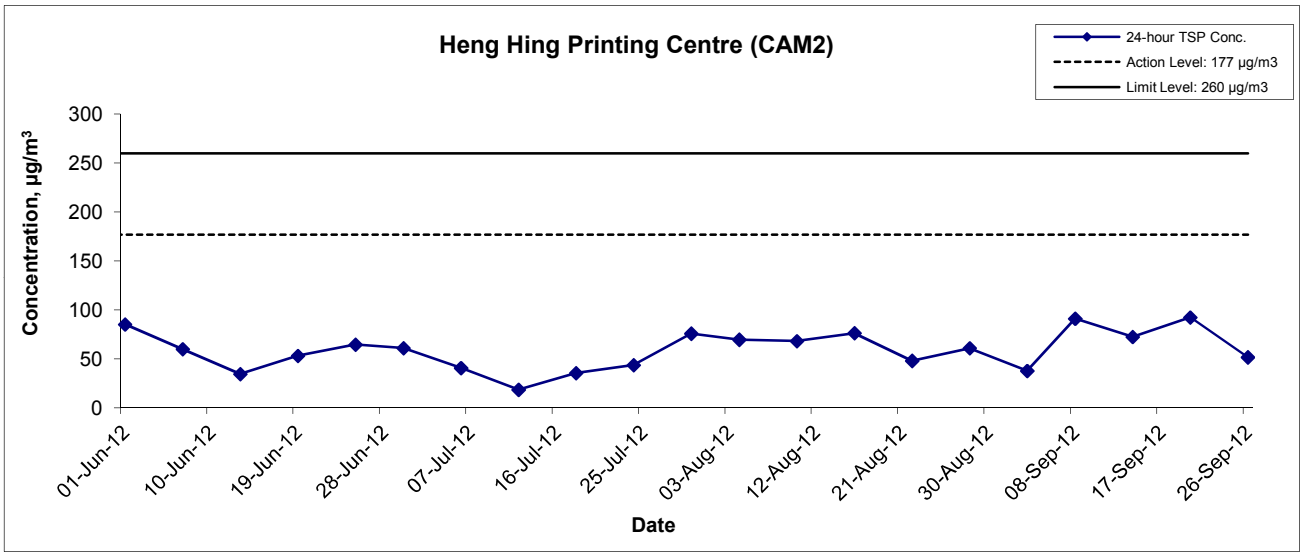
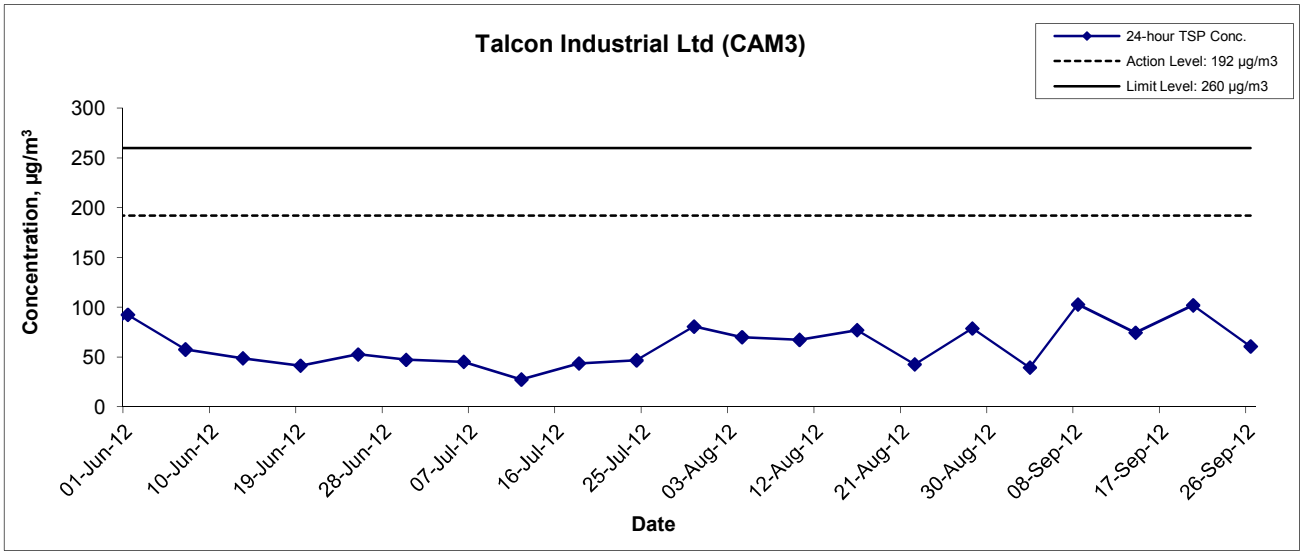
APPENDIX E
GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS

24-hr TSP Concentration Levels



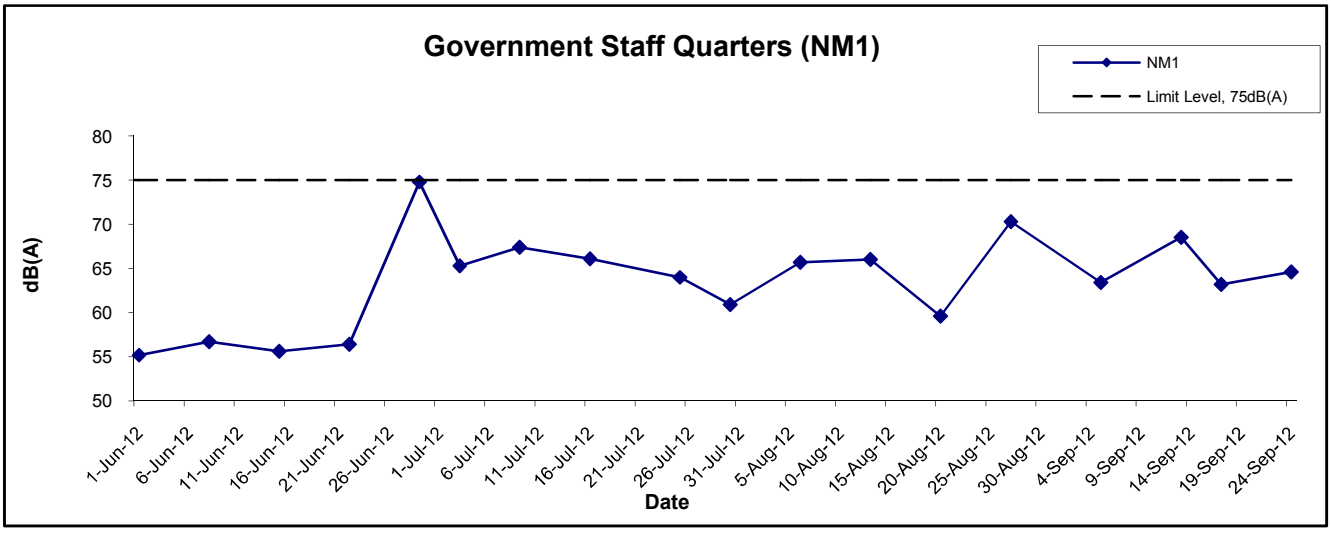




Title: Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of 24-hour TSP Impact Monitoring Results	Scale: N.T.S Date: Sep 12	Project No.: MA0010 Appendix: E	CINOTECH

APPENDIX F
GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS

Noise Levels



Title: Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S	Project No.: MA0010	CINOTECH
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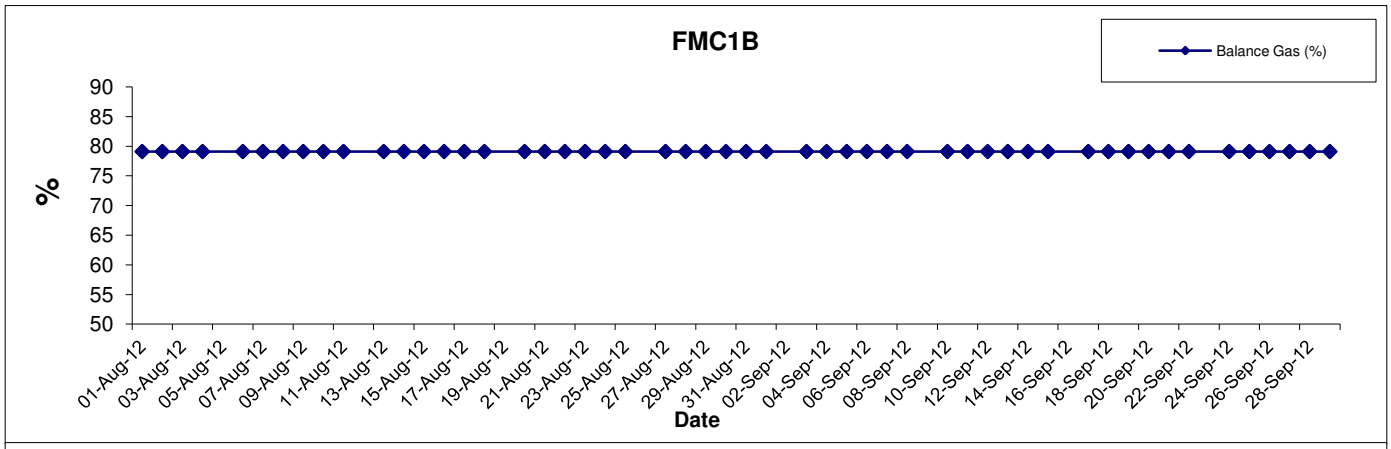
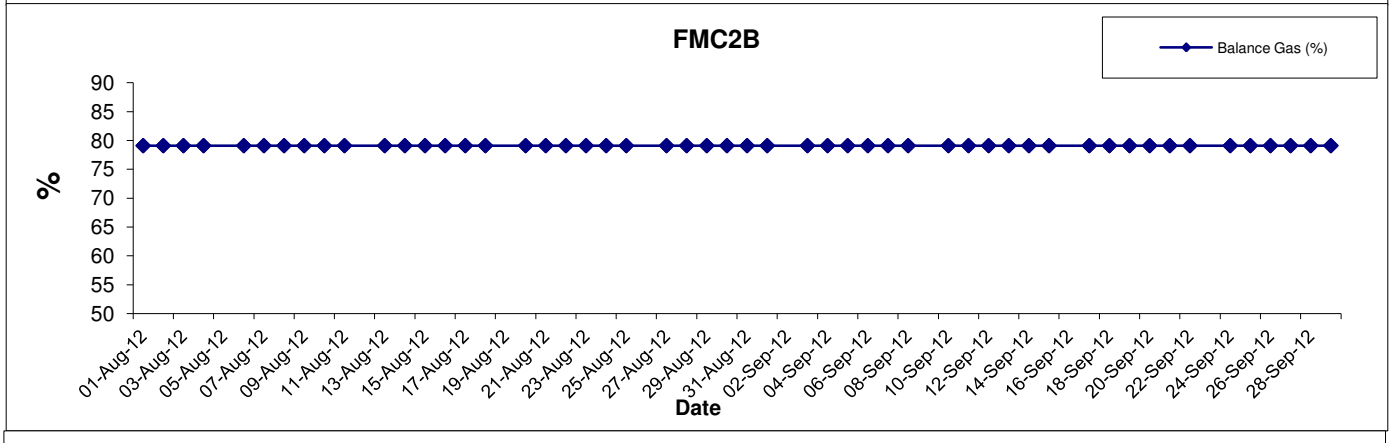
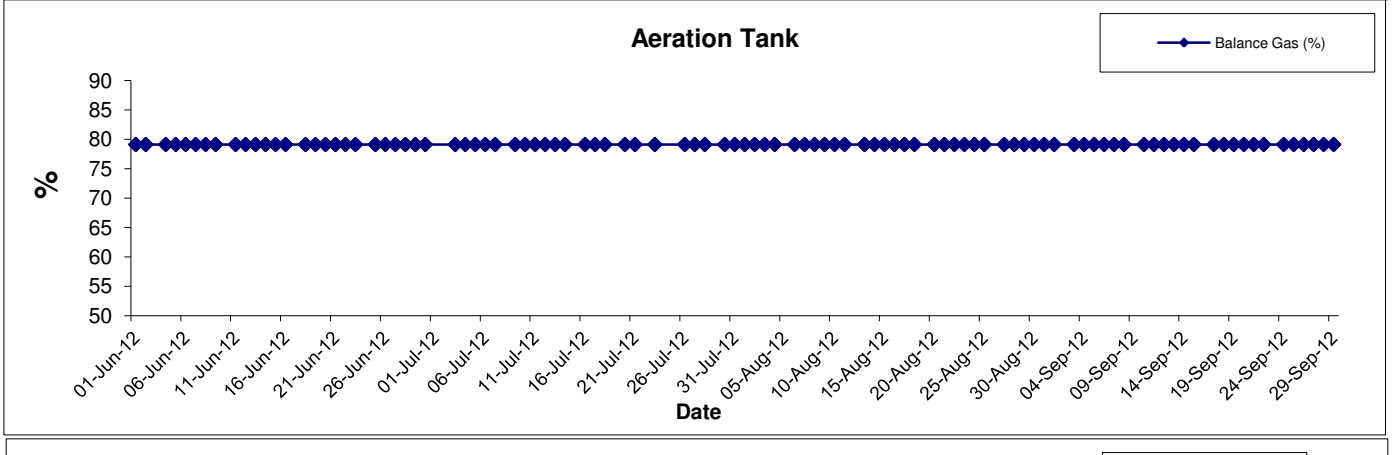
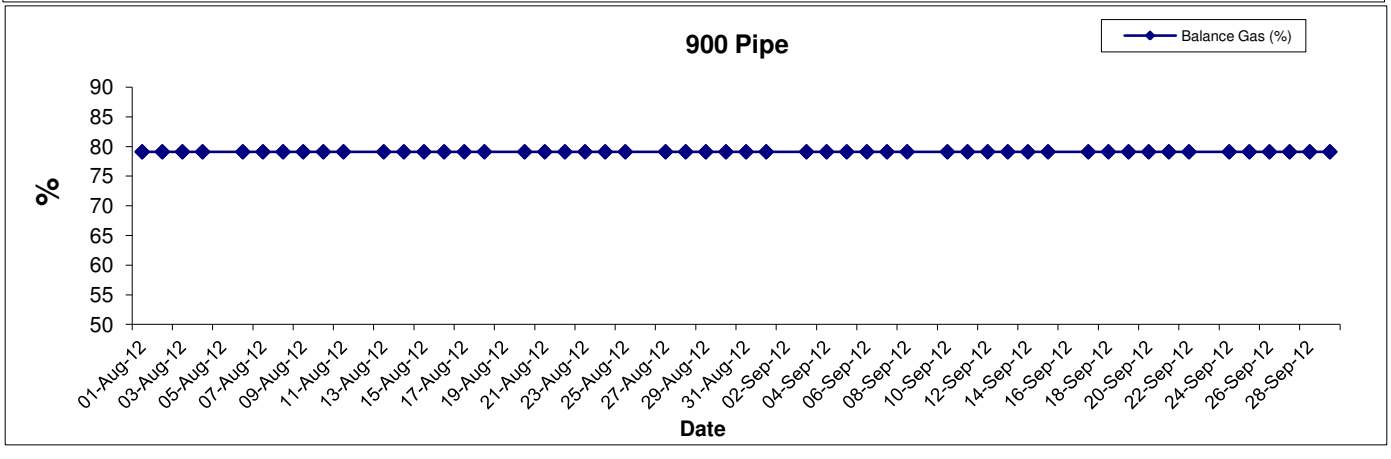
APPENDIX G
GRAPHICAL PRESENTATION OF LANDFILL GAS MEASUREMENT BY THE CONTRACTOR

Balance Gas









Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale N.T.S	Project No. MA0010	CINOTECH
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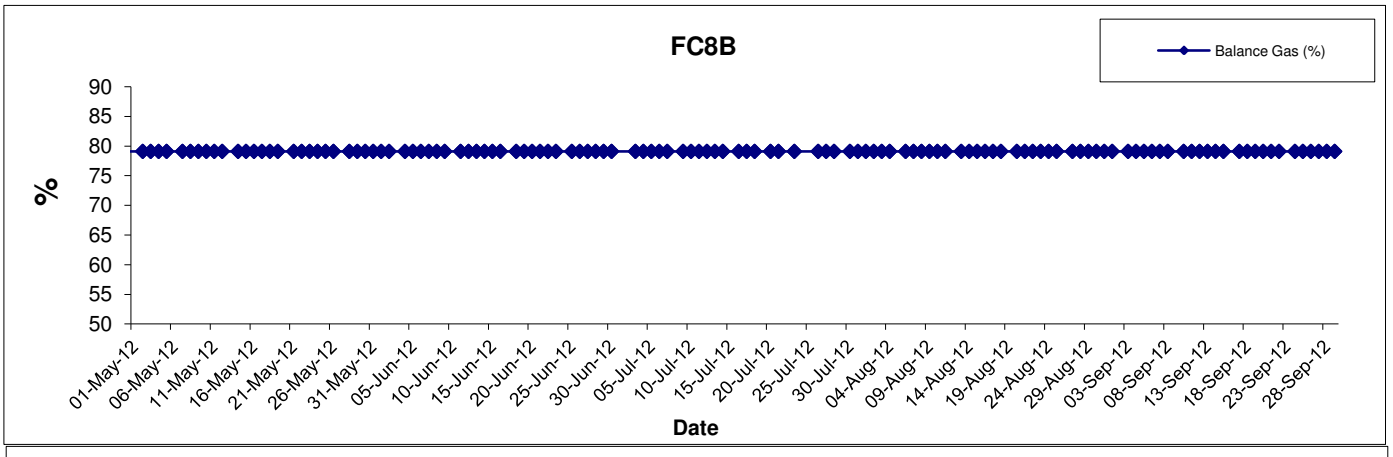
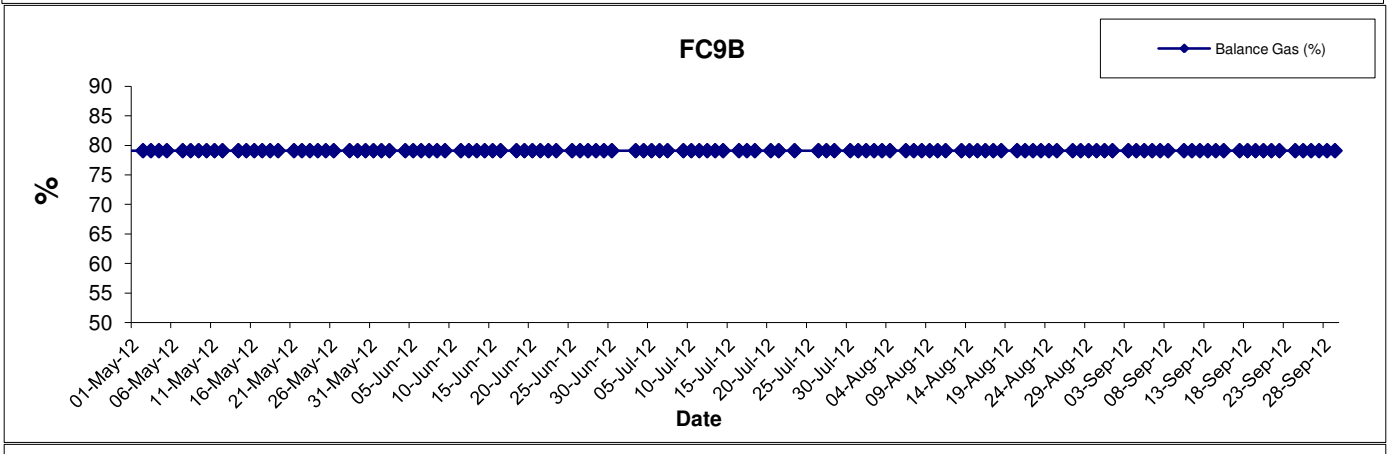
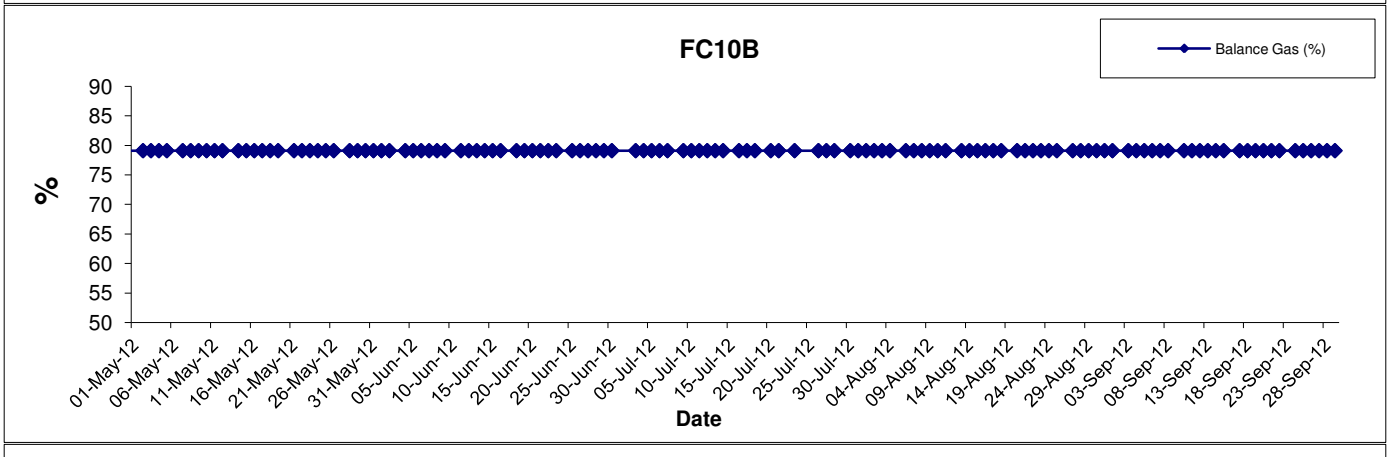
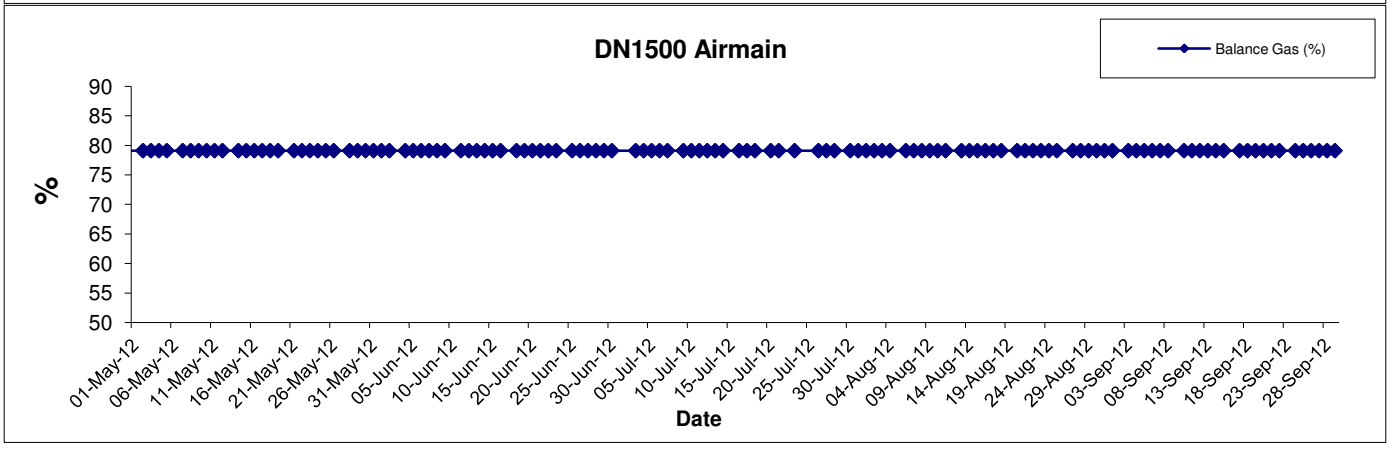
Balance Gas









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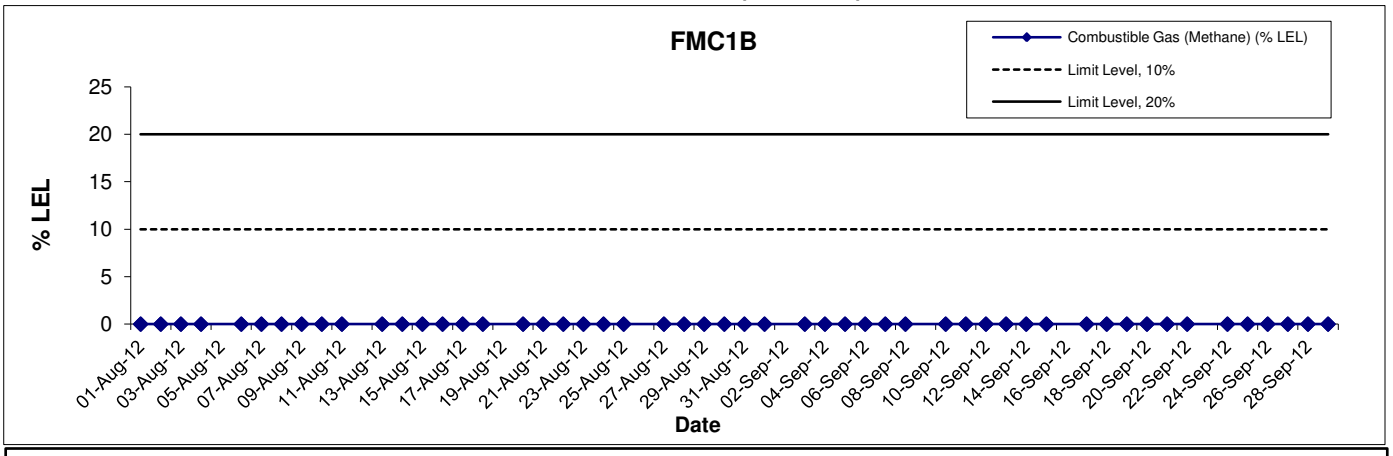
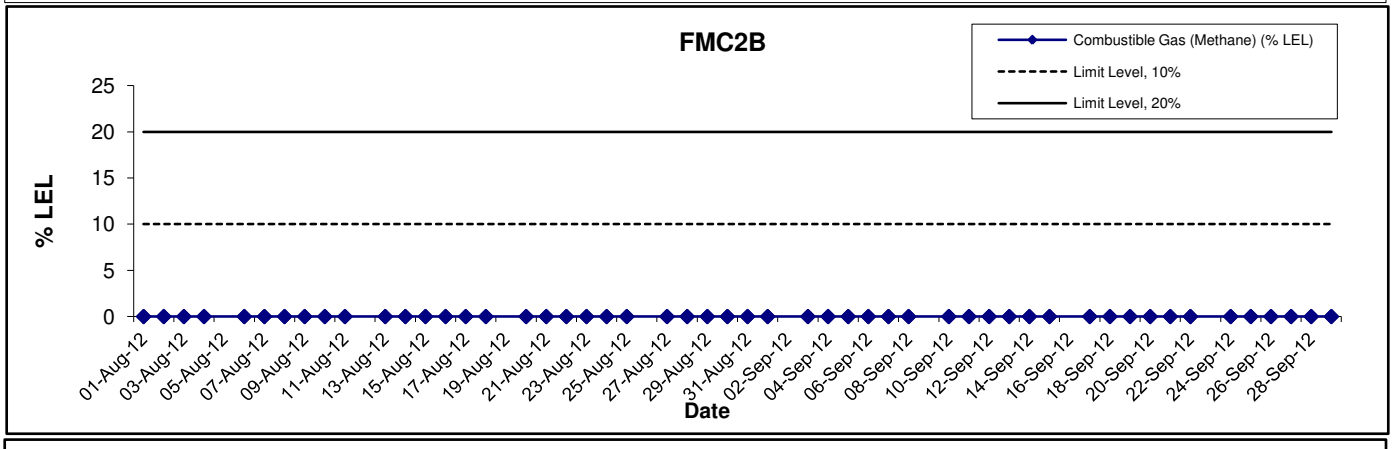
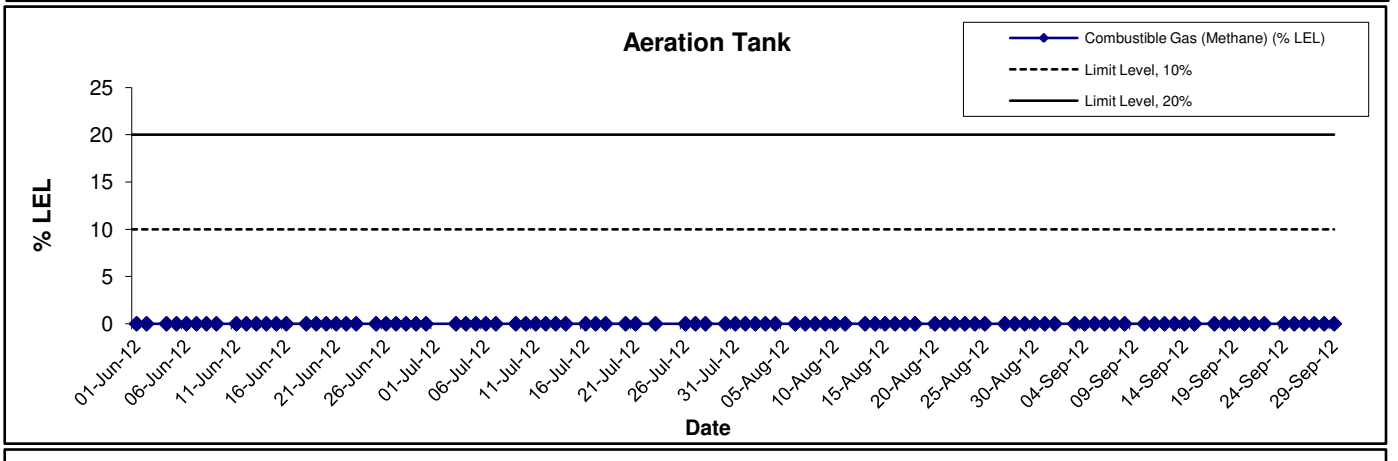
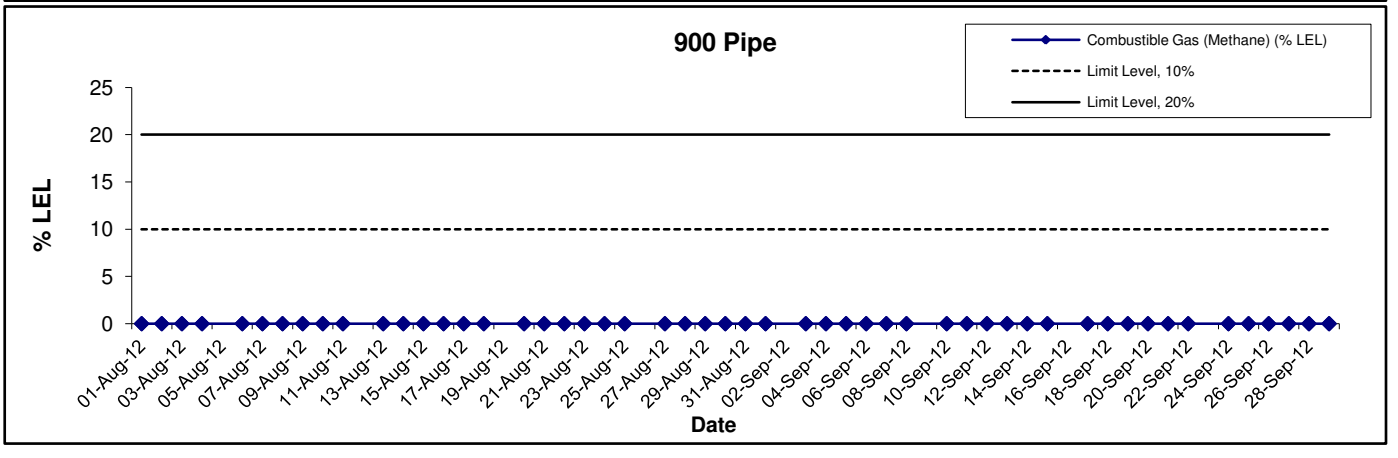
Combustible Gas (Methane)









Title Contract No. DC/2009/09 Construction of Tai Po Sewage Treatment Works - Stage V Phase II B Graphical Presentation of Landfill Gas Measurement	Scale N.T.S	Project No. MA0010	CINOTECH
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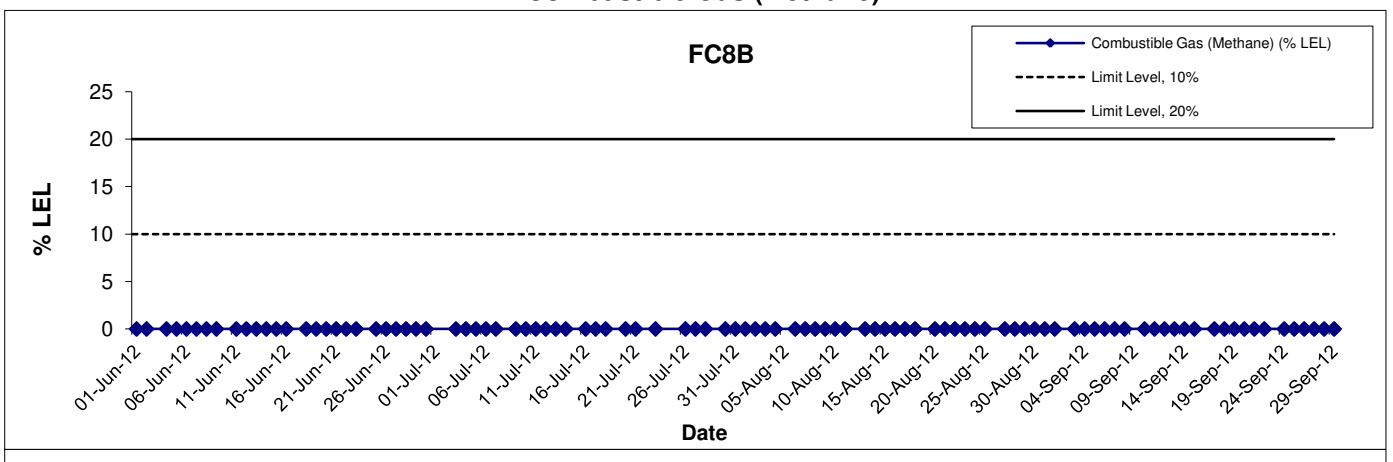
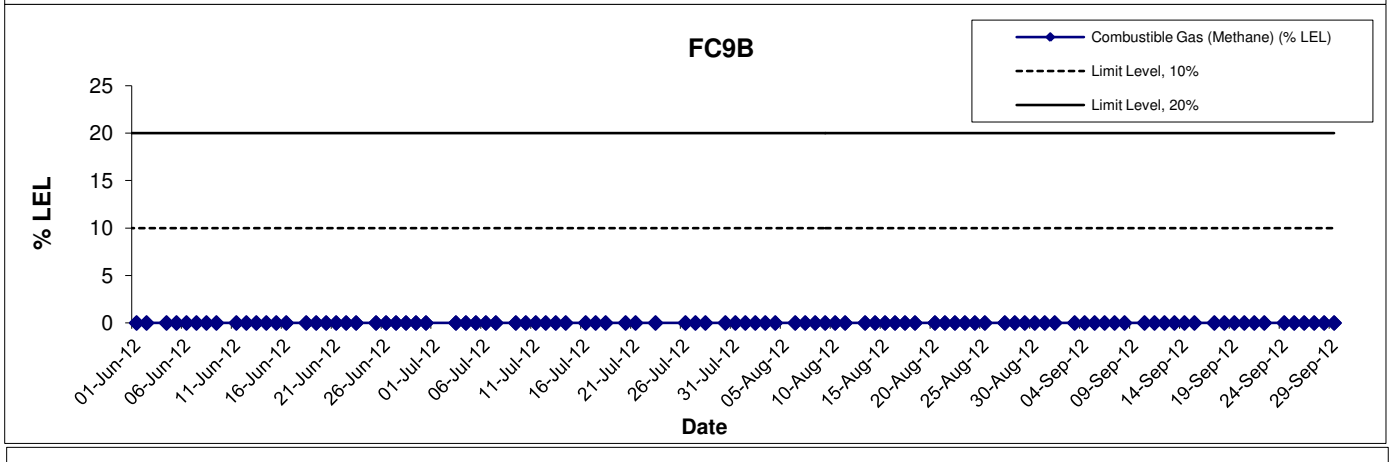
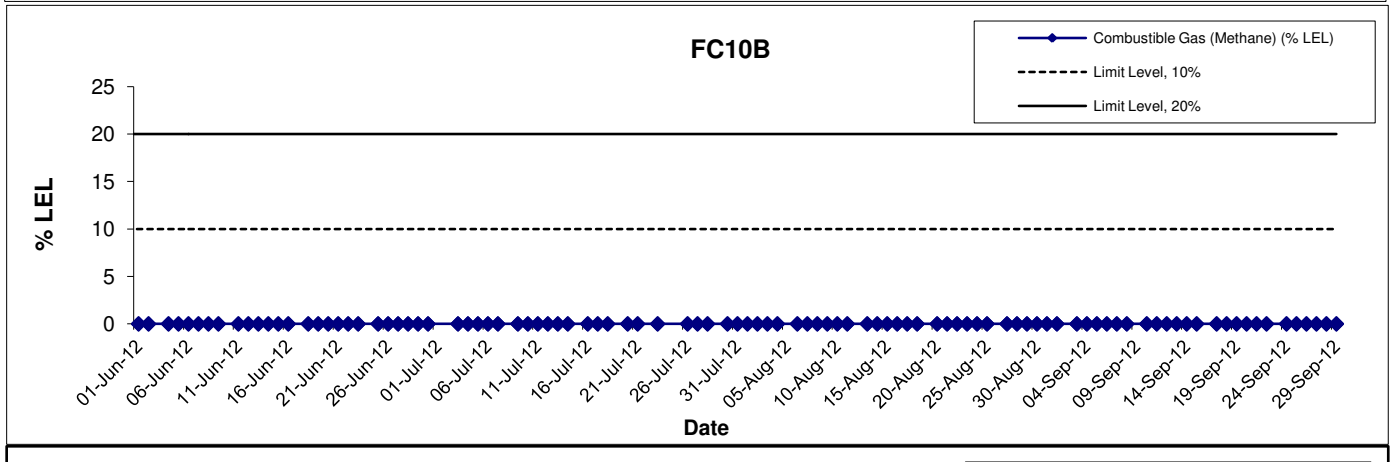
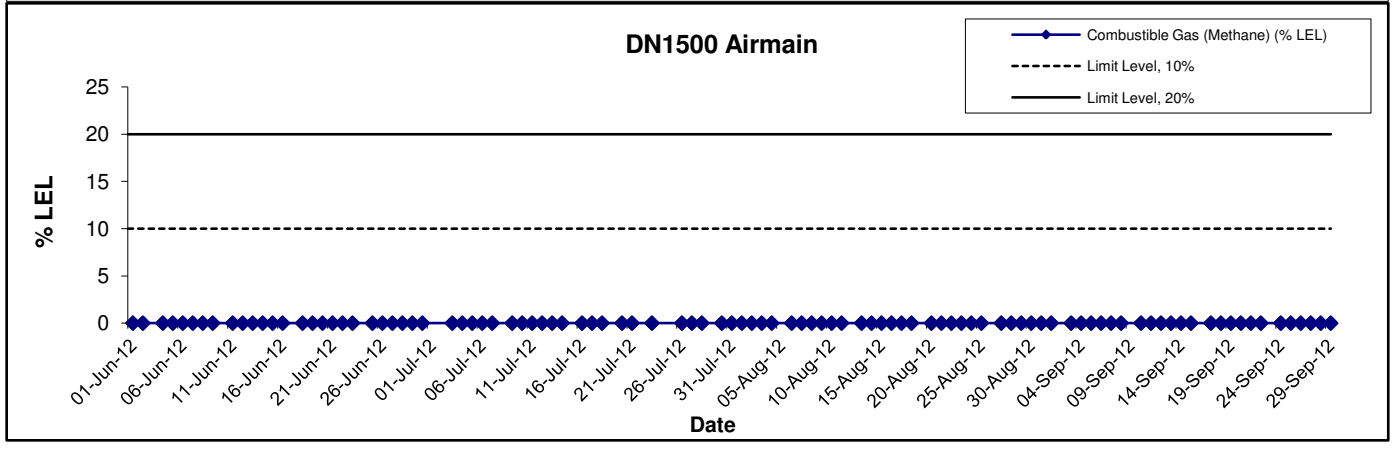
Combustible Gas (Methane)









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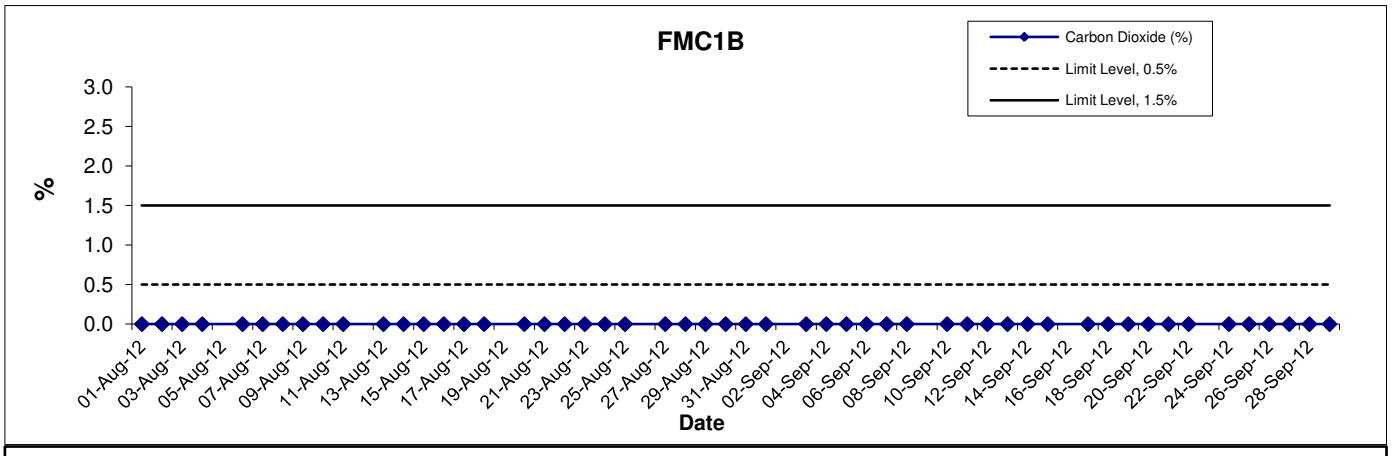
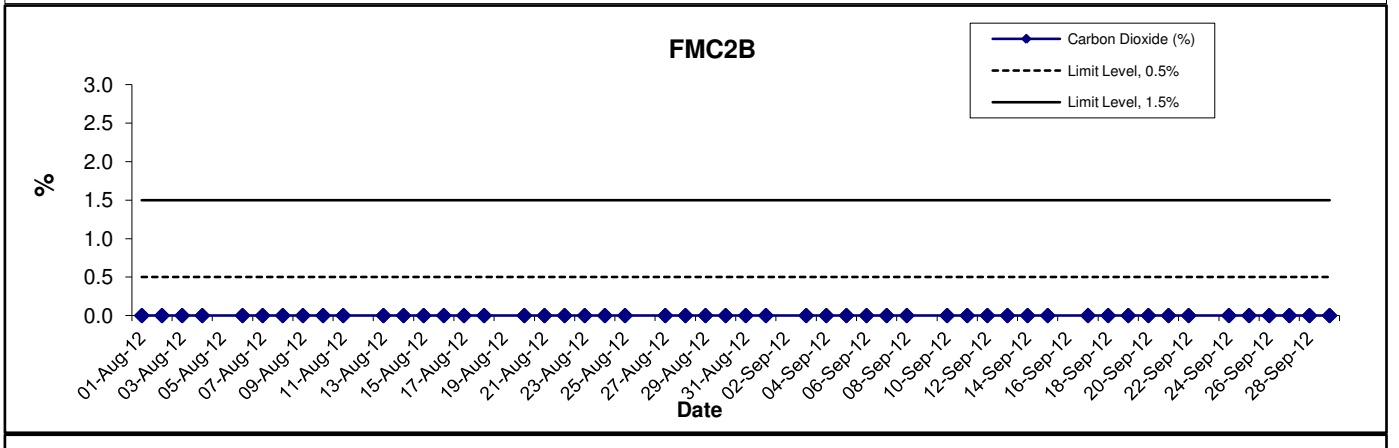
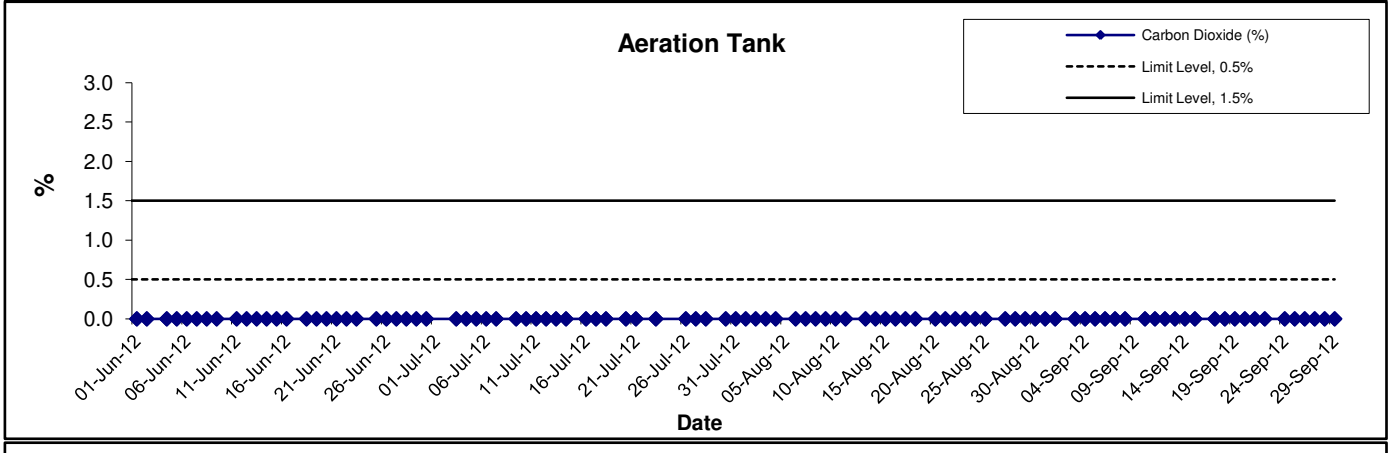
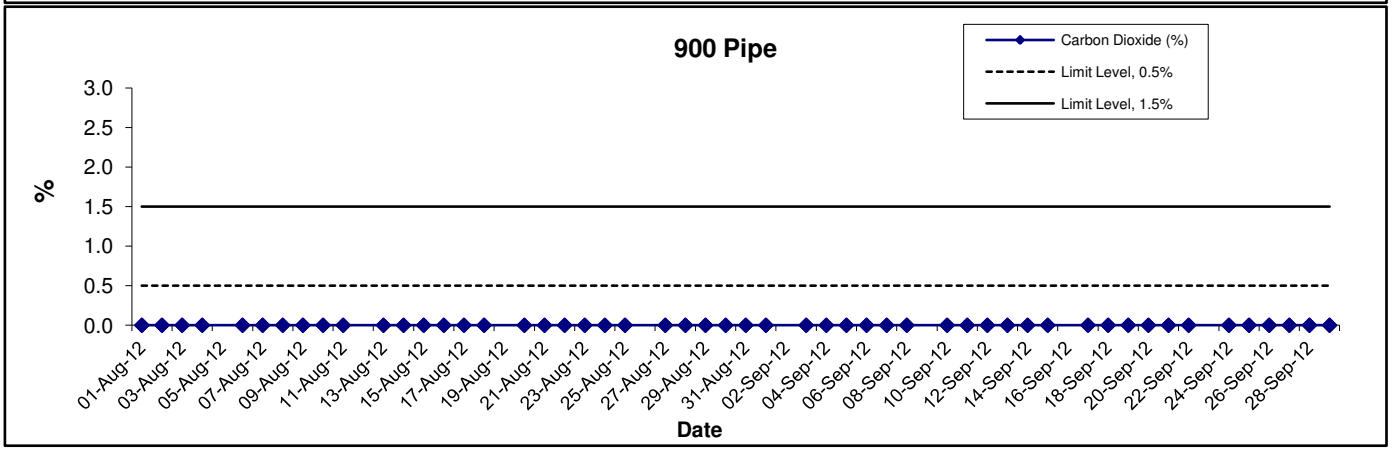
Carbon Dioxide









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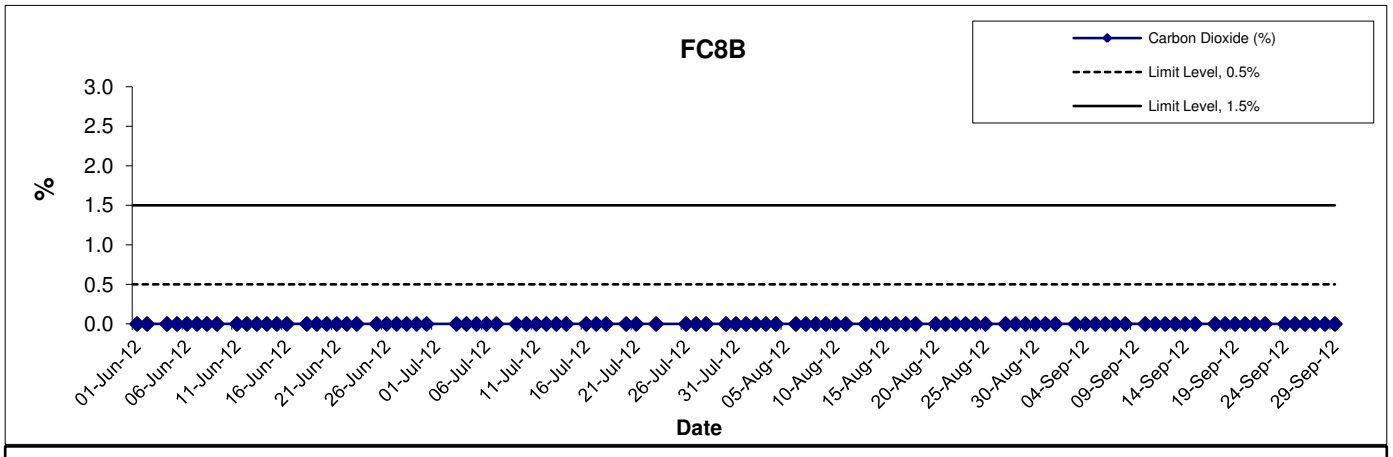
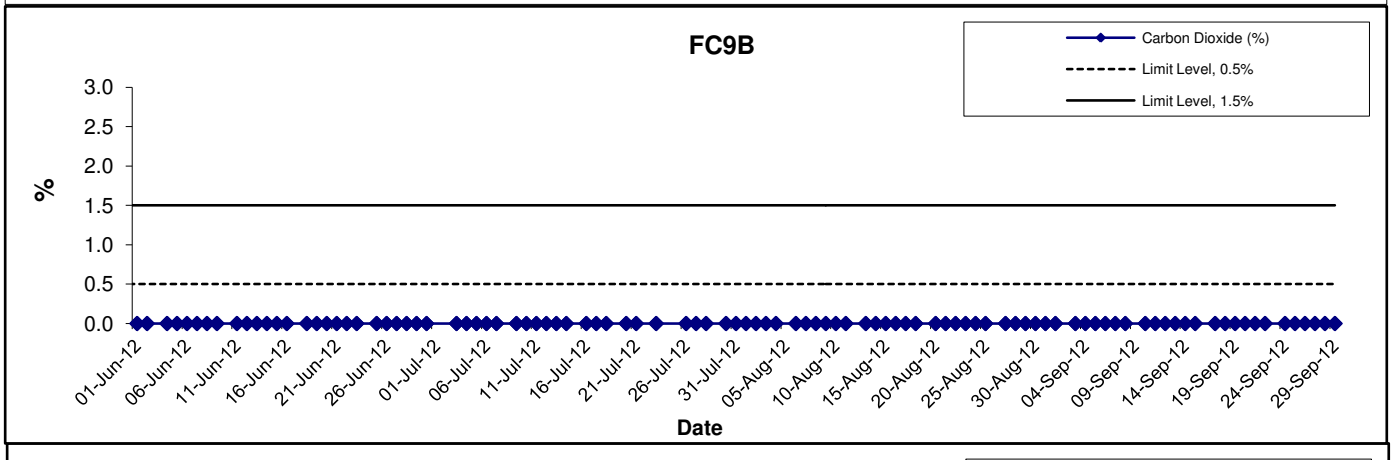
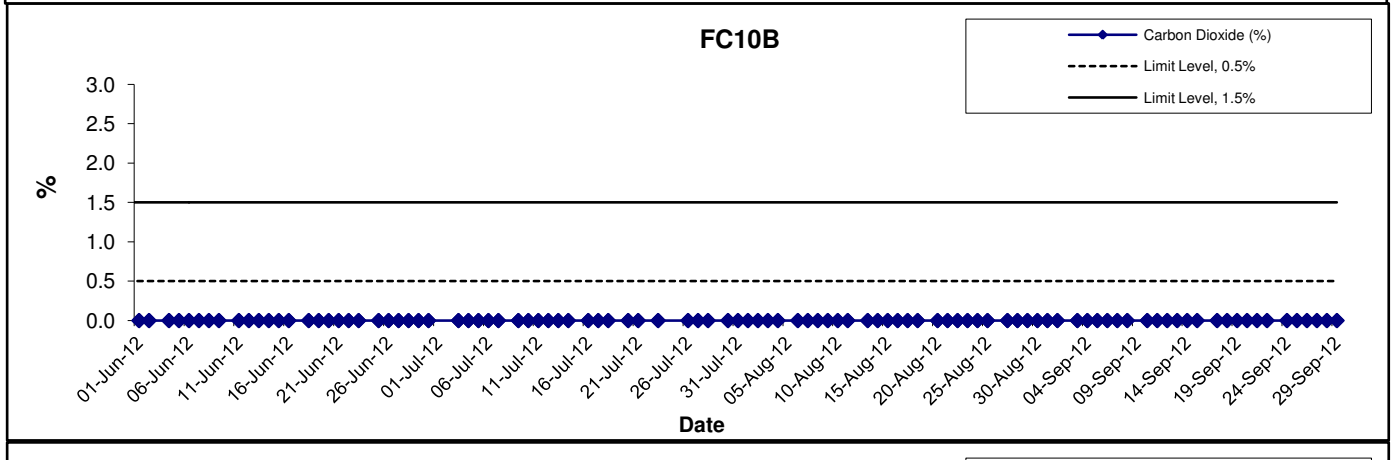
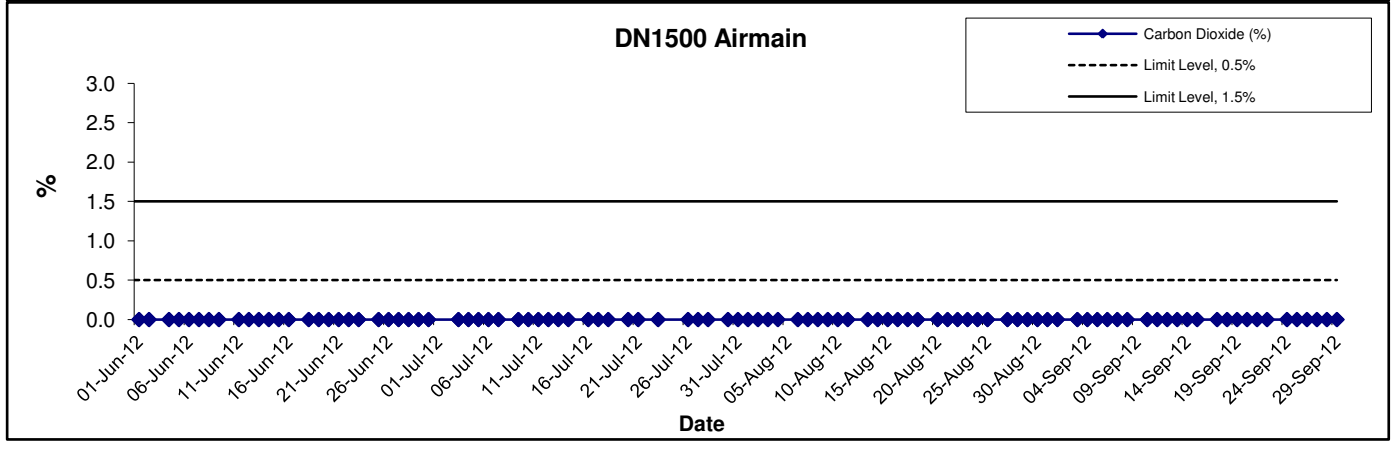
Carbon Dioxide









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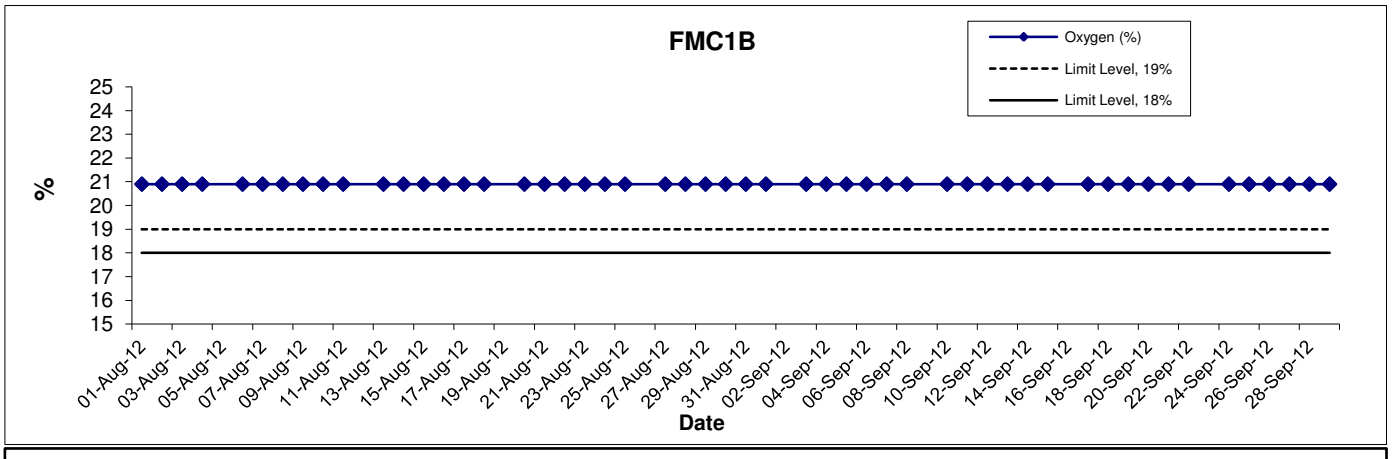
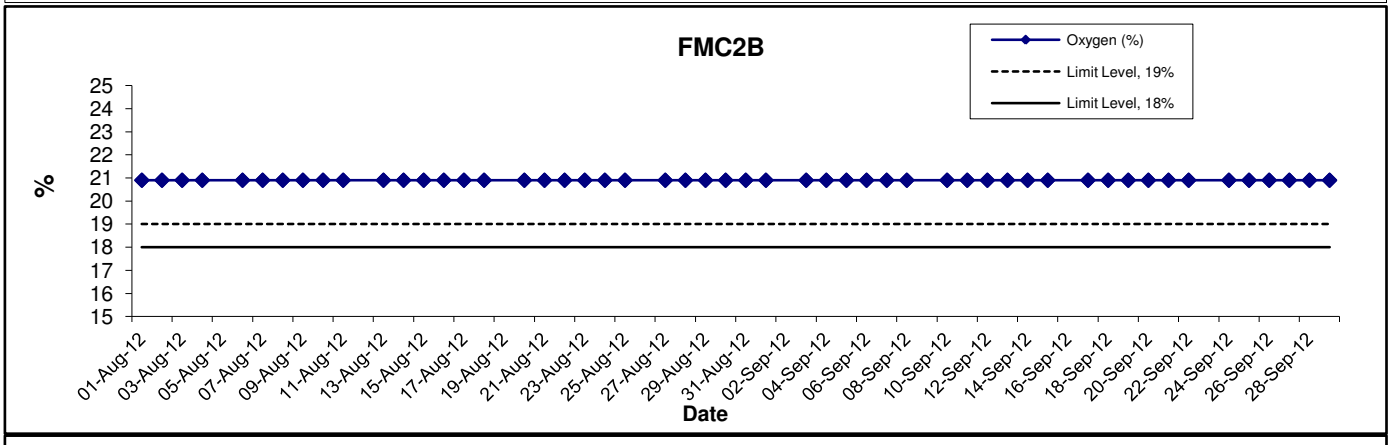
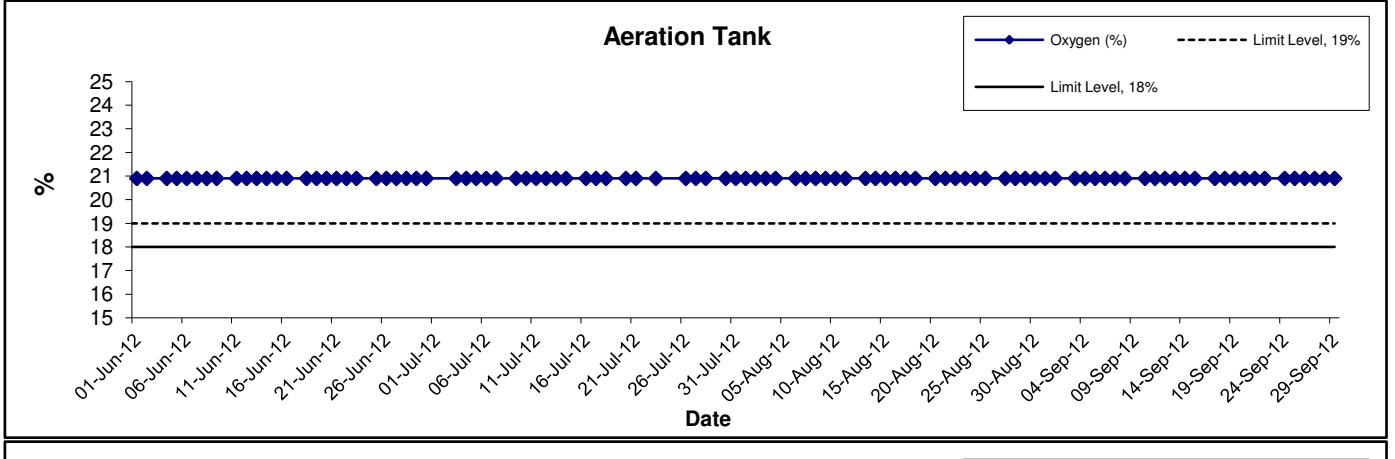
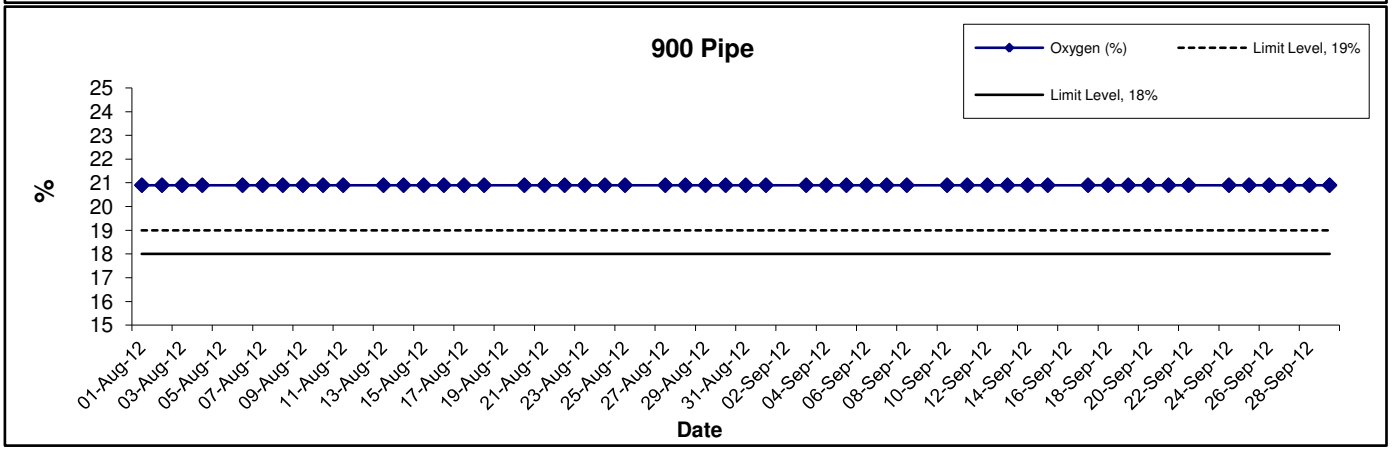
Oxygen









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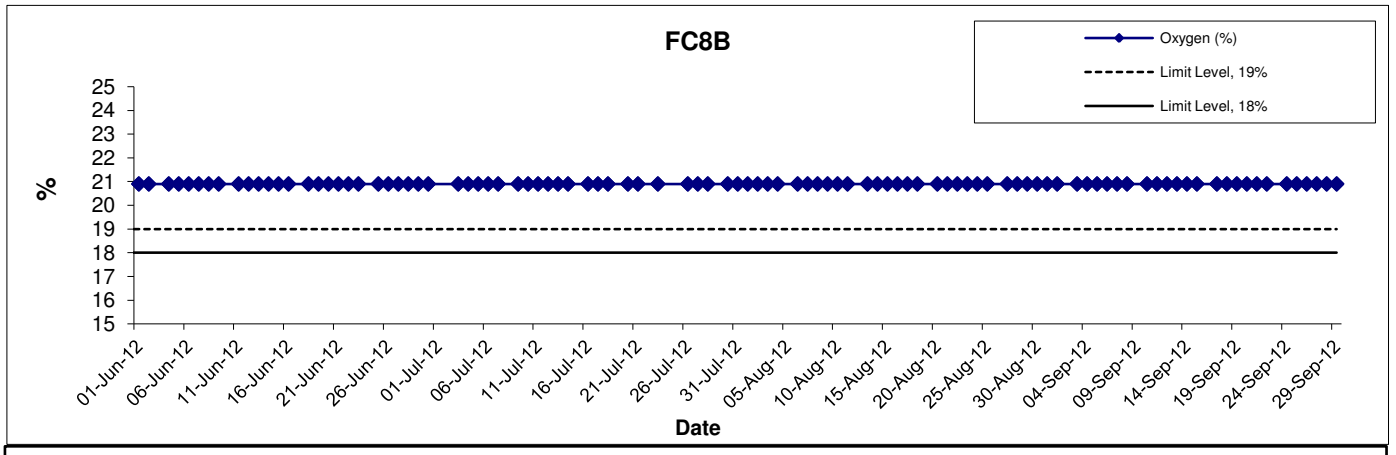
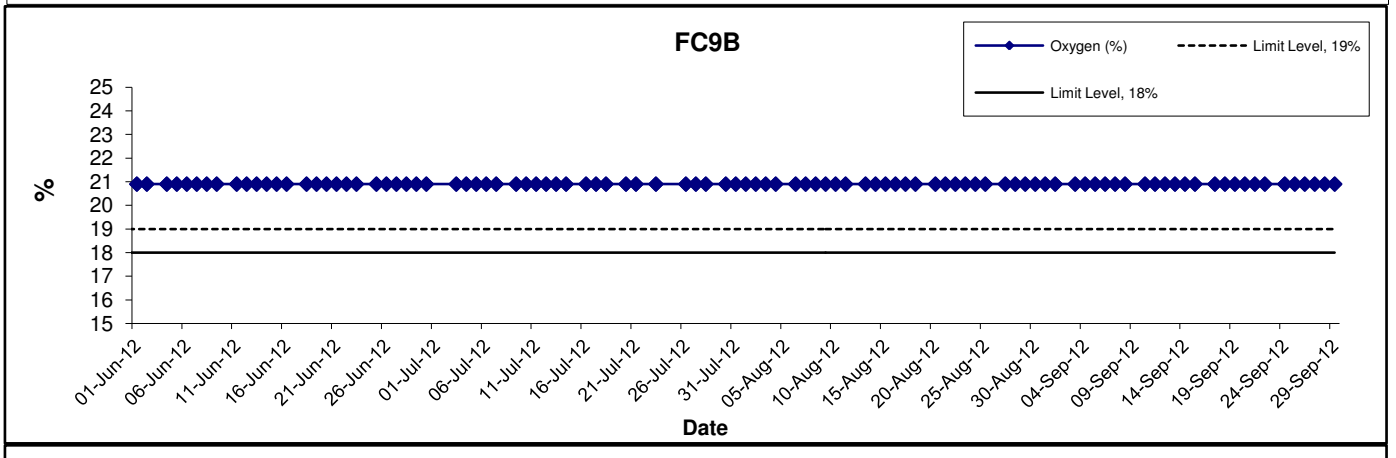
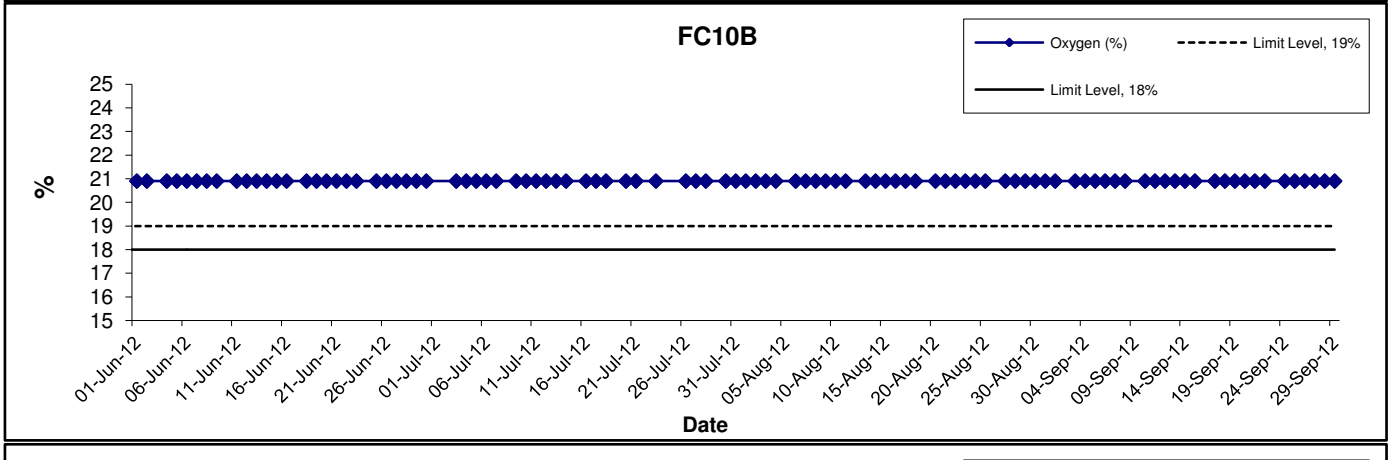
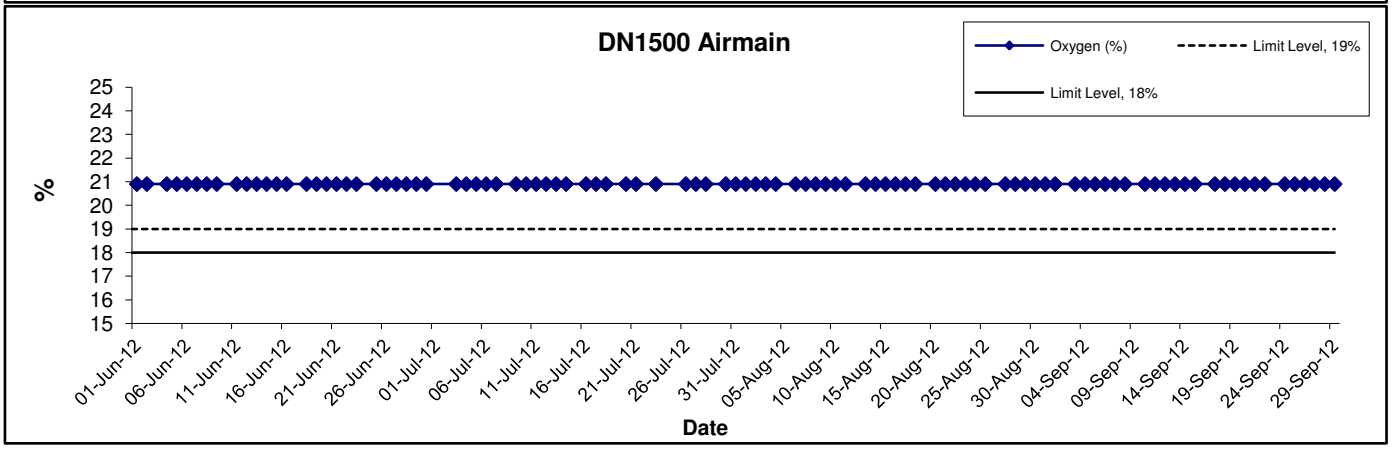
Graphical Presentation of Landfill Gas Measurement	Date: Sep 12	Appendix: G	

Oxygen









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APPENDIX H
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

APPENDIX H – 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 • 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.	√
	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.	√
	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport • Chemical waste containers should be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	√
	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	Good site practices during the construction activities include: • 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.	√
	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: • 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	√
	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.	√
	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.	√

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
Landfill Gas Hazard	All personnel who work on the site and all visitors to the site should be aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices should be displayed at prominent position around the site. Adequate fire extinguisher equipment and fire resistant clothing should be made available on site.	√
	Service runs within the consultation zone should be designated as "special routes" and utilities companies should be informed of this and should implement precautionary measures.	√
	Precautionary measures to minimize landfill gas hazard during excavation: • No smoking or burning shall be allowed • No worker shall work alone at any time in the confined space or any excavation trenches • Construction equipment shall be equipped with a vertical exhaust at least 0.6 m above ground level and /or with a park arrestors • Electrical motors and electrical extension cords shall be explosive-proof or intrinsically safe • Permit to Work procedures to be adopted for welding, flame cutting or other hot works in trenches or confined spaces • Forced ventilation if working in a trench deeper than 1 m • Close all valves immediately after piping assembly or conduiting construction. For the large diameter pipes, pipe end shall be capped on one side. Forced ventilation shall also be provided before commissioning of the pipeline and staff entering and working in it • Routine monitoring shall be conducted in all excavations to ensure the works area to be free of landfill gas before any man enters the area. • Landfill gas precautionary measures involved with excavation and piping works shall be included in the Safety Plan • Monitoring shall be conducted at the cracks on the ground floor during ground-works construction	√
	Where there are any temporary site offices, or any other buildings which have enclosed spaces with the capacity to accumulate landfill gas, then they should either: • be located on an area which has been proven to be free of landfill gas (by survey with portable gas detectors) and monitored manually by the Safety Officer or an approved wand appropriately qualified person to ensure that hazardous concentration of landfill gas does not occur; or • be raised clear of the ground. If buildings are raised clear of the ground, a minimum, clear separation (as measured from the highest point on the ground surface to the underside of lowest floor joist) should be 500mm	√

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

APPENDIX I
SUMMARY OF ENVIRONMENTAL LICENSING AND PERMIT STATUS

APPENDIX I – 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	Expansion and upgrading of existing Tai Po Sewage Treatment Works from 100,000 m^3/day to 130,000 m^3/day: (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
Consruction Noise Permit (CNP)				
GW-RN0200-11	01/07/11	30/12/11	Use of powered mechanical equipment for carrying out construction work at 7 Dai Kwai Street, Tai Po Industrial Estate, Tai Po, N.T. during 0000 – 2400 hours on general holidays (including Sundays), 0000 – 0700 hours and 1900 – 2400 hours on any day not being a general holiday.	Expired
GW-RN0512-11	01/01/12	30/06/12	Use of powered mechanical equipment for carrying out construction work at 7 Dai Kwai Street, Tai Po Industrial Estate, Tai Po, N.T. during 0000 – 2400 hours on general holidays (including Sundays), 0000 – 0700 hours and 1900 – 2400 hours on any day not being a general holiday.	Expired
GW-RN0299-12	01/07/12	30/12/12	Use of powered mechanical equipment for carrying out construction work at 7 Dai Kwai Street, Tai Po Industrial Estate, Tai Po, N.T. during 0000 – 2400 hours on general holidays (including Sundays), 0000 – 0700 hours and 1900 – 2400 hours on any day not being a general holiday.	Valid
Discharge Licence				
WT00007782-2010	25/10/10	31/10/15	Discharge of industrial trade effluent: Water Control Zone: Tolo Harbour and Channel Discharge Points: Communal drain for the carriage of surface drainage water	Valid

Permit / License No.	Valid Period		Details	Status
	From	To		
Waste Disposal (Chemical Waste)				
WPN : 5213-727-C2397-16	09/7/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid

APPENDIX J
WASTE GENERATION IN THE REPORTING QUARTER

Name of Department: DSD . Contract No.: DC/2009/09 .

(Notes: The following Waste Flow Table should be used for contracts either not included under the Pay for Safety and Environment Scheme or exempted from the full requirement for environmental management)

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	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastic (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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	3.18	0	0	3.17	0.01	0	1.2	0	0	0	0.01
Feb	1.26	0	0	1.26	0	0	0.8	0	0	0	0.005
Mar	0.002	0	0	0	0.002	0.023	0.6	0	0	0	0.002
Apr	0	0	0	0	0	0	0	0	0	0	0.003
May	1.212	0	1.2	0	0.012	0	0	0	0	0	0.011
June	1.304	0	1.3	0	0.004	0	0	0	0	0	0.012
July	0.004	0	0	0	0.004	0	0	0	0	0	0.007
Aug	2.816	0	0	0	2.816	0	0	0	0	0	0.011
Sept	0.876	0	0	0	0.876	0.015	0	0	0	0	0.003
Oct											
Nov											
Dec											
Total	10.654	0	2.5	4.43	3.724	0.038	2.6	0	0	0	0.064

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 material.
(3) Broken concrete for recycling into aggregates.

APPENDIX K
SUMMARY OF EXCEEDANCE

APPENIDX K – SUMMARY OF EXCEEDANCE

Reporting Period: July to September 2012

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

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

c) Exceedance Report for Construction Noise (NIL)

d) Exceedance Report for Landfill Gas (NIL)

APPENDIX L
COMPLAINT LOG

APPENDIX L – COMPLAINT LOG

Reporting Period: July to September 2012

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 period.