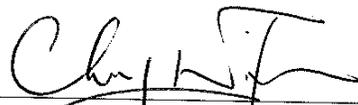


China Harbour Engineering Company Limited

Contract No. DC/2007/20

**Harbour Area Treatment Scheme Stage 2A –
Construction of Advance Disinfection Facilities at
Stonecutters Island Sewage Treatment Works
Final Environmental Monitoring and Audit Report
(Version 2.0)**

Certified By 
Dr. Priscilla Choy
(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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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
CEDD	Civil Engineering & Development Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
TSP	Total Suspended Particulates
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

EXECUTIVE SUMMARY

Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for Contract No. DC/2007/20 “Harbour Area Treatment Scheme Stage 2A – Construction of Advance Disinfection Facilities at Stonecutters Island Sewage Treatment Works” (the Project). This report documents the findings of Construction Phase EM&A Works conducted between July 2008 and December 2009.
2. The construction works for Portions 1 & 2 and Portions 3 & 4 of the Project were commenced on 18th July 2008 and 18th September 2008 respectively. The construction works have been substantially completed in early November 2009. The Construction Programme of the Project is shown in **Appendix I**. The weekly environmental site audit was ceased after the completion of testing and commissioning of E&M system and verification of outstanding items during site audit. The last site audit was conducted on 23rd December 2009. As there were no critical environmental deficiency observed, no monitoring exceedance, no complaint and prosecutions received and there would be another HATS Stage 2A Contract – DC/2007/20 which would take over the same monitoring station, the completion of the EM&A programme was proposed by ET on 24th November 2009 (Ref.: MA8009/Corres/cm91124) and verified by IEC on 25th November 2009 (Ref.: EB000403-A/E09-32956). EPD had no objection to complete construction EM&A programme (ref.: (9) in EP2/G/F/134Ax (1) Pt. 3) dated on 4 December 2009.
3. The construction activities undertaken in the construction period included:
 - Erection of temporary office for the Engineer;
 - Mobilization of piling Rig for mini-piling works at Day Tank Storage Area;
 - Re-driving existing Polypropylene carbonate (PPC) piles for chlorination compound and Switch Room No.1;
 - Pre-drilling works for Day Tank Storage Area and Switch Room No. 2;
 - Mini-piling works for Day Tank Storage Area & Switch Room No. 2;
 - Proof drilling works for mini-piles at Day Tank Area;
 - Construction of sodium hypochlorite (NaOCl) Barge Unloading Area;
 - Construction of Switch Room No. 1;
 - Installation & Excavation of Shoring System for Wash-out Chamber No. 1.
 - Diversion of DN250 Watermain at Day Tank Storage Area;
 - Excavation for Day Tank Storage Area and Switch Room No. 2;
 - Driving H-piles for Chlorination Compound;
 - Erection of Project signboard;
 - Excavation & Extension of existing PPC piles for Chlorination Compound;
 - Excavation for Dechlorination Plant in Portion 4.
 - Construction of Dechlorination Plant.
 - Construction of Washout Chamber No. 1, Wash-out Chamber No .2 & sample store room;
 - Construction of Sodium Hypochlorite Storage Compound;

- Construction of pipe trench; and
- Construction of drainage works.
- Construction of Cable Pit and Ducts.
- Installation of dosing pipe on top of Sedimentation Tanks
- Construction of Switch Room no. 3 & Uninterruptible Power Supply Battery (UPS) room.
- Installation works for Dosing pumps at Dechlorination Plant;
- Installation works for Chemical pipes at Day Tank Storage Area and Dechlorination Plant;
- Sand blasting inside steel tanks for internal lining.
- Installation works for Switch Room no.1, 2 and 3;
- Fiber Reinforced Plastic (FRP) works of open mesh flooring, handrail, toe-board and cat-ladder at Day Tank Storage Area and Dechlorination Plant;
- Fire Service (FS) and Electrical and Mechanical (E&M) works at Switch Room no.3, Uninterruptible Power Supply (UPS) Battery Room;
- Installation works for dosing pumps at Dechlorination Plant;
- Installation works for chemical pipes at Day tank Storage Area and Dechlorination Plant;
- Installation of Internal lining for steeling tanks;
- Diversion of existing DN250 watermain near Washout Chamber no.2;
- Pumps and pipework of E&M works at Sodium Hypochlorite Storage Compound will be continued to install;
- Installation of canopy over unloading bay at Sodium Hypochlorite Storage Compound;
- Installation of routers for signal cable between Switch Room No. 2 and Switch Room No. 3;
- Fiber Reinforced Plastic (FRP) working platform at Flow Distribution Chamber was erected;
- Completion of drainage system. Total 21 numbers of manhole / catch-pit were completed;
- Installation of chemical pipes, pumps and cable tray at Sodium Hypochlorite Storage Compound;
- Erection of Spiral Staircases around steel tanks at Sodium Hypochlorite Storage Compound;
- Installation of double containment dosing pipes;
- Drain pipes from manholes MH2.1 & MH2.21 to existing manholes were being laid after water main diverted;
- Installation of walkway on roofing system of Sodium Hypochlorite Storage Compound;
- Completion of Building Service (BS) works at Switch Room No. 2 & 3, Uninterrupted Power Supply (UPS) Battery Room and Portion 3;
- Walkway covering dosing pipes on top of Sedimentation Tank was being installed;
- Walkway on roofing system of Sodium Hypochlorite Storage Compound was installed;
- Canopy shelter at unloading bay of Sodium Hypochlorite Storage Compound was erected;

Environmental Monitoring Works

4. Environmental monitoring for the Project was performed regularly as stipulated in the Final EM&A Manual (the Manual) and the results were checked and reviewed. Site audits were conducted once a week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
5. Summary of the non-compliance of the project is tabulated Table I.

Table I Summary Table for Non-compliance Record of the Project

Parameters		No of Exceedances		Action Taken	Results of Action Taken	Remarks
		Action Level	Limit Level			
Air Quality	1-hr TSP	0	0	---	---	---
	24-hr TSP	0	0		---	---
Noise		0	0		---	---

Air Quality

6. Baseline and impact air quality monitoring works were conducted in accordance with the EM&A Manual.
7. No exceedances for 1-hr TSP and 24-hr TSP were recorded during the whole project period.
8. Due to the sensitivity of the military installations within Barracks building, the People's Liberation Army (PLA) had declined ET's request for setting up the air quality monitoring station AM2 (Ngong Shuen Chau Barracks – Group 2). Considering there is no other air sensitive receiver within the EIA study area (500m from the Project site boundary of Portions 3 & 4) and no significant environmental impact from the project is anticipated, the ET Leader proposed to cancel all air quality monitoring works at the designated monitoring station AM2. The proposal has been verified by IEC on 15th August 2008 (Ref.: EB00403-A/E08-25731) and approved by EPD on 2nd September 2008 (Ref.: (34) in EP 2/G/F/134 Pt2).

Construction Noise

9. One construction noise monitoring station, NM1 - Barrack Buildings, was designated in the Final EM&A Manual.
10. Due to the sensitivity of the military installations within Barracks building, the People's Liberation Army (PLA) had declined ET's request for setting up the noise monitoring station NM1 (Barrack Buildings). Considering there is no other noise sensitive receiver within the EIA study area (300 m from the Project site boundary of Portions 3 & 4) and no significant environmental impact from the project is anticipated, the ET Leader

proposed to cancel noise monitoring works at the designated monitoring station NM1. The proposal has been verified by IEC on 15th August 2008 (Ref.: EB00403-A/E08-25731) and approved by EPD on 2nd September 2008 (Ref.: (34) in EP 2/G/F/134 Pt2).

Complaints and Prosecutions

11. No environmental complaint was received in the whole project period. Details of the complaints were shown in **Appendix G**.
12. No environmental prosecution was received throughout the whole Project.

Conclusion

13. The EM&A programme were found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. During the Project period, there was no non-compliance recorded. In conclusion the Project was environmentally acceptable in terms of air quality and noise.

1. INTRODUCTION

Background

- 1.1 “Harbour Area Treatment Scheme Stage 2A – Construction of Advance Disinfection Facilities at Stonecutters Island Sewage Treatment Works” (hereinafter called “the Project”) under Contract No. DC/2007/20 is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO). A Final Environmental Impact Assessment (EIA) Report has been submitted in July 2007 to consider the key issues of noise, air quality, water quality, ecological, construction waste and human health risk, and identify possible mitigation measures. The Final EIA Report was approved by Environmental Protection Department (EPD) on 8th November 2007 and was included in the EIA register under the EIAO as report no. AEIAR-113/2007. Environmental Monitoring and Audit (EM&A) Manual for the Final EIA Report was also included as part of the Final EIA report in the register. An Environmental Permit (EP) No. EP-295/2007 was issued on 3rd December 2007 for the Project “Harbour Area Treatment Scheme – Provision of Disinfection Facilities at Stonecutters Island Sewage Treatment Works” to the Drainage Services Department (DSD) as Permit Holder. A Variation Environmental Permit (VEP) No. EP-295/2007/A was issued on 20th May 2009 for the variation of condition 1.7 and 3.6 of Part C. A further Variation Environmental Permit (VEP) No. EP-295/2007/B was issued on 25th November 2009 for the variation of condition 1.7 of Part A and 3.2 of Part C; deletion of condition 3.3 of Part C and variation of Figures 1, 3, 4 & 6 in the EP. This Project comprises the Construction Phase of the Project “Harbour Area Treatment Scheme – Provision of Disinfection Facilities at Stonecutters Island Sewage Treatment Works”.
- 1.2 The construction works of the advance disinfection facilities (ADF) include:
- (a) Chlorination system - provision of a sodium hypochlorite solution storage farm and associated dosing system; and
 - (b) Dechlorination system - provision of a sodium bisulphite storage and associated dosing system.
- 1.3 The Project site layout plan is shown in **Figure 1.1**.
- 1.4 The Project was constructed within the existing sewage treatment works on Stonecutters Island (SCISTW), which is providing Chemically Enhanced Primary Treatment (CEPT) for 1.4 million cubic metres of sewage collected each day through deep tunnels from the HATS Stage 1 catchments (i.e. the whole of Kowloon peninsula, Tseung Kwan O, Kwai Chung, Tsing Yi, Chai Wan and Shau Kei Wan). The design treatment capacity of the SCISTW is 1.7 million cubic metres per day.
- 1.5 The chlorination system of the disinfection facilities was located within the site boundary of the existing SCISTW (Figure 1.1 refers). The dechlorination plant was located adjacent to the existing chamber no. 15 (Figure 1.1 refers) at the western end of Container Port Road South.

-
- 1.6 China Harbour Engineering Company Limited (CHEC) was awarded as the main contractor (hereinafter called “the Contractor”) of the Project. Cinotech Consultants Limited (Cinotech) was commissioned by CHEC as the Environmental Team (ET). Dr. Priscilla CHOY of Cinotech was appointed as the ET Leader of the Project in accordance with EP Condition 2.1. Hyder Consulting Limited (Hyder) was employed by DSD to undertake Independent Environmental Checker (IEC) services of the Project and Mr. Antony Wong of Hyder was appointed as the IEC under EP Condition 2.2.
- 1.7 The construction works for Portions 1 & 2 and Portions 3 & 4 of the Project were commenced on 18th July 2008 and 18th September 2008 respectively. The construction works have been substantially completed in early November 2009. The Construction Programme of the Project is shown in Appendix I. The weekly environmental site audit was ceased after the completion of testing and commissioning of E&M system and verification of outstanding items during site audit. The last site audit was conducted on 23rd December 2009. As there were no critical environmental deficiency observed, no monitoring exceedance, no complaint and prosecutions received and there would be another HATS Stage 2A Contact – DC/2007/20 which would take over the same monitoring station, the completion of the EM&A programme was proposed by ET on 24th November 2009 (Ref.: MA8009/Corres/cm91124) and verified by IEC on 25th November 2009 (Ref.: EB000403-A/E09-32956). EPD had no objection to complete construction EM&A programme (ref.: (9) in EP2/G/F/134Ax (1) Pt. 3) dated on 4 December 2009.
- 1.8 This Final EM&A report was prepared by Cinotech for the Project to summarize the finding of all EM&A Works associated with baseline monitoring and construction activities conducted between June 2008 and December 2009.

Project Organizations

1.9 Different parties with different levels of involvement in the project organization include:

- Project Proponent/ Permit Holder – Drainage Services Department (DSD)
- Engineer’s Representative (ER) – Ove Arup & Partners Hong Kong Ltd. (ARUP)
- Contractor – China Harbour Engineering Company Limited (CHEC)
- Environmental Team (ET) – Cinotech Consultants Ltd. (Cinotech)
- Independent Environmental Checker (IEC) – Hyder Consulting Limited (Hyder)

1.10 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	Project Proponent/ Permit Holder	Ms. Ada LAI	Engineer	2159 3411	2833 9162
ARUP	Engineer’s Representative	Mr. Gary CHEUNG	Resident Engineer	6201 3158	2407 8772
		Mr. Sunny LO	Inspector of Works	6345 0548	
CHEC	Contractor	Mr. T. K. CHEUNG	Project Manager	2741 0191	2741 2772
		Mr. Aaron AU	Site Agent	6345 0754	
		Mr. M. C. LAM	Environmental Officer	9483 0566	
Cinotech	Environmental Team	Dr. Priscilla CHOY	Environmental Team Leader	2151 2089	3107 1388
		Mr. Kin CHAN	Environmental Team Member	2151 2077	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Hyder	Independent Environmental Checker	Mr. Antony WONG	Independent Environmental Checker	2911 2744	2805 5028
		Mr. Terence KONG	Project Manager	2911 2730	
		Ms. Selina LEUNG	Independent Environmental Checker Representative	2911 2745	

Construction Programme

1.11 The construction activities undertaken in the construction period included:

- Erection of temporary office for the Engineer;
- Mobilization of piling Rig for mini-piling works at Day Tank Storage Area;
- Re-driving existing Polypropylene carbonate (PPC) piles for chlorination compound and Switch Room No.1;
- Pre-drilling works for Day Tank Storage Area and Switch Room No. 2;
- Mini-piling works for Day Tank Storage Area & Switch Room No. 2;
- Proof drilling works for mini-piles at Day Tank Area;
- Construction of sodium hypochlorite (NaOCl) Barge Unloading Area;

- Construction of Switch Room No. 1;
- Installation & Excavation of Shoring System for Wash-out Chamber No. 1.
- Diversion of DN250 Watermain at Day Tank Storage Area;
- Excavation for Day Tank Storage Area and Switch Room No. 2;
- Driving H-piles for Chlorination Compound;
- Erection of Project signboard;
- Excavation & Extension of existing PPC piles for Chlorination Compound;
- Excavation for Dechlorination Plant in Portion 4.
- Construction of Dechlorination Plant.
- Construction of Washout Chamber No. 1, Wash-out Chamber No .2 & sample store room;
- Construction of Sodium Hypochlorite Storage Compound;
- Construction of pipe trench; and
- Construction of drainage works.
- Construction of Cable Pit and Ducts.
- Installation of dosing pipe on top of Sedimentation Tanks
- Construction of Switch Room no. 3 & Uninterruptible Power Supply Battery (UPS) room.
- Installation works for Dosing pumps at Dechlorination Plant;
- Installation works for Chemical pipes at Day Tank Storage Area and Dechlorination Plant;
- Sand blasting inside steel tanks for internal lining.
- Installation works for Switch Room no.1, 2 and 3;
- Fiber Reinforced Plastic (FRP) works of open mesh flooring, handrail, toe-board and cat-ladder at Day Tank Storage Area and Dechlorination Plant;
- Fire Service (FS) and Electrical and Mechanical (E&M) works at Switch Room no.3, Uninterruptible Power Supply (UPS) Battery Room;
- Installation works for dosing pumps at Dechlorination Plant;
- Installation works for chemical pipes at Day tank Storage Area and Dechlorination Plant;
- Installation of Internal lining for steeling tanks;
- Diversion of existing DN250 watermain near Washout Chamber no.2;
- Pumps and pipework of E&M works at Sodium Hypochlorite Storage Compound will be continued to install;
- Installation of canopy over unloading bay at Sodium Hypochlorite Storage Compound;
- Installation of routers for signal cable between Switch Room No. 2 and Switch Room No. 3;
- Fiber Reinforced Plastic (FRP) working platform at Flow Distribution Chamber was erected;
- Completion of drainage system. Total 21 numbers of manhole / catch-pit were completed;
- Installation of chemical pipes, pumps and cable tray at Sodium Hypochlorite Storage Compound;
- Erection of Spiral Staircases around steel tanks at Sodium Hypochlorite Storage Compound;
- Installation of double containment dosing pipes;
- Drain pipes from manholes MH2.1 & MH2.21 to existing manholes were being laid after water main diverted;

- Installation of walkway on roofing system of Sodium Hypochlorite Storage Compound;
- Completion of Building Service (BS) works at Switch Room No. 2 & 3, Uninterrupted Power Supply (UPS) Battery Room and Portion 3;
- Walkway covering dosing pipes on top of Sedimentation Tank was being installed;
- Walkway on roofing system of Sodium Hypochlorite Storage Compound was installed;
- Canopy shelter at unloading bay of Sodium Hypochlorite Storage Compound was erected;

Summary of EM&A Requirements

- 1.12 The EM&A programme requires construction phase air quality and noise 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 Final EIA report; and
 - Environmental requirements in contract documents.
- 1.13 The advice on the implementation status of environmental protection and pollution control/mitigation measures is presented in **Appendix F**.
- 1.14 The monitoring parameters, Action and Limit Levels and the Event Action Plans are described in details in coming section.
- 1.15 This Final EM&A Summary Report summarizes the baseline and impact EM&A works conducted for the Project between June 2008 and December 2009.

2. AIR QUALITY MONITORING

Monitoring Requirements

- 2.1 Baseline and impact air quality monitoring was conducted in accordance with the EM&A Manual. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

- 2.2 Baseline and impact air quality monitoring was conducted at Stations AM 1 and AM 2. Table 2.1 describes the air quality monitoring locations. **Figure 1.2** shows the locations of these stations. **Figure 1.3** shows the locations of representative air sensitive receivers (ASRs).

Table 2.1 Locations for Air Quality Monitoring Station

Monitoring Stations	Location	Status
AM 1	Rooftop, Block A of Government Dockyard	Impact Monitoring
AM 2	Barracks building, the People's Liberation Army	Cancelled

- 2.3 Due to the sensitivity of the military installations within Barracks building, the People's Liberation Army (PLA) had declined ET' s request for setting up the air quality monitoring station AM2 (Ngong Shuen Chau Barracks – Group 2). Considering there is no other air sensitive receiver within the EIA study area (500m from the Project site boundary of Portions 3 & 4) and no significant environmental impact form the project is anticipated, the ET Leader proposed to cancel all air quality monitoring works at the designated monitoring station AM2. The proposal has been verified by IEC on 15th August 2008 (Ref.: EB00403-A/E08-25731) and approved by EPD on 2nd September 2008 (Ref.: (34) in EP 2/G/F/134 Pt2)
- 2.4 No air quality monitoring was conducted at AM 2 for the Project.

Monitoring Equipment

- 2.5 Table 2.2 summarizes the equipment used in the baseline and impact air monitoring programme. Calibrations of equipments are conducted once per two months. Copies of calibration certificates are attached in the Baseline and Monthly EM&A Reports.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Qty.
HVS Samplers	Graseby GMW 2310 HVS, Model GS-2310105-1	1 (for 24-hr TSP)
	Tisch Environmental, Inc.; Model no. TE-5170	1 (for 1-hr TSP)
Calibrator	Tisch Environmental, Inc.; Model no. TE-5025A	1
Wind Anemometer	Davis Weather Monitor II, Model no. 7440	1

Monitoring Parameters, Frequency and Duration

- 2.6 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period.

Table 2.3 Air Monitoring Parameters, Frequencies and Durations

	Parameters	Frequency
Baseline Monitoring	1-hour TSP	3 times / day
	24-hour TSP	Once / day
Impact Monitoring	1-hour TSP	Three times / 6 days
	24-hour TSP	Once / 6 days

Results and Observations*Baseline Monitoring*

- 2.7 Baseline air quality monitoring was conducted at monitoring station AM 1 during 8th June 2008 and 21st June 2008. The statistical analyses of the monitoring results are summarized in Table 2.4. The graphical presentations for baseline air quality monitoring are shown in Appendix B.

Table 2.4 Summary of Baseline Air Quality Monitoring Results

Station	1-Hour TSP ($\mu\text{g}/\text{m}^3$)			24-Hour TSP ($\mu\text{g}/\text{m}^3$)		
	Mean	Max.	Min.	Mean	Max.	Min.
AM 1	88	344	12	43	63	29

- 2.8 The weather was generally rainy, cloudy and sometimes sunny during the baseline monitoring period at Station AM 1 during the baseline monitoring periods. No observable dust sources were identified for Station AM1. However, white fume was observed emitted from the vessel maintenance activities inside Government Dockyard on 16th June 2008 morning.

Impact Monitoring

- 2.9 Impact air quality monitoring was conducted at all designated locations and the monitoring locations agreed by the Engineer during the construction period between July 2008 and November 2009. The statistical analyses of the monitoring results are summarized in Table 2.5. The graphical presentations for impact air quality monitoring are shown in Appendix C.

Table 2.5 Summary of Impact Air Quality Monitoring Results

Station	1-Hour TSP ($\mu\text{g}/\text{m}^3$)			24-Hour TSP ($\mu\text{g}/\text{m}^3$)		
	Mean	Max.	Min.	Mean	Max.	Min.
AM 1	111	295	11	63	145	20

- 2.10 A wind data monitoring equipment was installed at monitoring station AM 1 for logging wind speeds and wind directions. The wind data during the impact monitoring were reported in the Monthly EM&A Reports. Weather condition during the monitoring period is shown in Appendix D.
- 2.11 No Action Level and Limit Level exceedances for 1-hr TSP and 24-hr TSP were recorded during the whole project period. Event Action Plans was attached as Appendix E.

3. NOISE

- 3.1 One construction noise monitoring station, NM1 - Barrack Buildings, was designated in the Final EM&A Manual. **Figure 1.4** shows the location of representative noise sensitive receiver (NSR).
- 3.2 According to the EM&A manual, the Action and Limit Levels for Construction Noise of the project is shown in Table 3.1

Table 3.1 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700 -1900 hours on normal weekdays	When one documented complaint is received	75 dB(A)

- 3.3 Due to the sensitivity of the military installations within Barracks building, the People's Liberation Army (PLA) had declined ET' s request for setting up the noise monitoring station NM1 (Barrack Buildings). Considering there is no other noise sensitive receiver within the EIA study area (300m from the Project site boundary of Portions 3 & 4) and no significant environmental impact form the project is anticipated, the ET Leader proposed to cancel noise monitoring works at the designated monitoring station NM1. The proposal has been verified by IEC on 15th August 2008 (Ref.: EB00403-A/E08-25731) and approved by EPD on 2nd September 2008 (Ref.: (34) in EP 2/G/F/134 Pt2).
- 3.4 No construction noise monitoring was conducted for the Project.
- 3.5 No exceedance of action and limit level was recorded as there was no complaint received during the project period.

4. ENVIRONMENTAL REVIEW

Site Audits

- 4.1 Site audit provided a direct means to trigger and enforce the specified environmental protection and pollution control measures. The ET undertook site audits routinely to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Additionally, the ET was responsible for defining the scope of the inspections, detailing any deficiencies that are identified, and reporting any necessary action or mitigation measures that were implemented as a result of the audit.
- 4.2 Site audits were carried out once per week. The areas of inspection included the general environmental conditions in the vicinity of the site, pollution control and mitigation measure within the site, and also review the environmental conditions outside the site area which are likely to be affected, directly or indirectly, by the site activities.

Comparison between the EM&A data with the EIA data

Air Quality Monitoring

- 4.3 The EPD air quality monitoring station at Sham Shui Po is the nearest monitoring station to the Site Area. In the EIA report, the monitoring data of the station in year 2005 was used to reflect the condition of the site area. The annual average concentration of total suspended particulates (TSP) at the station was $83\mu\text{g}/\text{m}^3$. The mean 24-hour TSP during the air quality monitoring of this EM&A programme is $63\mu\text{g}/\text{m}^3$. No increase of the TSP was observed during the construction works of the Project.

Effectiveness of the solid and liquid waste management

Waste Management Audit

- 4.4 Waste management audit was conducted by the ET on a weekly basis at the same time with weekly site audit. During the monitoring period, the Contractor followed the recommended procedure stipulated in the EM&A Manual. Summary of the waste generated by the Project is shown in **Appendix H and Table 4.1**.
- 4.5 In accordance with the information provided by Contractor, the expected disposal of Public Fill should be 4331m^3 . However, the actual quantity was more than expected because the thickness of pile cap of NaOCl Storage Compound was changed from 1.0m to 1.2m and there was an inverted beam with 500mm deep around the pile.
- 4.6 The inert C&D waste was disposed at Tuen Mun Area 38 while the non-inert waste was disposed at SENT landfill in Tseung Kwan O (TKO).
- 4.7 No chemical waste was generated because all the plants including generators used for the Project were hired and no lubricating oil were replaced on-site (i.e., no waste lubricating oil was generated) during the construction period.

Table 4.1 Summary of the Waste Generated by the Project

Year	Actual Quantities of Inert C&D Material Generated		Actual Quantities of C&D Waste Generated	
	Total Quantities generated (in '000m ³)	Disposed as Public Fill (in '000m ³)	Total Quantities generated (in '000m ³)	Others, e.g. general refuse (in '000m ³)
2008	4.624	4.624	0.100	0.100
2009	1.225	1.225	0.085	0.085
Total	5.849	5.849	0.185	0.185

Review of Environmental Monitoring Procedures

- 4.8 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- The monitoring team recorded the temperature and weather conditions on the monitoring day.

Implementation Status of Environmental Mitigation Measures

- 4.9 The mitigation measures detailed in the Environmental Permit and the Manual were implemented throughout the whole project period.
- 4.10 No non-compliance was recorded throughout the construction period. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.

Summary of Record of All Complaints Received

- 4.11 No environmental complaints have been received since the commencement of the Project. A complaint log is given in **Appendix G**.

Summary of Record of Notifications of Summons and Successful Prosecutions

- 4.12 No environmental summon and prosecution has been received since the commencement of the Project.

5. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

Comments on Overall EM&A Programme

- 5.1 The EM&A works were conducted in accordance with the Manual. The EM&A programme included air quality monitoring and site audits. No noise monitoring was conducted as the sensitivity of the military installations within Barracks building, the People's Liberation Army (PLA) had declined ET' s request for setting up the construction noise monitoring station.
- 5.2 The EM&A methodology was effective in monitoring the environmental impacts of the Project. The data collected were useful in determining whether the Project has caused unacceptable impacts on the sensitive receivers. During the construction phase the impact data indicated where exceedances occurred and helped determine whether the exceedances were due to the works. Analysis of all EM&A data collected throughout the construction periods demonstrated the environmental acceptability of the Project.
- 5.3 The weekly site inspections were effective to ensure the implementation and efficiency of the mitigation measures. In addition, the recommendations made by the auditors of the ET could continuously improve the house keeping of the Contractor and maintain good site cleaning and tidiness. As a result, environmental nuisance to the public could be reduced to a minimal.
- 5.4 Therefore, the overall performance of the environmental management system in this Project was sound and effective.

Comparison between EM&A data and EIA findings

Air Quality

- 5.5 According to the EIA report, dust levels at all ASRs would comply with the dust criteria with the implementation of mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation.
- 5.6 No Action Level and Limit Level exceedances for 1-hr TSP and 24-hr TSP were recorded during the project period. The mitigation measures were effective to control the dust level.

Noise

- 5.7 According to the EIA report, proper designs of chlorination plant, day tank and dechlorination plant would control the potential noise impact at noise sensitive receivers within acceptable levels. As no complaint was received for the noise issue during the Project period, the noise generated during the construction period caused no significant impact to the noise sensitive receivers.

Water Quality

- 5.8 Construction of the Project did not involve marine works such as dredging or filling. The construction works had been land-based and designed not to affect normal operation of the SCISTW and the sewage effluent quality. Construction phase water quality issues would include the impacts from site run-off, sewage from workforce,

accidental spillage and discharges of wastewater from various construction activities. Those issues were monitored during weekly site audit to ensure the Contractor complied with the mitigation measures designed for the Project to avoid and minimize water quality impacts.

Marine Ecology

- 5.9 No marine works were included in this Project, and therefore no ecological impact was expected by the EIA report.

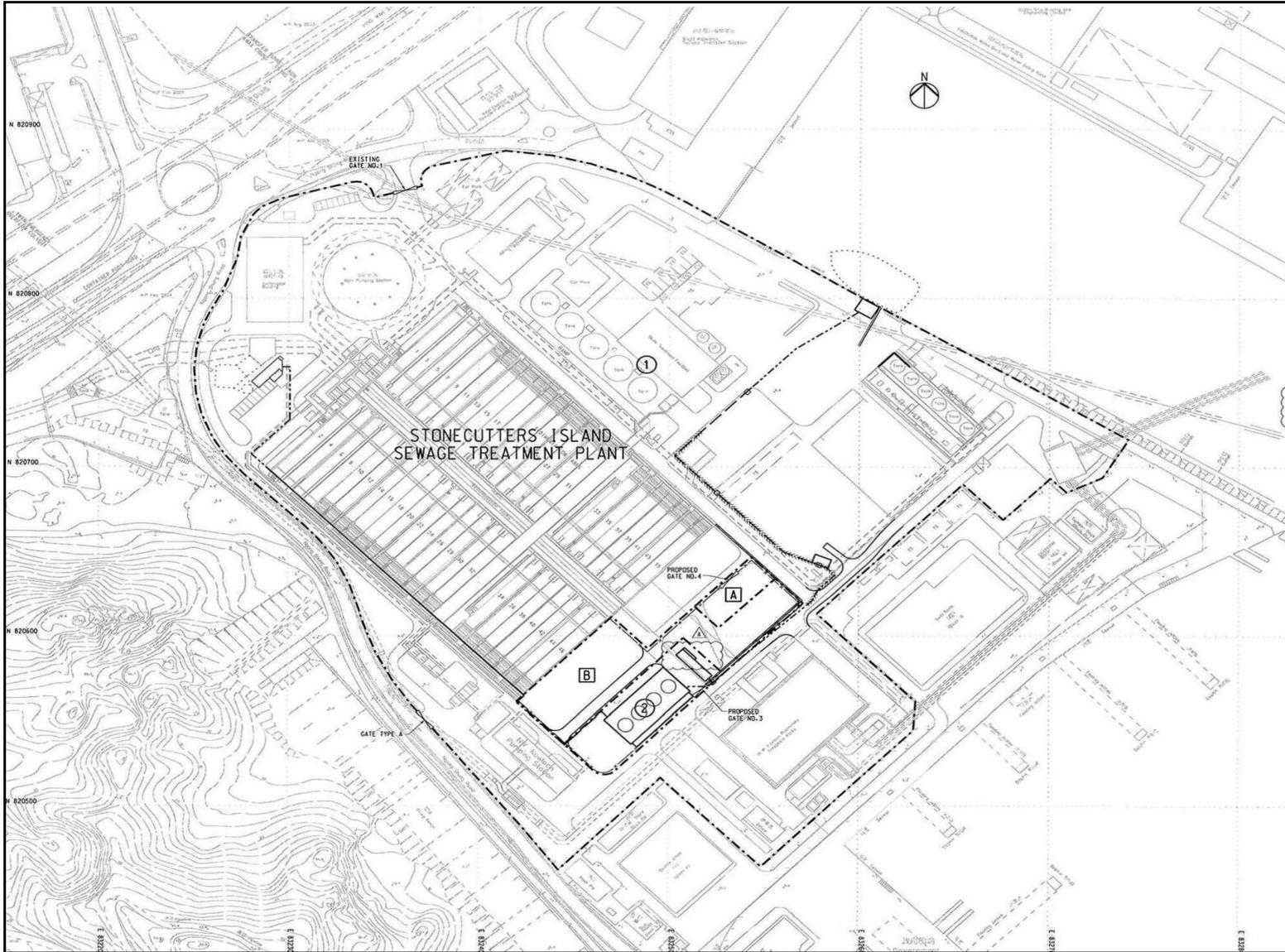
Fisheries Impact

- 5.10 No loss of habitats nor nursery and spawning grounds was anticipated from the Project. No impact on marine fisheries was observed during the construction of the Project.

Recommendations and Conclusions

- 5.11 The EM&A programme was found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. There was no non-compliance recorded. In conclusion the Project was environmentally acceptable in terms of air quality and noise levels.
- 5.12 With the success of the overall EM&A programme, the deterioration of the Project could be cost-effectively identified and necessary prompt effective mitigation measures were implemented to avoid any unacceptable the impacts.

FIGURES



- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
 2. ALL LEVELS REFER TO P.D.H.K. AND ARE IN METRES.
 3. ALL GRIDS REFER TO HONG KONG 1980 GRID.
 4. A PROJECT SIGNBOARD SHALL BE ERECTED WITHIN WORKS AREA B WITH LOCATION TO BE DETERMINED BY THE ENGINEER.
 5. THE CONTRACTOR SHALL BE PERMITTED TO RETAIN THE WORKS AREAS FOR USE UP TO THE SUBSTANTIAL COMPLETION OF THE WORKS SOLELY FOR THE PURPOSE OF COMPLETING HIS OBLIGATION WITH RESPECT TO THE WORKS OF THIS CONTRACT OR AT SUCH LATER DATE AS THE ENGINEER MAY ADVISE THE CONTRACTOR IN WRITING.
- LEGEND :**
- PORTION / WORKS AREA
 - 1 PORTION 1
 - A WORKS AREA A
 - - - CHAIN LINK FENCE TYPE 1 WITH GATE
 - - - TWIN DOUBLE-CONTAINMENT PIPES AND TRENCH WITH MULTI-LAYER COVER
 - - - TWIN DOUBLE-CONTAINMENT PIPES AND TRENCH WITH PRECAST CONCRETE COVER
 - - - TWIN DOUBLE-CONTAINMENT PIPES WITHOUT TRENCH
 - ▨ SCREENING STRUCTURE MADE OF WATER-FILLED BARRIERS
 - ⊞ TWO LAYERS GEOMEMBRANE
 - ⚓ GATE

Contract No. DC/2007/20
 HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF ADVANCE DISINFECTION FACILITIES
 AT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS

Scale
N.T.S

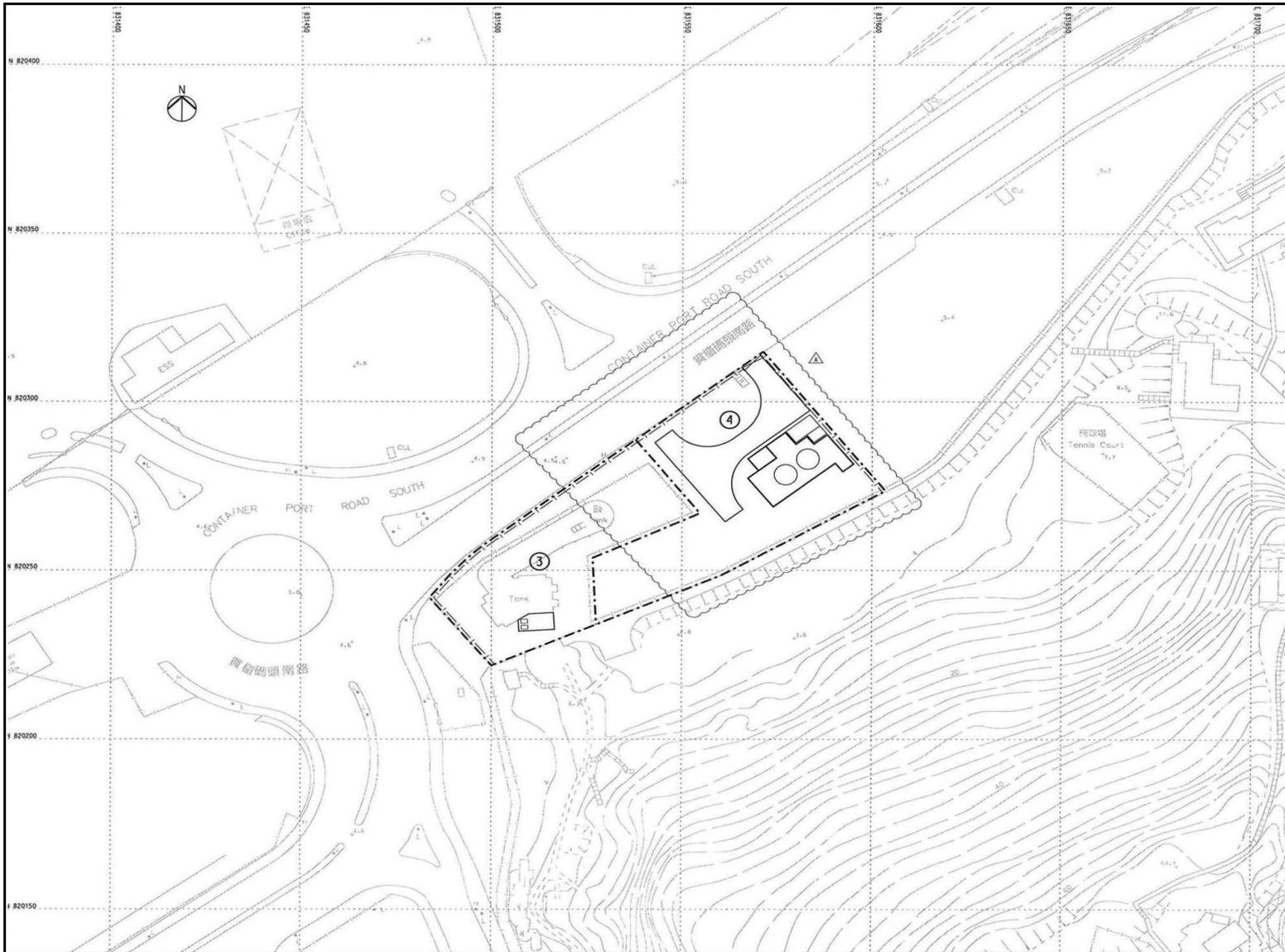
Project
No. MA8009

Project Site Layout Plan (Page 1 of 2)

Date
Jun-08

Figure
1.1





NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. GRID LINES ARE HONG KONG GRID 1980.
3. A PROJECT SIGNBOARD SHALL BE ERRECTED NEAR GATE NO. 5 IN PORTION 4 WITH LOCATION TO BE DETERMINED BY THE ENGINEER.

LEGEND :

-  PORTION/WORKS AREA
-  PORTION 3
-  HOARDING WITH GATE
-  EXISTING FENCING TO BE DEMOLISHED
-  GATE

Contract No. DC/2007/20
 HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF ADVANCE DISINFECTION FACILITIES
 AT STONECUTTERES ISLAND SEWAGE TREATMENT WORKS

Scale
 N.T.S

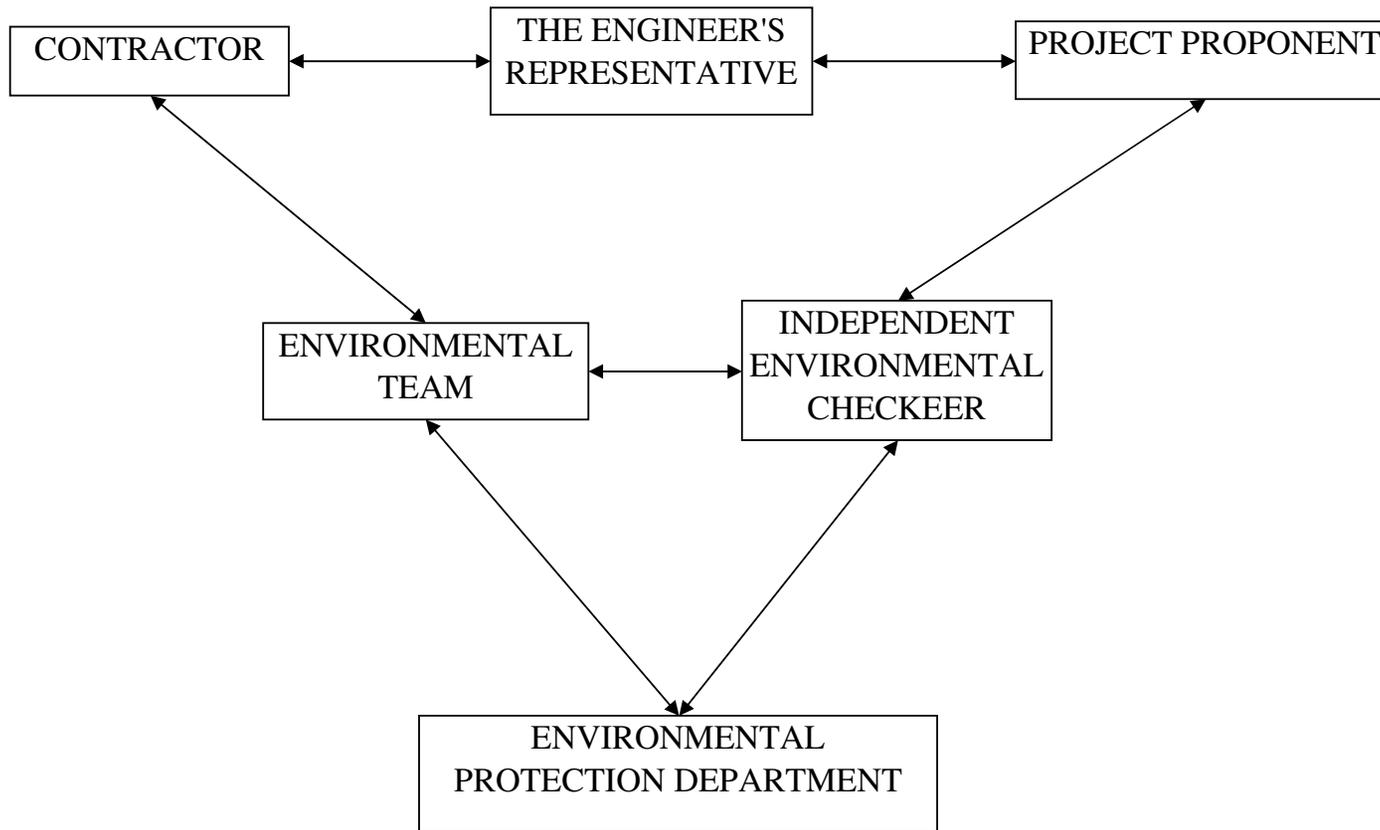
Project
 No. MA8009

Project Site Layout Plan (Page 2 of 2)

Date
 Jun-08

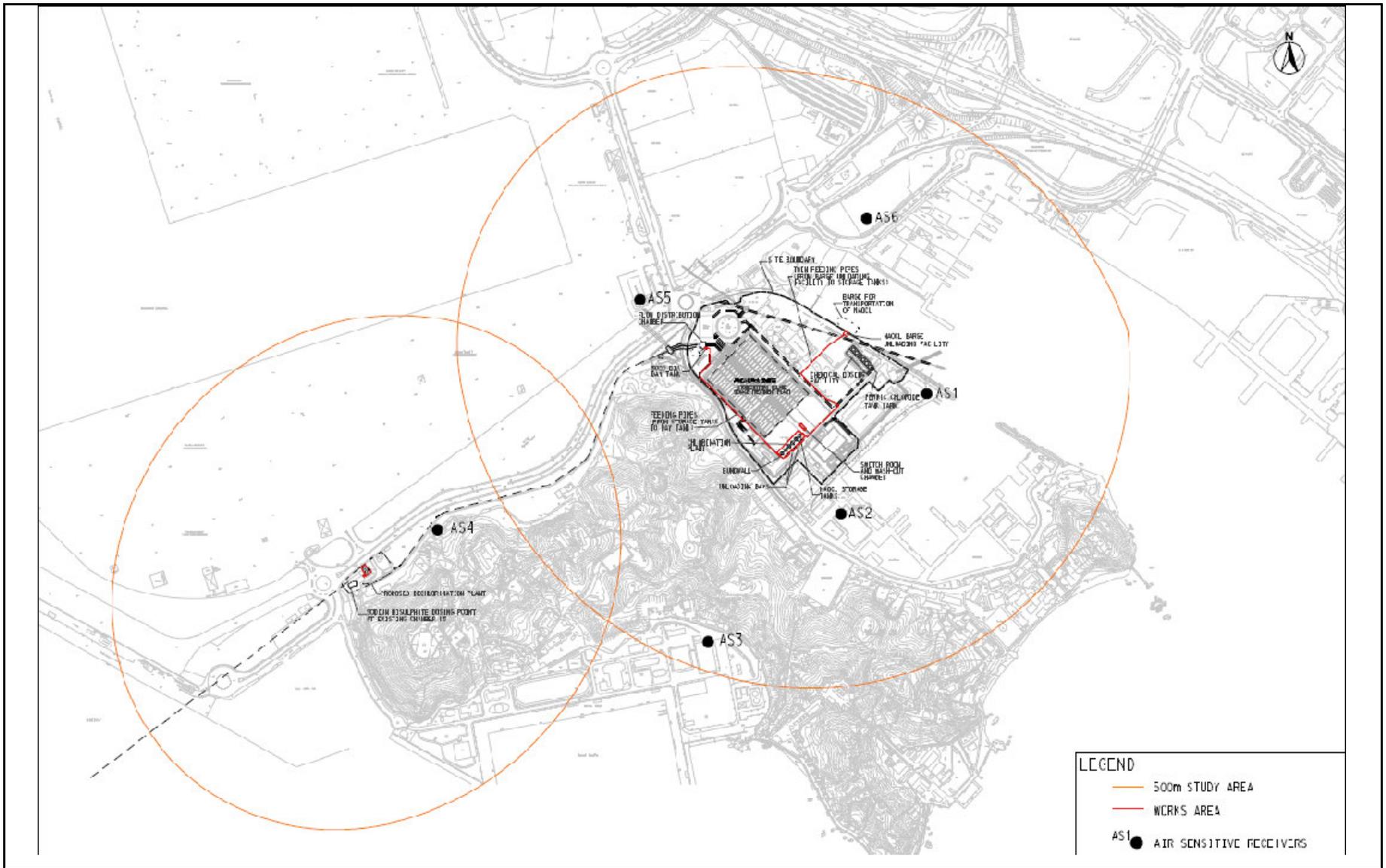
Figure
 1.1





LEGEND:
 ↔ LINE OF COMMUNICATION

Contract No. DC/2007/20 HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF ADVANCE DISINFECTION FACILITIES AT STONECUTTERES ISLAND SEWAGE TREATMENT WORKS	Scale N.T.S	Project No. MA8009	
Project Organization Chart	Date Jun-08	Figure 1.2	



<p>Contract No. DC/2007/20 HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF ADVANCE DISINFECTION FACILITIES AT STONECUTTERES ISLAND SEWAGE TREATMENT WORKS</p>	<p>Scale N.T.S</p>	<p>Project No. MA8009</p>	
<p>LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS</p>	<p>Date Feb-10</p>	<p>Figure 1.3</p>	



<p>Contract No. DC/2007/20 HARBOUR AREA TREATMENT SCHEME STAGE 2A - CONSTRUCTION OF ADVANCE DISINFECTION FACILITIES AT STONECUTTERES ISLAND SEWAGE TREATMENT WORKS</p>	<p>Scale N.T.S</p>	<p>Project No. MA8009</p>	
<p>LOCATION OF REPRESENTATIVE NOISE SENSITIVE RECEIVER</p>	<p>Date Feb-10</p>	<p>Figure 1.4</p>	

**APPENDIX A
ACTION AND LIMIT LEVELS**

APPENDIX A - Action and Limit Levels**Table A-1 Action and Limit Levels for 1-Hour TSP**

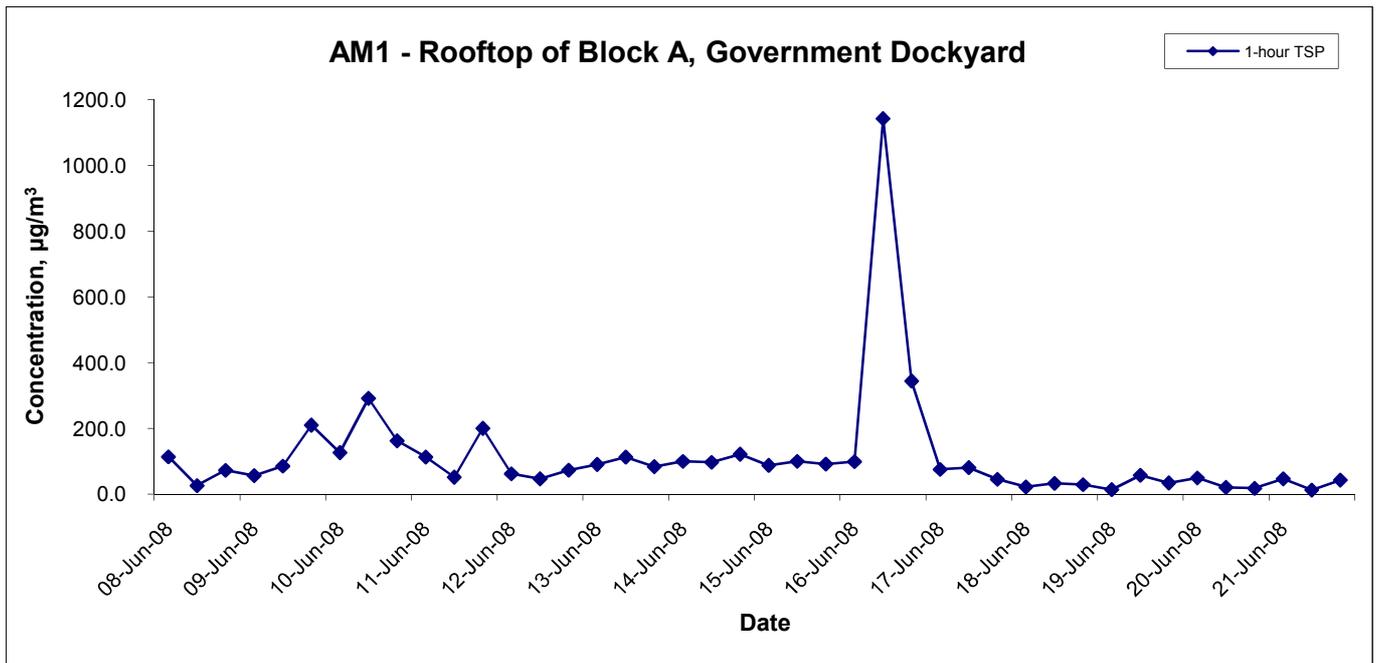
Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM1	307	500

Table A-2 Action and Limit Levels for 24-Hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM1	158	260

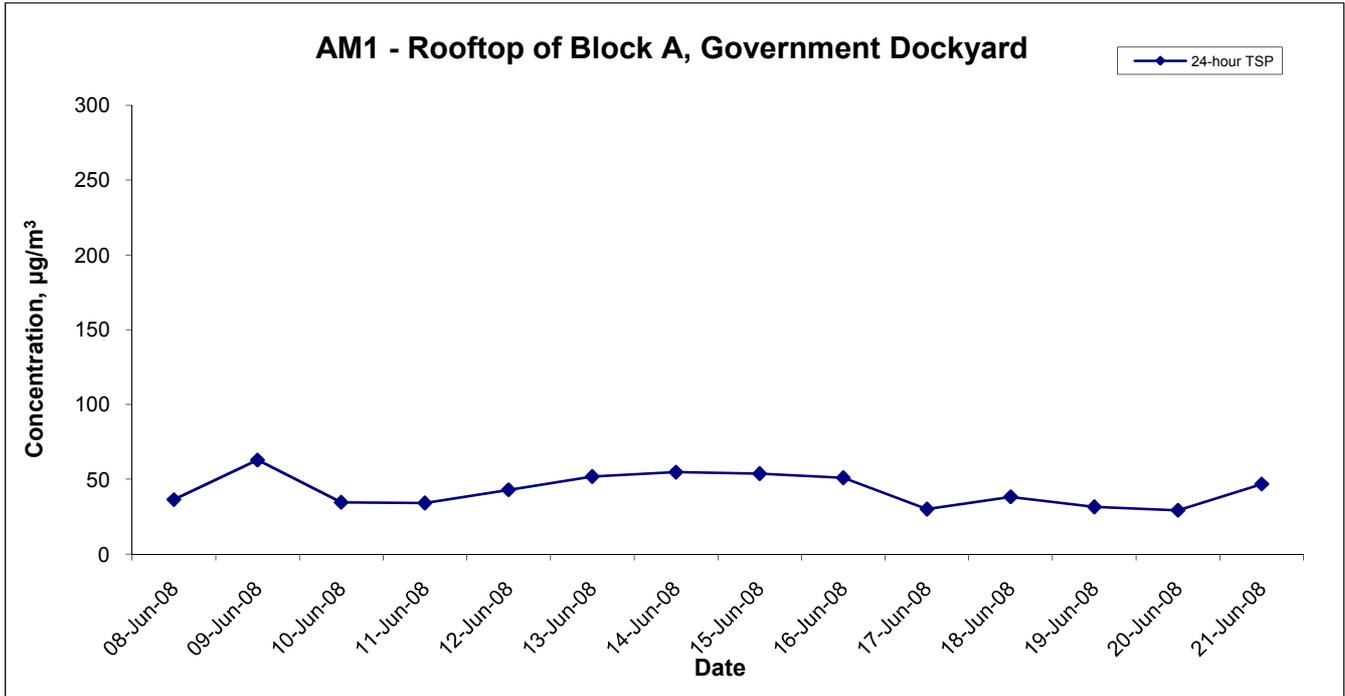
**APPENDIX B
BASELINE AIR QUALITY MONITORING
GRAPHICAL PRESENTATIONS**

1-hr TSP Concentration Levels



Title Contract No. DC/2007/20 HATS Stage 2A – Construction of Advance Disinfection Facilities at SCISTW Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA8009	CINOTECH
	Date Jun 08	Appendix B	

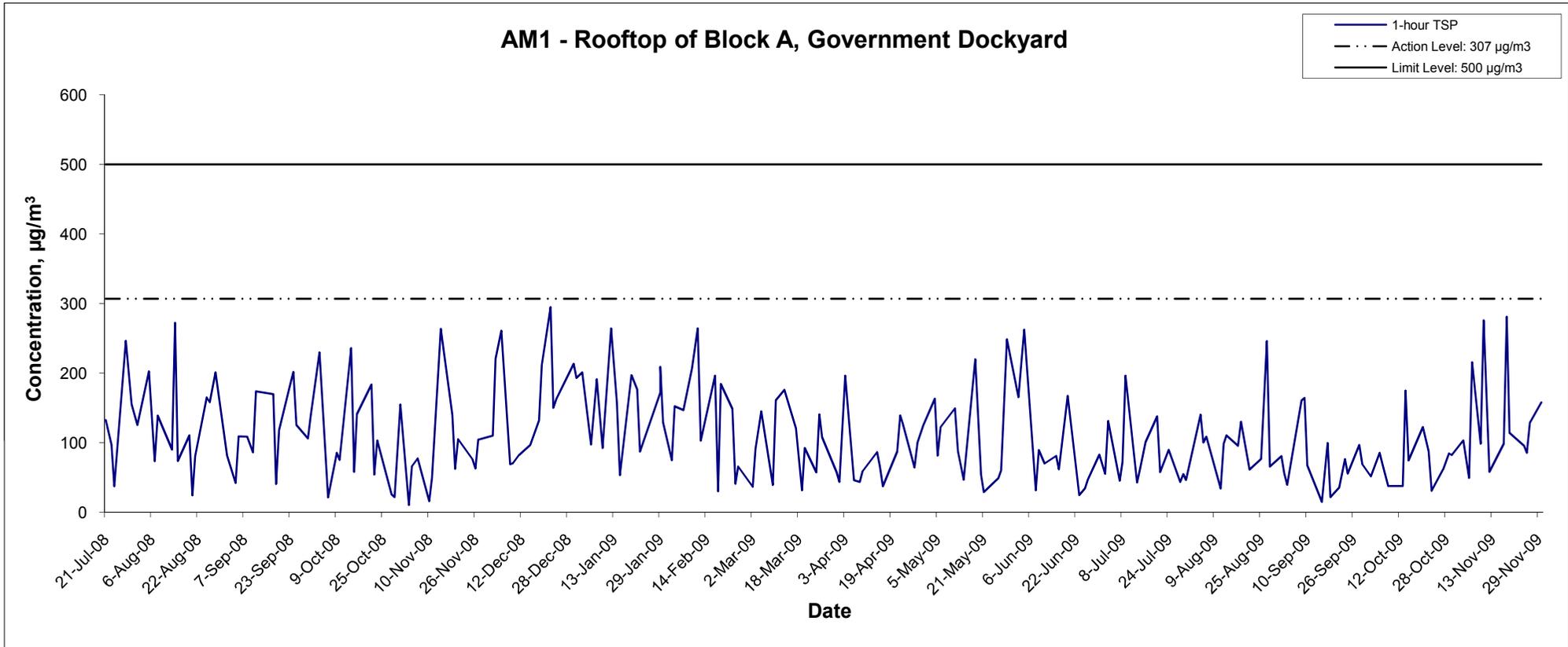
24-hr TSP Concentration Levels



Title Contract No. DC/2007/20 HATS Stage 2A – Construction of Advance Disinfection Facilities at SCISTW Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S	Project No. MA8009	CINOTECH
	Date Jun 08	Appendix B	

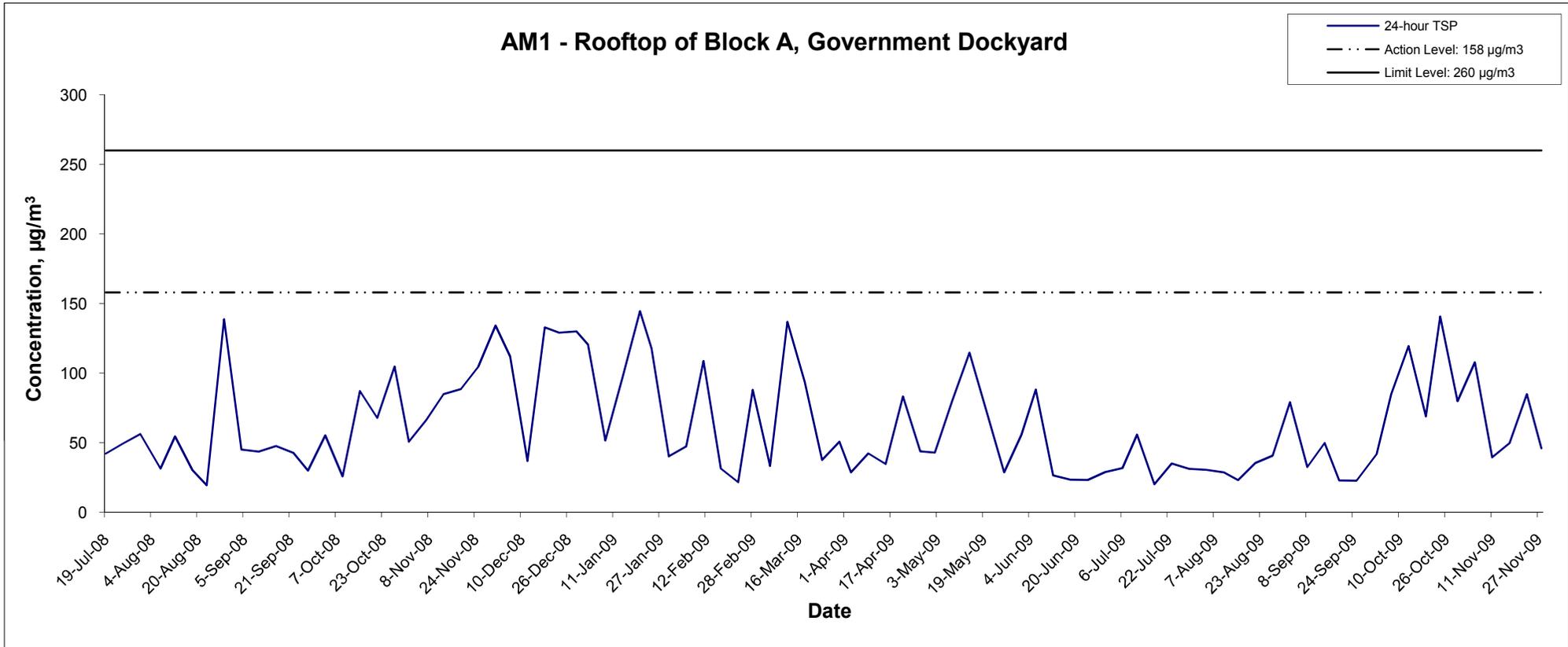
**APPENDIX C
IMPACT AIR QUALITY MONITORING
GRAPHICAL PRESENTATIONS**

1-hr TSP Levels



Title Contract No. DC/2007/20 HATS Stage 2A – Construction of Advance Disinfection Facilities at SCISTW Graphical Presentation of 1-hour TSP Impact Monitoring Results	Scale N.T.S	Project No. MA8009	
	Date Nov 09	Appendix C	

24-hr TSP Levels



Title

Contract No. DC/2007/20
HATS Stage 2A – Construction of Advance Disinfection Facilities at SCISTW
Graphical Presentation of 24-hour TSP Impact Monitoring Results

Scale

N.T.S

Date

Nov 09

Project

No.

MA8009

Appendix

C

CINOTECH

**APPENDIX D
WEATHER CONDITION DURING
IMPACT AIR QUALITY MONITORING**

Appendix D - Weather Condition during TSP Monitoring

1-hour TSP Monitoring at Station AM1 - Rooftop of Block A, Government Dockyard

Date	Sampling	Weather	Air	Atmospheric
	Time	Condition	Temp. (K)	Pressure (Pa)
21-Jul-08	11:00	Sunny	302.7	758.3
23-Jul-08	09:00	Sunny	303.6	758.0
24-Jul-08	09:00	Sunny	303.6	758.7
28-Jul-08	11:00	Sunny	304.4	752.3
30-Jul-08	09:00	Sunny	302.2	753.4
1-Aug-08	10:00	Sunny	301.1	760.1
5-Aug-08	09:00	Cloudy	302.4	753.6
7-Aug-08	10:30	Cloudy	299.1	754.3
8-Aug-08	15:05	Cloudy	298.5	755.6
13-Aug-08	11:00	Sunny	302.5	760.2
14-Aug-08	09:00	Sunny	302.4	758.4
15-Aug-08	09:00	Sunny	302.3	756.5
18-Aug-08	09:00	Sunny	302.1	759.9
20-Aug-08	09:00	Sunny	303.7	758.9
21-Aug-08	09:00	Sunny	302.3	756.6
25-Aug-08	10:00	Sunny	301.5	760.7
26-Aug-08	09:00	Sunny	301.6	760.6
28-Aug-08	09:00	Sunny	303.9	752.7
1-Sep-08	10:00	Sunny	303.1	759.9
4-Sep-08	09:00	Cloudy	300.9	760.8
5-Sep-08	10:30	Cloudy	300.7	760.6
8-Sep-08	09:00	Cloudy	301.3	762.4
10-Sep-08	09:00	Sunny	302.6	760.3
11-Sep-08	11:00	Sunny	302.7	759.0
17-Sep-08	09:00	Sunny	303.3	758.7
18-Sep-08	09:00	Cloudy	300.1	760.2
19-Sep-08	09:00	Cloudy	299.3	761.5
23-Sep-08	09:30	Cloudy	297.7	756.5
24-Sep-08	09:00	Cloudy	299.7	756.2
25-Sep-08	09:00	Cloudy	302.0	760.1
29-Sep-08	10:00	Sunny	300.0	759.4
30-Sep-08	09:00	Sunny	299.7	761.8
3-Oct-08	09:00	Sunny	299.5	761.5
6-Oct-08	10:00	Cloudy	296.8	760.1
9-Oct-08	09:00	Cloudy	300.3	765.3
10-Oct-08	14:00	Sunny	303.1	763.6
14-Oct-08	09:00	Sunny	298.3	765.9
15-Oct-08	09:00	Cloudy	299.3	765.4
16-Oct-08	13:00	Sunny	302.7	761.5
21-Oct-08	09:00	Sunny	299.6	764.5
22-Oct-08	11:00	Sunny	299.6	763.3
23-Oct-08	09:00	Sunny	299.9	763.8
28-Oct-08	10:05	Sunny	299.1	766.5
29-Oct-08	09:00	Cloudy	299.9	764.5
31-Oct-08	09:00	Sunny	300.0	765.2
3-Nov-08	13:00	Cloudy	297.2	764.7
4-Nov-08	09:00	Cloudy	296.9	766.1
6-Nov-08	09:00	Cloudy	299.2	764.1
10-Nov-08	09:00	Sunny	291.9	768.1
11-Nov-08	10:00	Sunny	291.1	761.5

Date	Sampling	Weather	Air	Atmospheric
	Time	Condition	Temp. (K)	Pressure (Pa)
14-Nov-08	10:30	Sunny	296.7	767.1
18-Nov-08	09:00	Cloudy	294.2	767.5
19-Nov-08	08:00	Cloudy	290.0	771.8
20-Nov-08	10:00	Sunny	289.1	772.2
25-Nov-08	09:00	Sunny	293.9	770.4
26-Nov-08	10:30	Sunny	292.3	769.7
27-Nov-08	09:00	Sunny	292.7	770.9
2-Dec-08	09:00	Cloudy	289.1	769.0
3-Dec-08	09:00	Cloudy	292.1	766.0
5-Dec-08	09:00	Cloudy	289.6	772.5
8-Dec-08	09:00	Sunny	289.1	770.5
9-Dec-08	09:00	Sunny	288.1	768.2
11-Dec-08	09:00	Sunny	290.0	767.5
15-Dec-08	09:00	Sunny	288.7	767.0
18-Dec-08	09:00	Sunny	290.0	769.4
19-Dec-08	10:30	Sunny	291.5	769.4
22-Dec-08	09:00	Sunny	288.9	771.5
23-Dec-08	09:00	Sunny	283.1	772.7
24-Dec-08	11:45	Sunny	288.4	769.5
30-Dec-08	09:00	Cloudy	288.0	768.7
31-Dec-08	09:00	Sunny	285.1	771.2
2-Jan-09	09:00	Cloudy	289.1	770.8
5-Jan-09	15:00	Sunny	293.5	766.5
7-Jan-09	09:00	Sunny	288.0	770.8
9-Jan-09	09:00	Sunny	283.1	774.3
12-Jan-09	09:00	Sunny	283.3	774.8
14-Jan-09	09:00	Sunny	282.1	776.5
15-Jan-09	10:30	Sunny	283.5	775.9
19-Jan-09	09:00	Sunny	291.6	767.3
21-Jan-09	09:30	Sunny	291.3	767.5
22-Jan-09	09:00	Sunny	290.2	764.8
29-Jan-09	10:00	Cloudy	289.0	760.2
29-Jan-09	11:00	Sunny	289.1	760.1
30-Jan-09	09:00	Sunny	287.7	766.6
2-Feb-09	10:00	Sunny	290.3	768.8
3-Feb-09	09:00	Sunny	289.5	767.8
6-Feb-09	13:00	Sunny	294.4	766.9
9-Feb-09	09:00	Sunny	292.6	767.4
11-Feb-09	09:00	Sunny	292.2	765.3
12-Feb-09	09:00	Sunny	292.3	761.0
17-Feb-09	09:00	Cloudy	291.0	767.9
18-Feb-09	14:00	Cloudy	294.1	764.1
19-Feb-09	09:00	Cloudy	291.1	764.8
23-Feb-09	09:00	Cloudy	294.2	762.7
24-Feb-09	09:00	Cloudy	295.0	762.7
25-Feb-09	09:00	Cloudy	294.9	763.6
2-Mar-09	09:00	Cloudy	290.3	767.5
3-Mar-09	09:00	Cloudy	290.7	766.6
5-Mar-09	09:00	Cloudy	291.5	761.5
9-Mar-09	09:00	Cloudy	288.3	766.7

Date	Sampling	Weather	Air	Atmospheric
	Time	Condition	Temp. (K)	Pressure (Pa)
10-Mar-09	09:00	Cloudy	290.6	767.1
13-Mar-09	09:00	Cloudy	294.0	764.1
17-Mar-09	09:00	Sunny	293.6	764.8
19-Mar-09	09:30	Cloudy	293.9	763.3
20-Mar-09	09:00	Cloudy	296.7	762.9
24-Mar-09	09:00	Cloudy	292.1	763.9
25-Mar-09	11:00	Cloudy	291.4	765.7
26-Mar-09	13:00	Cloudy	291.1	764.9
31-Mar-09	13:00	Cloudy	294.4	765.8
1-Apr-09	16:15	Cloudy	294.7	766.2
3-Apr-09	09:00	Cloudy	291.8	767.1
6-Apr-09	13:00	Cloudy	290.4	764.7
8-Apr-09	09:00	Cloudy	292.9	766.3
9-Apr-09	09:00	Cloudy	294.3	766.7
14-Apr-09	10:30	Cloudy	297.1	766.7
15-Apr-09	09:00	Cloudy	297.0	761.4
16-Apr-09	13:00	Cloudy	297.2	755.7
21-Apr-09	09:00	Sunny	297.9	758.3
22-Apr-09	13:00	Cloudy	294.9	759.8
23-Apr-09	09:00	Cloudy	295.2	761.8
27-Apr-09	09:00	Cloudy	293.6	765.3
28-Apr-09	11:00	Sunny	295.5	765.3
30-Apr-09	09:00	Sunny	295.9	765.4
4-May-09	15:00	Sunny	298.5	762.1
5-May-09	09:00	Cloudy	297.2	764.5
6-May-09	09:00	Cloudy	295.3	763.1
11-May-09	09:00	Sunny	298.1	762.1
12-May-09	09:00	Sunny	300.9	761.8
14-May-09	09:00	Sunny	298.0	761.8
18-May-09	09:00	Sunny	301.3	760.6
20-May-09	09:00	Cloudy	301.7	759.0
21-May-09	14:00	Cloudy	301.9	759.6
26-May-09	09:00	Cloudy	297.7	759.7
27-May-09	14:00	Rainy	298.4	757.4
29-May-09	09:00	Cloudy	292.9	761.9
2-Jun-09	09:10	Sunny	299.3	756.6
3-Jun-09	09:00	Cloudy	300.4	753.8
4-Jun-09	09:00	Cloudy	299.3	752.6
8-Jun-09	09:00	Sunny	300.3	757.4
9-Jun-09	09:00	Cloudy	299.6	757.9
11-Jun-09	09:00	Cloudy	298.9	757.3
15-Jun-09	09:00	Cloudy	298.4	757.4
16-Jun-09	09:00	Cloudy	299.2	758.4
19-Jun-09	09:30	Cloudy	301.4	755.6
23-Jun-09	09:00	Cloudy	302.9	756.6
25-Jun-09	10:00	Cloudy	302.1	756.3
26-Jun-09	09:00	Cloudy	301.4	756.4
30-Jun-09	09:00	Cloudy	303.3	759.6
2-Jul-09	09:00	Cloudy	303.3	757.9
3-Jul-09	09:00	Sunny	301.7	756.5

Appendix D - Weather Condition during TSP Monitoring

Date	Sampling	Weather	Air	Atmospheric
	Time	Condition	Temp. (K)	Pressure (Pa)
7-Jul-09	09:00	Sunny	300.4	760.6
8-Jul-09	09:00	Sunny	302.6	758.3
9-Jul-09	09:00	Sunny	302.4	759.2
13-Jul-09	09:00	Sunny	303.3	756.5
14-Jul-09	09:00	Sunny	302.3	756.0
16-Jul-09	09:00	Sunny	302.4	756.9
20-Jul-09	09:00	Cloudy	301.1	758.7
21-Jul-09	09:00	Sunny	302.5	760.0
24-Jul-09	10:00	Sunny	301.5	755.5
28-Jul-09	09:00	Cloudy	299.8	754.7
29-Jul-09	09:00	Cloudy	302.1	755.6
30-Jul-09	10:30	Cloudy	301.2	755.5
4-Aug-09	09:00	Cloudy	300.9	750.2
5-Aug-09	15:00	Cloudy	300.8	750.1
6-Aug-09	11:00	Cloudy	300.9	750.7
11-Aug-09	09:30	Cloudy	299.4	755.5
12-Aug-09	09:00	Cloudy	300.3	757.0
13-Aug-09	09:00	Cloudy	298.4	757.9
17-Aug-09	09:00	Cloudy	302.2	761.4
18-Aug-09	09:00	Cloudy	302.1	761.2
21-Aug-09	09:00	Sunny	302.6	760.0
25-Aug-09	13:00	Cloudy	302.9	759.0
27-Aug-09	09:00	Sunny	304.1	759.2
28-Aug-09	11:30	Sunny	303.5	759.1
1-Sep-09	09:00	Sunny	301.9	759.6
2-Sep-09	09:00	Sunny	302.9	759.1
3-Sep-09	11:00	Sunny	303.8	756.9
8-Sep-09	09:00	Sunny	302.6	759.1
9-Sep-09	10:00	Sunny	300.8	758.6
10-Sep-09	09:00	Cloudy	302.2	758.4
15-Sep-09	16:00	Cloudy	300.1	755.1
17-Sep-09	09:00	Cloudy	301.2	762.3
18-Sep-09	09:00	Sunny	302.6	760.9
21-Sep-09	09:00	Sunny	302.4	760.0
23-Sep-09	09:00	Sunny	300.1	760.4
24-Sep-09	09:00	Sunny	302.5	760.3
28-Sep-09	11:00	Cloudy	302.3	756.2
29-Sep-09	09:00	Cloudy	297.6	757.0
2-Oct-09	09:00	Sunny	300.6	761.5
5-Oct-09	10:00	Sunny	299.3	760.6
6-Oct-09	13:00	Sunny	302.4	757.5
8-Oct-09	13:00	Sunny	300.9	758.1
13-Oct-09	10:00	Sunny	299.6	764.3
14-Oct-09	13:00	Cloudy	301.5	764.2
15-Oct-09	14:00	Cloudy	300.6	763.1
20-Oct-09	10:00	Cloudy	296.8	762.4
22-Oct-09	09:00	Cloudy	298.4	764.1
23-Oct-09	09:00	Cloudy	298.4	762.3
27-Oct-09	10:00	Sunny	298.0	765.4
29-Oct-09	09:00	Sunny	298.2	766.9
30-Oct-09	09:00	Sunny	297.9	766.2

Date	Sampling	Weather	Air	Atmospheric
	Time	Condition	Temp. (K)	Pressure (Pa)
3-Nov-09	09:00	Sunny	289.1	773.8
5-Nov-09	09:00	Cloudy	294.4	768.5
6-Nov-09	11:00	Sunny	297.2	765.1
9-Nov-09	09:00	Sunny	297.9	761.1
10-Nov-09	10:00	Sunny	300.9	768.5
12-Nov-09	13:00	Cloudy	299.9	761.2
17-Nov-09	09:00	Cloudy	283.9	770.8
18-Nov-09	14:00	Cloudy	285.4	769.1
19-Nov-09	09:00	Sunny	284.0	772.4
24-Nov-09	13:00	Sunny	296.7	762.7
25-Nov-09	09:00	Sunny	294.3	766.7
26-Nov-09	09:00	Sunny	294.1	766.3
30-Nov-09	15:00	Cloudy	296.6	765.4

Appendix D - Weather Condition during TSP Monitoring

24-hour TSP Monitoring at Station AM1 - Rooftop of Block A, Government Dockyard

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)
19-Jul-08	Sunny	303.3	757.0
25-Jul-08	Sunny	303.6	758.5
31-Jul-08	Sunny	302.6	758.5
7-Aug-08	Cloudy	300.5	754.1
12-Aug-08	Sunny	300.1	760.2
18-Aug-08	Sunny	302.1	759.9
23-Aug-08	Rainy	297.7	756.3
29-Aug-08	Sunny	303.1	759.8
4-Sep-08	Cloudy	301.1	760.6
10-Sep-08	Sunny	302.9	760.1
16-Sep-08	Sunny	303.2	757.5
22-Sep-08	Sunny	303.9	756.1
27-Sep-08	Sunny	302.6	760.7
3-Oct-08	Cloudy	299.7	761.3
9-Oct-08	Sunny	301.3	764.0
15-Oct-08	Sunny	299.6	765.0
21-Oct-08	Sunny	299.8	764.2
27-Oct-08	Sunny	300.1	766.9
1-Nov-08	Sunny	299.6	765.1
7-Nov-08	Sunny	299.6	763.6
13-Nov-08	Sunny	293.6	767.9
19-Nov-08	Sunny	290.3	771.5
25-Nov-08	Sunny	294.4	770.1
1-Dec-08	Sunny	290.4	771.6
6-Dec-08	Sunny	287.9	773.7
12-Dec-08	Sunny	292.9	766.0
18-Dec-08	Sunny	290.3	769.2
23-Dec-08	Sunny	283.5	772.3
29-Dec-08	Cloudy	292.7	766.7
2-Jan-09	Sunny	290.7	768.5
8-Jan-09	Sunny	285.1	772.7
14-Jan-09	Sunny	282.3	776.3
20-Jan-09	Sunny	289.9	767.0
24-Jan-09	Sunny	282.5	773.4
30-Jan-09	Sunny	292.9	763.8
5-Feb-09	Sunny	291.2	767.5
11-Feb-09	Sunny	292.5	764.9
17-Feb-09	Cloudy	291.4	767.6
23-Feb-09	Cloudy	294.9	762.3
28-Feb-09	Cloudy	293.1	766.0
6-Mar-09	Cloudy	288.1	764.5
12-Mar-09	Cloudy	291.8	765.8
18-Mar-09	Cloudy	293.7	763.3
24-Mar-09	Cloudy	292.6	763.5
30-Mar-09	Cloudy	290.2	767.1

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)
3-Apr-09	Cloudy	292.4	766.5
9-Apr-09	Cloudy	294.8	766.3
15-Apr-09	Cloudy	297.6	760.9
21-Apr-09	Cloudy	298.6	757.9
27-Apr-09	Sunny	293.8	765.1
2-May-09	Sunny	297.2	764.8
8-May-09	Sunny	295.4	761.8
14-May-09	Sunny	299.6	761.5
20-May-09	Cloudy	302.3	758.4
26-May-09	Rainy	297.9	759.5
1-Jun-09	Sunny	298.6	758.7
6-Jun-09	Sunny	300.7	756.4
12-Jun-09	Cloudy	298.9	757.3
18-Jun-09	Cloudy	302.3	756.6
24-Jun-09	Cloudy	300.1	757.4
30-Jun-09	Cloudy	303.7	759.0
6-Jul-09	Sunny	299.4	760.4
11-Jul-09	Sunny	303.4	754.3
17-Jul-09	Sunny	303.7	756.1
23-Jul-09	Sunny	300.7	757.2
29-Jul-09	Cloudy	302.3	755.4
4-Aug-09	Cloudy	301.4	749.5
10-Aug-09	Cloudy	305.2	751.4
15-Aug-09	Sunny	299.4	759.9
21-Aug-09	Sunny	303.9	759.3
27-Aug-09	Sunny	304.3	759.0
2-Sep-09	Sunny	303.1	758.9
8-Sep-09	Sunny	303.1	758.7
14-Sep-09	Cloudy	300.3	756.8
19-Sep-09	Sunny	303.3	759.2
25-Sep-09	Sunny	302.4	760.9
2-Oct-09	Sunny	301.0	760.9
7-Oct-09	Sunny	301.3	760.1
13-Oct-09	Sunny	299.9	759.9
19-Oct-09	Cloudy	299.2	761.2
24-Oct-09	Sunny	299.1	761.9
30-Oct-09	Cloudy	300.1	763.8
5-Nov-09	Sunny	294.6	768.3
11-Nov-09	Cloudy	299.6	759.3
17-Nov-09	Cloudy	284.7	770.3
23-Nov-09	Sunny	291.1	768.4
28-Nov-09	Sunny	295.2	767.9

APPENDIX E
EVENT ACTION PLANS

APPENDIX E – Event / Action Plan

Table D-1 Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1.Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contractor, IEC and ER; 3. Repeat measurement to confirm finding. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; and 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; and 2. Amend working methods if appropriate.
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contractor, IEC and ER; 3. Increase monitoring frequency to daily; 4. Discuss with IEC and Contractor on remedial actions required; 5. Assess the effectiveness of Contractor's remedial actions; 6. If exceedance continues, arrange meeting with IEC and ER; and 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; and 4. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; and 5. Conduct meeting with ET and IEC if exceedance continues. 	<ol style="list-style-type: none"> 1. Discuss with ET and IEC on proper remedial actions; 2. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1.Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Inform Contractor, IEC, ER and EPD; 3. Repeat measurement to confirm finding; and 4. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; and 4. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; and 5. Conduct meeting with ET and IEC if exceedance continues. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on proper remedial actions; 3. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; and 4. Implement the agreed proposals.
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Carry out analysis of Contractor's working procedures to investigate the causes of exceedance; 4. Increase monitoring frequency to daily; 5. Arrange meeting with IEC, ER and Contractor to discuss the remedial actions to be taken; 6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results; and 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ER, ET and Contractor on possible remedial measures; and 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; and 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Discuss with ET, ER and IEC on proper remedial actions; 3. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposals for remedial actions if problem still not under control; and 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Table D-2 Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level being exceeded	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; and 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; and 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; and 4. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposal to IEC and ER; and 2. Implement noise mitigation proposals.
Limit Level being exceeded	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; and 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; and 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposal for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; and 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

**APPENDIX F
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)**

APPENDIX F - Environmental Mitigation Implementation Schedule (EMIS)

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S3.29	<p>Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be incorporated to control dust emission from the site. Control measures relevant to this Project are listed below:</p> <ul style="list-style-type: none"> • Skip hoist for material transport should be totally enclosed by impervious sheeting; • Vehicle washing facilities should be provided at every vehicle exit point; • The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore; • Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit; • Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather; • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines; • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs; • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations; • Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per 	Work sites / During the construction period	Contractor		√			EIAO-TM and Air Pollution Control (Construction Dust) Regulation

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>hour is the recommended limit;</p> <ul style="list-style-type: none"> • Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides; • Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites; and • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 							
S4.48 – S4.50	Use of quiet PME	Work sites / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance
S4.51	<p><i>Good Site Practice</i></p> <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. 	Work sites / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S4.56 & S13	Noise monitoring should be carried out to ensure that noise mitigation measures would be properly implemented. Details of the monitoring requirements are specified in the EM&A Manual.	Barrack / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance
S5.212	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted. It is recommended to install perimeter channels in the works areas to intercept runoff at site boundary prior to the commencement of any earthwork. To prevent storm runoff from washing across exposed soil surfaces, intercepting channels should be provided. Drainage channels are also required to convey site runoff to sand/silt traps and oil interceptors. Provision of regular cleaning and maintenance can ensure the normal operation of these facilities throughout the construction period. Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.213	There is a need to apply to EPD for a discharge licence under the WPCO 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 all the standards listed in the TM-DSS. Reuse and recycling of the treated effluent can minimise water consumption and reduce the effluent discharge volume. The beneficial uses of the treated effluent may include dust suppression, wheel washing and general cleaning. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.214	The construction programme should be properly planned to minimise 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 minimise 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 times. The stockpiles of materials should be placed at 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 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.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.215	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 spreading from the site area. It is recommended to clean the construction sites on a regular basis.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.216	The presence of construction workers generates sewage. It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should be more 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 SCISTW as necessary.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.217	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. Regular 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 anticipated that sewage generation during the construction phase of the project would not cause water pollution problem after undertaking all required measures.	Work sites / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.218	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Work sites / During the construction period	Contractor		√			EIAO-TM and Waste Disposal Ordinance
S5.219	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Work sites / During the construction period	Contractor		√			EIAO-TM, Waste Disposal Ordinance and Water Pollution Control Ordinance
S5.220	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul 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 labeled, to notify and warn the personnel who are handling the wastes, to avoid accidents. 	Work sites / During the construction period	Contractor		√			EIAO-TM and Waste Disposal Ordinance

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<ul style="list-style-type: none"> Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 							
S10.21	<p><i>Good Site Practices</i></p> <p>Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site Training of site personnel in proper waste management and chemical handling procedures Provision of sufficient waste disposal points and regular collection of waste Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. 	Work sites / During the construction period	Contractor		√			Waste Disposal Ordinance (Cap.54) ETWB TCW No. 19/2005

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S10.22	<p><i>Waste Reduction Measures</i></p> <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 • Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce • Proper storage and site practices to minimise the potential for damage or contamination of construction materials • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. • A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle. 	Work sites / During planning & design stage, and construction stage	Contractor	√	√			
S10.24	<p><i>General Refuse</i></p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	Work sites / During the construction period	Contractor		√			Public Health and Municipal Services Ordinance (Cap. 132)

EIA Ref	Environmental Protection Measures/Mitigation Measures	Location/Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S10.25	<p><i>Construction and Demolition Material</i></p> <p>In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated material generated from excavation works for the proposed chlorination plant, dechlorination plant, day tank and pipe trenches should be reused on-site as backfilling material as far as practicable. The surplus excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. C&D waste generated from site clearance and dismantling of formwork would require disposal to the designated landfill site. In order to monitor the disposal of C&D material at the public fill reception facility and landfill and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No. 31/2004 for details.</p>	Work sites / During design stage and construction period	Contractor	√	√			ETWB TCW No. 33/2002 ETWB TCW No. 19/2005
S10.26	<p><i>Chemical Waste</i></p> <p>If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Work sites / During the construction period	Contractor		√			Waste Disposal (Chemical Waste) (General) Regulation

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.

* Des - Design, C - Construction, O – Operation, and Dec - Decommissioning

**APPENDIX G
COMPLAINT LOG**

APPENDIX G – Complaint Log

Project Period: July 2008 to December 2009

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 from July 2008 to December 2009.

**APPENDIX H
WASTE FLOW TABLE**

Monthly Summary Waste Flow Table For 2008 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Waste Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 2)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 1)	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 '000m ³)
Jan											
Feb											
Mar											
Apr											
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060
July	0.400	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.000
Aug	0.654	0.000	0.000	0.000	0.654	0.000	0.000	0.000	0.000	0.000	0.000
Sep	1.250	0.000	0.000	0.000	1.250	0.000	0.000	0.000	0.000	0.000	0.000
Oct	1.765	0.000	0.000	0.000	1.765	0.000	0.000	0.000	0.000	0.000	0.000
Nov	0.080	0.000	0.000	0.000	0.080	0.000	0.000	0.000	0.000	0.000	0.040
Dec	0.475	0.000	0.000	0.000	0.475	0.000	0.000	0.000	0.000	0.000	0.000
Total	4.624	0.000	0.000	0.000	4.624	0.000	0.000	0.000	0.000	0.000	0.100

- Notes: (1) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(2) Broken concrete for recycling into aggregates.

Appendix H

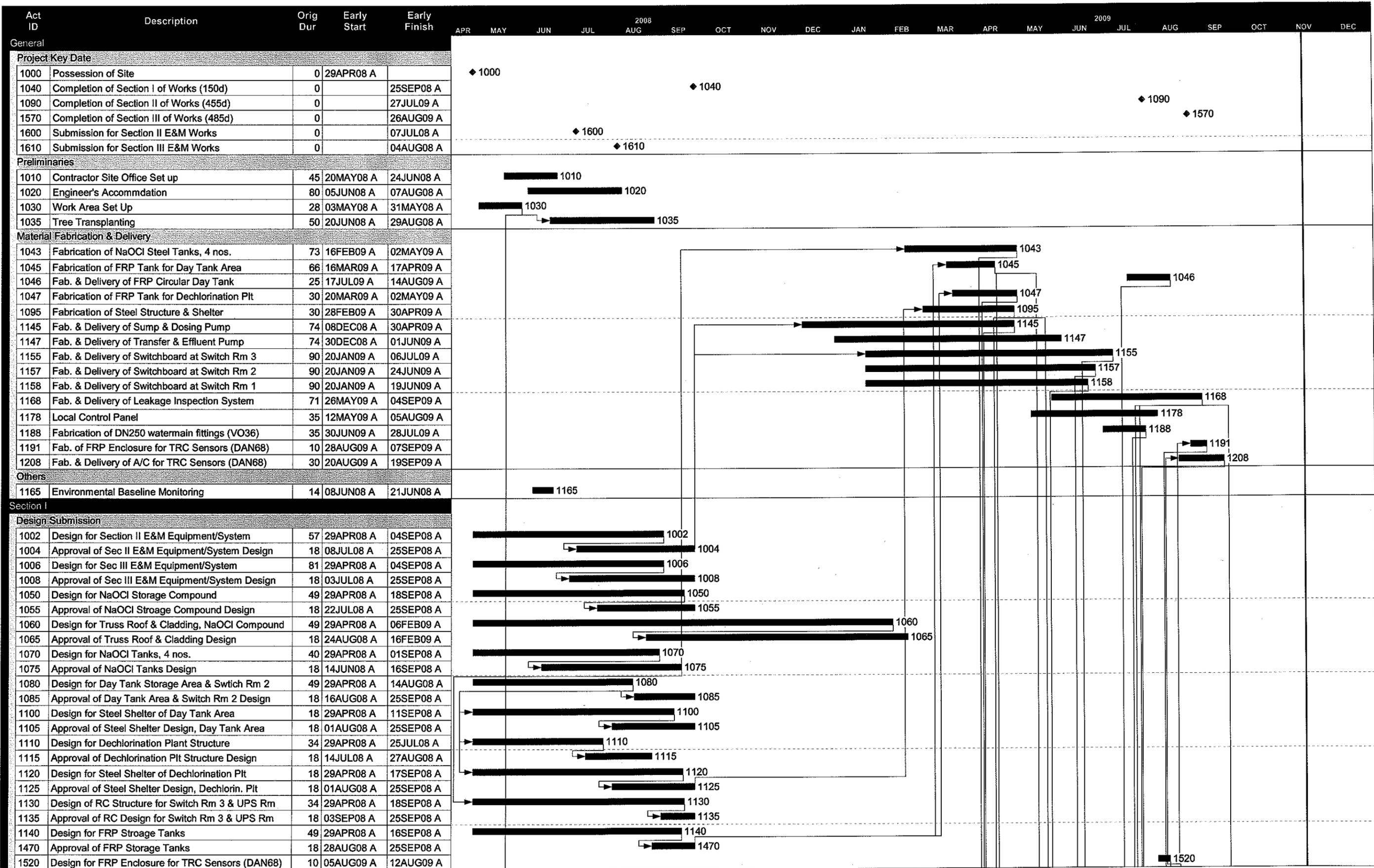
Contract No.: DC/2007/20

Monthly Summary Waste Flow Table For 2009 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Waste Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 2)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 1)	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 '000m ³)
Jan	0.11	0	0	0	0.11	0	0	0	0	0	
Feb	0.125	0	0	0	0.125	0	0	0	0	0	
Mar	0.16	0	0	0	0.16	0	0	0	0	0.02	
Apr	0.075	0	0	0	0.075	0	0	0	0	0	
May	0.25	0	0	0	0.25	0	0	0	0	0.03	
Jun	0.025	0	0	0	0.025	0	0	0	0	0.001	
Sub-total	0.745	0	0	0	0.745	0	0	0	0	0.051	
July	0.15	0	0	0	0.15	0	0	0	0	0.005	
Aug	0.06	0	0	0	0.06	0	0	0	0	0.02	
Sep	0.229	0	0	0	0.229	0	0	0	0	0.001	
Oct	0.041	0	0	0	0.041	0	0	0	0	0.002	
Nov	0	0	0	0	0	0	0	0	0	0.003	
Dec	0	0	0	0	0	0	0	0	0	0.003	
Total	1.225	0	0	0	1.225	0	0	0	0	0.085	

- Notes: (1) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 (2) Broken concrete for recycling into aggregates.

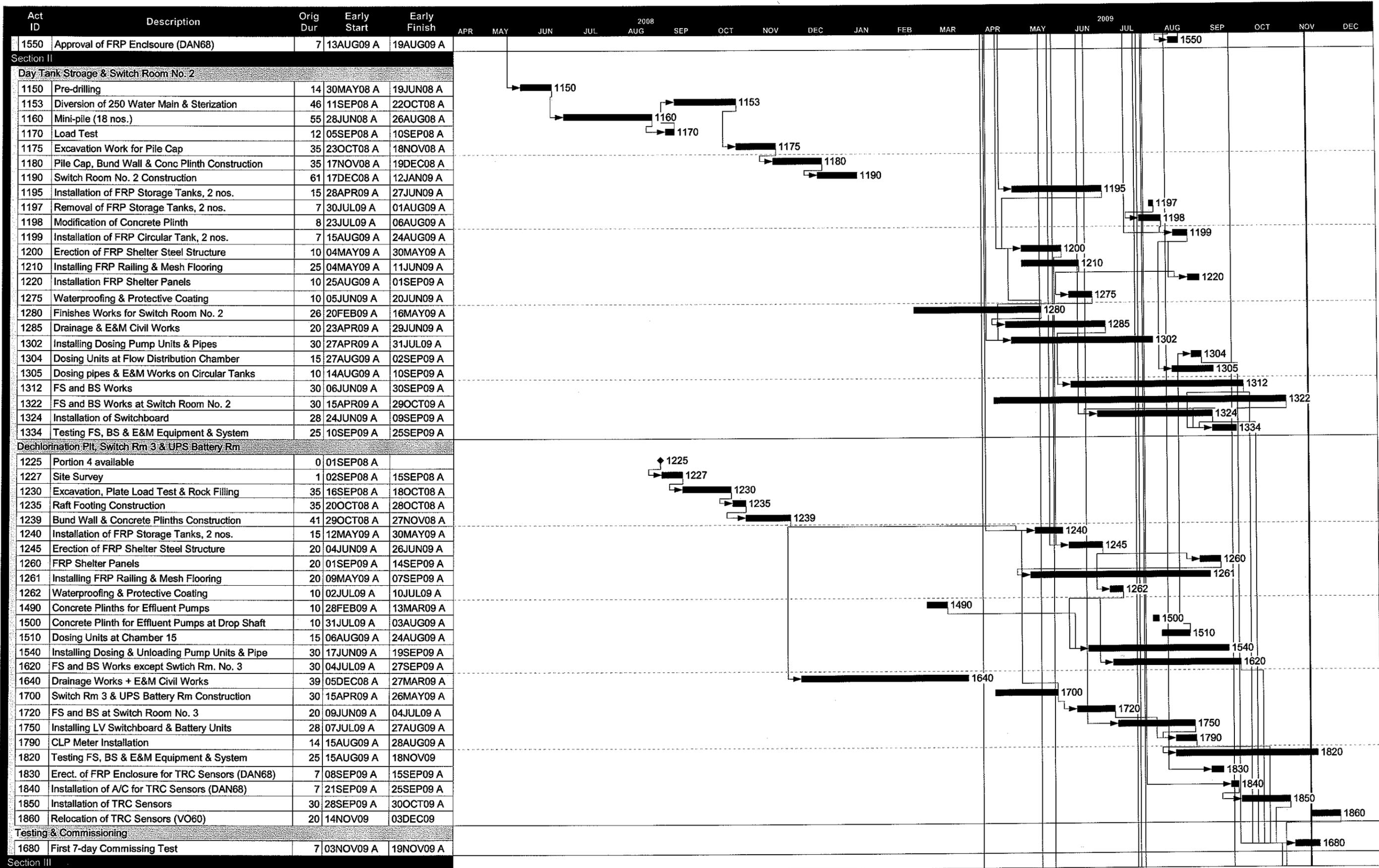
APPENDIX I
Construction Programme



Start date	29APR08	■	Early bar
Finish date	14DEC09	■	Progress bar
Data date	14NOV09	■	Critical bar
Run date	16NOV09	■	Summary bar
Page number	1A	◆	Start milestone point
c Primavera Systems, Inc.		◆	Finish milestone point

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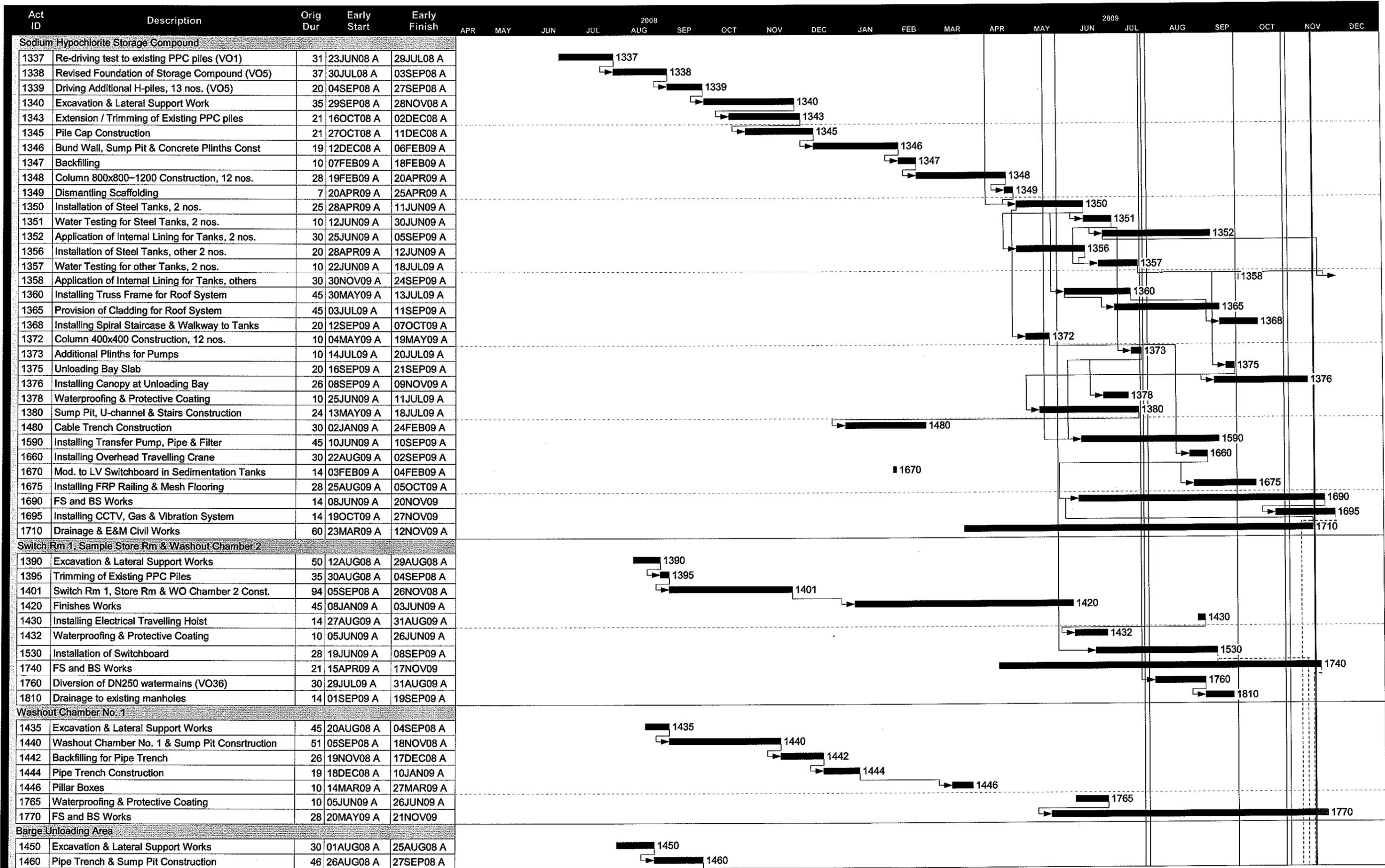
Date	Revision	Checked	Approved
11SEP08	C	Tim	
30MAR09	D	Aaron	
30JUN09	E	Aaron	
15NOV09	F	Aaron	



Start date	29APR08	■	Early bar
Finish date	14DEC09	■	Progress bar
Data date	14NOV09	■	Critical bar
Run date	16NOV09	—	Summary bar
Page number	2A	◆	Start milestone point
c Primavera Systems, Inc.		◆	Finish milestone point

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Date	Revision	Checked	Approved
11SEP08	C	Tim	
30MAR09	D	Aaron	
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15NOV09	F	Aaron	



Start date	29APR08		Early bar
Finish date	14DEC09		Progress bar
Data date	14NOV09		Critical bar
Run date	16NOV09		Summary bar
Page number	3A		Start milestone point
c Primavera Systems, Inc.			Finish milestone point

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Date	Revision	Checked	Approved
11SEP08	C	Tim	
30MAR09	D	Aaron	
30JUN09	E	Aaron	
15NOV09	F	Aaron	

