China Harbour Engineering Company Limited

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

Monthly Environmental Monitoring and Audit Report for January 2014

(Version 1.0)

Certified By -	Chu (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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EXECUTIVE SUMMARY

Introduction

- 1. This is the 43rd monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract no. DC/2009/09 "Construction of Tai Po Sewage Treatment Works – Stage V Phase IIB". This report documents the findings of EM&A Works conducted in January 2014.
- 2. The major site activities undertaken in the reporting month included:
 - Cable ducting works ;
 - Water tightness test and air test for Sludge Digestion Tank No.3;
 - Drainage works along Aeration Tank No.6 to Effluent Launder;
 - Finishing works for Mixed Liquor Channel;
 - Landscaping works; and
 - Modification works at switch room of RAS Pumping Station, Central Building Complex and Inlet Works.

Environmental Monitoring and Audit Works

- 3. Environmental monitoring and audit works for the Project were performed regularly as stipulated in the Final 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 month is tabulated in **Table I**.

 Table I
 Summary Table for Events Recorded in the Reporting Month

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

1

5. In the reporting month, excavation works were undertaken within the 250m Consultation Zone of Shuen Wan Landfill. All the excavation works that at 1m depth or more have been finished or backfilled. No landfill gas monitoring was necessary in the reporting month.

Environmental Licenses and Permits

6. 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.

Key Information in the Reporting Month

7. Summary of key information in this reporting month is tabulated in **Table II**.

 Table II
 Summary Table for Key Information in the Reporting Month

Event	-	Event Details	Action Taken	Status	Remark
Event	Number	Nature	Action Taken	Status	кетагк
Complaint received	0		N/A	N/A	
Changes to the assumptions and key construction / operation activities recorded	0		N/A	N/A	
Status of submissions under EP	1	Monthly EM&A Report (December 2013)	Submitted to EPD on 20 th January 2014 (EP condition 6.6)	N/A	
Notifications of any summons & prosecutions	0		N/A	N/A	

Future Key Issues

- 8. Major site activities for the coming two months will include:
 - Cable ducting works;
 - Drainage and Road works;
 - Landscaping works;
 - Modification works at CBC;
 - Modification works of Effluent Launder and Flow Splitter Box;
 - Modification works at Inlet Works; and
 - Construction of Steel Bridge and backfilling for Sludge Digestion Tank No. 3.
- 9. The future environmental concerns are air quality, noise impacts, waste management and surface runoff from construction works.

1 INTRODUCTION

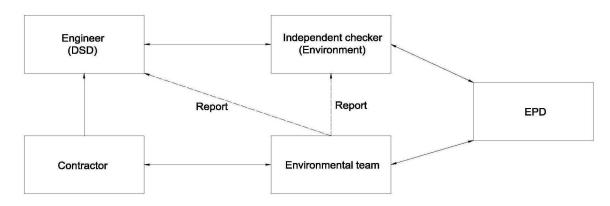
Background

- 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 M. 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 Limited. was appointed as the IEC under Condition 2.2 of the EP. This is the 43rd monthly EM&A report summarizing the EM&A works for the Project in January 2014.

Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
 - Project Proponent / Engineer's Representative (ER) Drainage Services Department
 - Environmental Team (ET) Cinotech Consultants Ltd.
 - Independent Environmental Checker (IEC) Ove Arup and Partners Hong Kong Limited
 - Contractor 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**.

Party	Role	Name	Position	Phone No.	Fax No.
		Mr. LAI cheuk-ho	Chief Engineer	2594 7500	
DSD	SP Division	Mr. IP Shu-kuen	Senior Engineer	2594 7502	2827 8700
		Mr. TSANG Lap-kei	Engineer	2594 7459	
		Dr. Priscilla CHOY	ET Leader	2151 2089	
Cinotech	Environmental Team	Mr. Edmond Put	Project Coordinator and Audit Team Leader	2151 2035	3107 1388
	Mr. Henry LEUNG	Monitoring Team Leader	2151 2087		
٨	Independent Environmental	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2865 6493
Arup	Checker	Mr. Ken LEE	Assistant to Independent Environmental Checker	2268 3573	2803 0493
		Mr. TK CHEUNG	Project Manager	9863 2954	
CHEC	CHEC Civil Contractor	Mr. Aaron AU	Site Agent	6345 0754	2603 6899
		Mr. Jason TSE	Environmental Officer	6628 5739	

Table 1.1Key Project Contacts

Construction Programme

- 1.9 The site activities undertaken in the reporting month were:
 - Cable ducting works ;
 - Water tightness test and air test for Sludge Digestion Tank No.3;
 - Drainage works along Aeration Tank No.6 to Effluent Launder;
 - Finishing works for Mixed Liquor Channel;
 - Landscaping works; and
 - Modification works at switch room of RAS Pumping Station, Central Building Complex and Inlet Works.

Summary of EM&A Requirements

- 1.10 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 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 5 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 month.

2 AIR QUALITY MONITORING

Monitoring Requirements

- 2.1 Monitoring of 1-hour and 24-hour Total Suspended Particulates (TSP) was conducted to monitor the air quality during construction phase. Appendix A shows the established Action/Limit Levels for the environmental monitoring works.
- 2.2 In accordance with Section 2.30 of the EM&A Manual, a baseline checking of ambient TSP levels shall be carried out every six months at each monitoring station, when no dusty works activities are in operation. The number and location of monitoring stations and parameters shall be reviewed by ET Leader every three months according to section 8.8 of EM&A Manual.

Monitoring Locations

2.3 Impact air quality monitoring was conducted at the 3 monitoring stations, as shown in **Figure 1.2**. **Table 2.1** describes the locations of the air quality monitoring stations.

Monitoring Stations	Description	Location of Measurement
CAM1	Government Staff Quarters	Rooftop
CAM2	Hung Hing Printing Centre	On the site boundary just next to the Hung Hing Printing Centre
CAM3	Talcon Industrial Ltd.	On the site boundary just next to Talcon Industrial Ltd.

Table 2.1Locations for Air Quality Monitoring

Monitoring Equipment

2.4 **Table 2.2** summarizes the equipment used for the air quality monitoring.

Table 2.2Air Quality Monitoring Equipment

Equipment	Model and Make	Qty.
IN/C	Graseby GMW 2310 HVS, Model GS-2310105-1, Serial no. 10239 and 0810	2
HVS	Tisch Environmental, Inc.; Model no. TE-5170, Serial no. 1704	1
Calibrator	Thermo Andersen.; Model no. G25A Serial no. 1536	

Monitoring Parameters, Frequency and Duration

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

Monitoring Stations	Parameter	Duration	Period	Frequency
CAM1, CAM2 and	1-hour TSP	1 hour	During daytime period	3 times / 6-day
CAM3	24-hour TSP	24 hours	24 hours	Once / 6-day

Table 2.3	Impact Dust Monitoring Parameters, Frequency and Duration
	impact Dust Monitoring Furtheres, Frequency and Duration

Monitoring Methodology and QA/QC Procedure

Instrumentation

2.6 High Volume Samplers (HVS) connected with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

HVS Installation

- 2.7 The following guidelines were adopted during the installation of HVS:
 - Sufficient support was provided to secure the samplers against gusty wind.
 - No two samplers were placed less than 2 meters apart.
 - The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
 - A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
 - A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
 - No furnaces or incineration flues were nearby.
 - Airflow around the sampler was unrestricted.
 - The samplers were more than 20 meters from the drip line.
 - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

Filters Preparation

- 2.8 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3 μ m diameter. A HOKLAS accredited laboratory, Wellab Ltd., was responsible for the preparation of pre-weighed filter papers for Cinotech's monitoring team.
- 2.9 All filters, which were prepared by Wellab Ltd., were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
- 2.10 Wellab Ltd. has a comprehensive quality assurance and quality control programmes.

Operating/Analytical Procedures

- 2.11 Operating/analytical procedures for the TSP monitoring were highlighted as follows:
 - Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 and 1.4 m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard.
 - The power supply was checked to ensure the sampler worked properly.
 - On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the air quality monitoring station.
 - The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
 - The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts to avoid air leakage at the edges.
 - The shelter lid was closed and secured with the aluminum strip.
 - The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
 - The flow rate of the HVS sampler would be verified to be constant and recorded on the data sheet after sampling.
 - After sampling, the filter was removed and sent to the Wellab Ltd. for weighing. The elapsed time was also recorded.
 - Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment should be between 25°C and 30°C and not vary by more than $\pm 3^{\circ}$ C; the relative humidity (RH) should be < 50% and not vary by more than $\pm 5\%$. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.

Maintenance/Calibration

- 2.12 The following maintenance/calibration was required for the HVS:
 - The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
 - Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. Copies of calibration certificates are attached in **Appendix B**.
 - The HVS calibration orifice will be calibrated annually.

Results and Observations

- 2.13 In the reporting month, 1-hr TSP monitoring was carried out as schedule at each designated monitoring station on 13 occasions. 24-hr TSP monitoring was carried out as scheduled at each designated monitoring station on 6 occasions. The monitoring schedule was updated and is shown in **Appendix C**. The weather during the monitoring sessions was mainly sunny and cloudy.
- 2.14 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting month.
- 2.15 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices D** and **E**, respectively.

Parameter	Minimum µg/m ³	Maximum µg/m ³	Average µg/m ³	Action Level, µg/m ³	Limit Level, µg/m ³
1-hr TSP (CAM1)	42	189	106	315	500
24-hr TSP (CAM1)	65	109	90	171	260
1-hr TSP (CAM2)	58	146	104	336	500
24-hr TSP (CAM2)	62	115	94	177	260
1-hr TSP (CAM3)	64	174	106	344	500
24-hr TSP (CAM3)	64	114	89	192	260

Table 2.4Summary Table of Air Quality Monitoring Results during the
reporting month

2.16 According to our field observations, the major dust source identified at the designated air quality monitoring stations are as follows:

Station	Major Pollution Source
CAM1 – Government Staff Quarters	Road Traffic Dust
CAM2 – Hung Hing Printing Centre	Road Traffic Dust and Excavation
CAM3 – Talcon Industrial Ltd.	Road Traffic Dust and Excavation

3 NOISE MONITORING

Monitoring Requirements

- 3.1 Noise monitoring was conducted in accordance with the EM&A Manual. Appendix A shows the established Action and Limit Levels for the environmental monitoring works.
- 3.2 The number and location of monitoring stations and parameters shall be reviewed by ET Leader every three months according to section 8.8 of EM&A Manual.

Monitoring Locations

3.3 Noise monitoring was conducted at one designated monitoring station as presented in **Table 3.1**. **Figure 1.2** shows the locations of the monitoring station.

Table 3.1Location of Noise Monitoring Station

Monitoring Station	Description	ion Location of Measurement	
NM1	Government Staff Quarters	The corridor at the first floor.	

Monitoring Equipment

3.4 **Table 3.2** summarizes the noise monitoring equipment model being used.

Table 3.2Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVANTEK - SVAN 955	1
Calibrator	SVANTEK - SV30A	1
Wind Speed Anemometer	Vane Anemometer, Model AZ8904 (Serial no. 974835)	1

Monitoring Parameters, Frequency and Duration

3.5 **Table 3.3** summarizes the monitoring parameters, frequency and total duration of monitoring.

Table 3.3Noise Monitoring Parameters, Frequency and Duration

Station	Parameter	Period	Frequency
NM1	$L_{eq}(30 \text{ min.})$ (L_{10} and L_{90} were also recorded as supplementary information)	0700-1900 hrs. on normal weekdays	Once a week

3.6 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring would be carried out during evening and night-time works. Applicable permits under NCO have been obtained by the Contractor. The details of the Construction Noise Permit can be referred to **Table 5.1**.

Monitoring Methodology and QA/QC Procedures

Field Monitoring

- 3.7 The monitoring procedures are as follows:
 - The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
 - The battery condition was checked to ensure good functioning of the meter.
 - Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting : A
 - time weighting : Fast
 - measurement time : 30 minutes
 - Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
 - The wind speed at the monitoring station was checked with the portable wind meter. Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.
 - Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
 - At the end of the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.

Maintenance and Calibration

- 3.8 Maintenance and Calibration procedures were as follows:
 - The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
 - The sound level meter and calibrator were checked and calibrated at yearly intervals. Copies of calibration certificates are attached in **Appendix B**.

Results and Observations

- 3.9 In the reporting month, noise monitoring during non-restricted hours was conducted as scheduled at the designated location on 4 occasions. As advised by the Contractor, no construction activities will be undertaken during restricted hours as such noise monitoring during restricted hours was omitted. The noise monitoring schedule is provided in **Appendix C**.
- 3.10 The details of the monitoring results and graphical presentations are shown in **Appendix F**. The weather during the monitoring sessions was mainly sunny and fine.
- 3.11 No Action/Limit Level exceedance for construction noise monitoring was recorded in the reporting month.

Table 3.4 Summary Table of Noise Monitoring Results during the Reporting Month

Parameter	Minimum L _{eq} (30min) dB(A)	Maximum L _{eq} (30min) dB(A)	Average L _{eq} (30min) dB (A)	Action Level	Limit Level
NM1	65.8	70.2	68.4	When one documented complaint is received	75dB(A)

3.12 According to our field observations, the major noise source identified at the designated air quality monitoring stations are as follows:

Station	Major Noise Source
NM1 – Government Staff Quarters	Road Traffic
	Construction of Main Site

4 LANDFILL GAS MONITORING

Monitoring Requirements

4.1 In accordance with Section 6 of the EM&A Manual, monitoring of landfill gas is required for construction works within the 250m Consultation Zone of Shuen Wan Landfill (the Consultation Zone). This Section reports the results of landfill gas measurements performed by the Safety Officer of the Contractor. Appendix A shows the Limit Levels for the monitoring works.

Monitoring Locations

4.2 Monitoring of oxygen, methane and carbon dioxide was performed for excavations at 1m depth or more within the Consultation Zone. In this reporting month, all the excavation works that at 1m depth or more have been finished or backfilled. No landfill gas monitoring was necessary in the reporting month.

5 ENVIRONMENTAL AUDIT

Site Audits

- 5.1 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix H**.
- 5.2 Site audits were conducted on 3rd, 7th, 17th, 24th and 29th January 2014 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 3rd January 2014. No site inspection was conducted by EPD during the reporting month. The details of observations during site audit can refer to **Table 5.2**.

Review of Environmental Monitoring Procedures

5.3 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 within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

Noise Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

Landfill Gas Monitoring

• The Contractor has checked the condition of the equipment before monitoring to ensure the reliability.

Status of Environmental Licensing and Permitting

5.4 All permits/licenses obtained for the Project are summarized in **Table 5.1**.

Permit / License No.		Deteile	Status	
Permit / License No.	From	То	- Details	Status
Environmental Perm	it (EP)			
EP-265/2007	22/3/2007	N/A	 Expansion and upgrading of existing <u>Tai Po Sewage Treatment Works from</u> <u>100,000 m³/day to 130,000 m³/day:</u> (a) additional secondary treatment process units(1 primary clarified; 3 bioreactors and 2 final clarifiers); (b) reconstruction of 4 existing final clarified; (c) provision of ultraviolet disinfection facilities; (d) additional sludge treatment facilities; and (e) ancillary works to existing treatment facilities. 	Valid
Consruction Noise Pe				
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.	Expired
GW-RN0614-12	01/01/13	30/06/13	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-RN0376-13	01/07/13	31/12/13	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-RN0790-13	01/01/14	30/06/14	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

Table 5.1 Summary of Environmental Licensing and Permit Status

Dormit / Liconco No	Permit / License No. Valid Period		Details	Status
r er mit / License No.	From	То	Details St	
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
Waste Disposal (Cher	nical Waste)			
WPN : 5213-727-C2397-16	09/07/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid

Status of Waste Management

5.5 The Construction and Demolition (C&D) materials generated in the reporting month were mainly metals and general refuse. The quantities of waste generated in this reporting month are summarized in **Appendix K**.

Implementation Status of Environmental Mitigation Measures

- 5.6 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the EMIS is provided in **Appendix J**.
- 5.7 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 5.2**.

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	N/A	N/A	N/A
Air Quality	17 January 2014	<u>Reminder:</u> Dusty stockpile should be removed.	The observation was observed to be improved/rectified by the Contractor during the audit session on 24 January 2014.
Noise	N/A	N/A	N/A
	3 January 2014	Reminder: Construction waste near Methane Gas Holder no.2 should be cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 7 January 2014.
Waste / Chemical Management	17 January 2014	Reminder: Construction waste should be sorted and cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 24 January 2014.
	29 January 2014	<u>Reminder:</u> Drip tray should be provided to the chemical containers.	Follow up action will be reported in next reporting period.

Table 5.2Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
	29 January 2014	<u>Reminder:</u> Chemical container not in use should be properly stored or removed.	Follow up action will be reported in next reporting period.
	29 January 2014	Reminder: Construction waste should be sorted and cleared.	Follow up action will be reported in next reporting period.
Permit/ Licenses	N/A	N/A	N/A

Summary of Exceedances

5.8 No exceedance of monitoring results was recorded in the reporting month. Summary of exceedance is provided in **Appendix G**.

Implementation Status of Event Action Plans

5.9 The Event Action Plans for air quality, construction noise and landfill gas monitoring are presented in **Appendix I**. No exceedance was recorded and thus no action was required to be implemented.

Summary of Complaint and Prosecution

- 5.10 No environmental related complaint, prosecution or notification of summons was received in the reporting month.
- 5.11 There was no environmental complaint, prosecution or notification of summon received since the Project commencement. The Complaint Log is attached in **Appendix L.**

6 FUTURE KEY ISSUES

- 6.1 Key issues to be considered in the coming month include:
 - Effluent discharge generated from surface runoff;
 - Dust generation from excavation works, backfilling works and stockpile of dusty materials;
 - Maintenance of de-silting facilities and drainage system, such as U-channels;
 - Accumulation of stagnant water in the site areas; and
 - Accumulation of C&D waste and general waste on site.

Monitoring Schedule for the Next Month

6.2 The tentative environmental monitoring schedule for the next month is shown in **Appendix C**.

Construction Program for the Next Month

- 6.3 A tentative construction programme is provided in **Appendix M**. The major construction activities in the coming month will include:
 - Cable ducting works;
 - Drainage and Road works;
 - Landscaping works;
 - Modification works at CBC;
 - Modification works of Effluent Launder and Flow Splitter Box;
 - Modification works at Inlet Works; and
 - Construction of Steel Bridge and backfilling for Sludge Digestion Tank No. 3.

7 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 7.1 Environmental monitoring and audit works were conducted in the reporting month. Site inspections were conducted on a weekly basis. The results were reviewed and checked.
- 7.2 No exceedance of monitoring results was recorded in the reporting month.
- 7.3 There was no environmental complaint, prosecution or notification of summons received.

Recommendations

7.4 According to the environmental audit performed in the reporting month, the following recommendations were made:

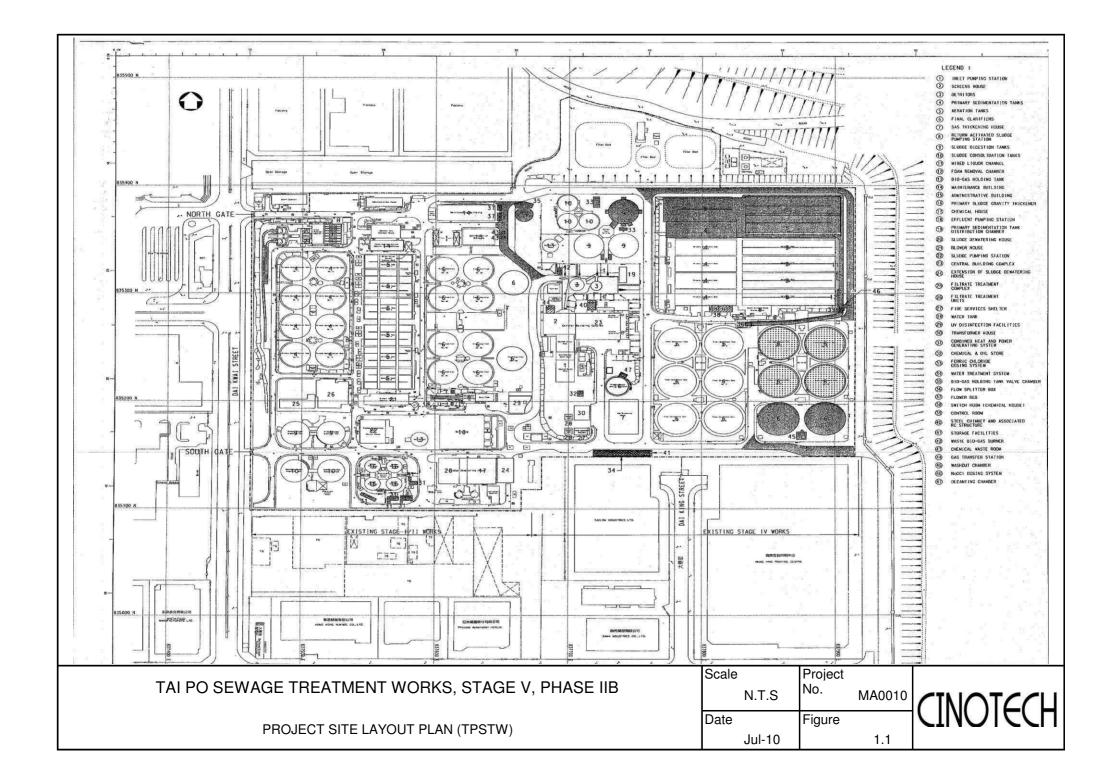
Water Impact

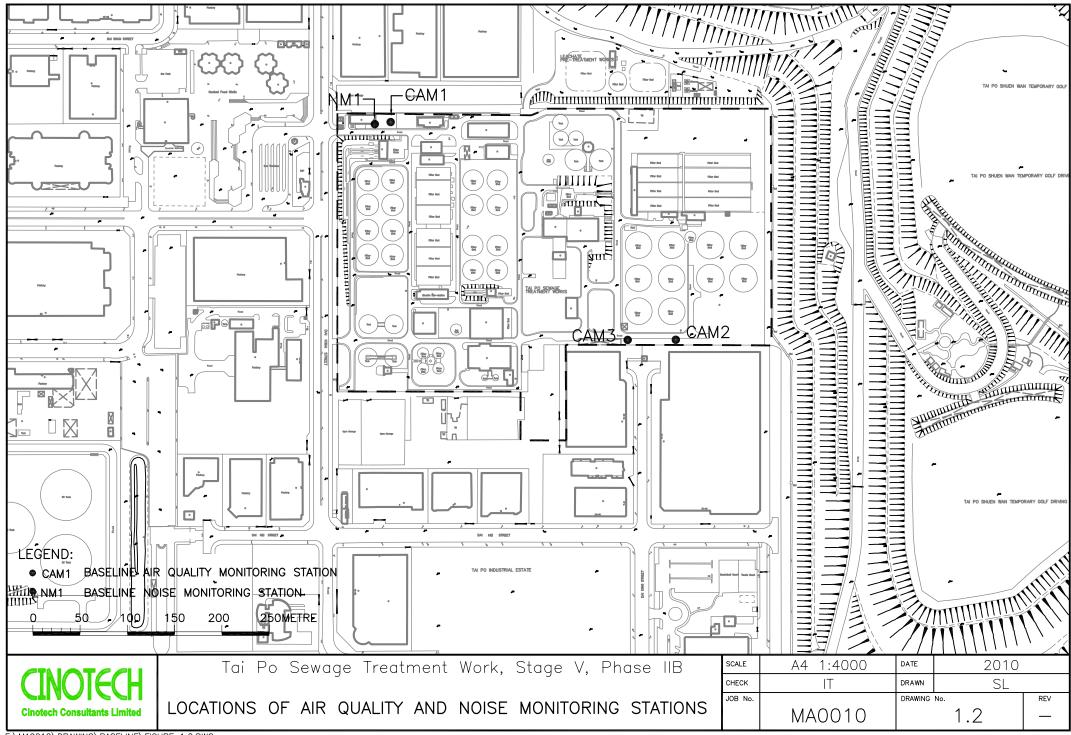
- Avoid blockage of gully inlets and ensure proper protection of the gully from ingress of sandy water.
- Ensure proper use and maintenance of the de-silting facilities.
- Provide sediment tank for settling runoff prior to disposal.
- Remove and settle out sand and silt at wheel washing facilities regularly.
- Pump out stagnant water and avoid ponding water accumulation.

Waste / Chemical Management

- Avoid accumulation of C&D waste materials or general refuse on site.
- Provide proper rubbish bins / skips for waste collection.
- Proper label the chemicals on site and store properly with drip tray.
- Sort and disposal of C & D waste and general refuse properly.

FIGURES





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

APPENDIX A ACTION AND LIMIT LEVELS

APPENDIX A – Action and Limit Levels

1-Hour TSP

Location	Action Level, μg/m ³	Limit Level, µg/m ³
CAM1	315	
CAM2	336	500
CAM3	344	

24-Hour TSP

Location	Action Level, µg/m ³	Limit Level, µg/m ³
CAM1	171	
CAM2	177	260
CAM3	192	

Construction Noise

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

<u>Landfill Gas</u>

Parameter	Limit Level	Action
	<19%	Ventilate to restore oxygen to >19%
Oxygen	<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%
	>0.5%	Ventilate to restore carbon dioxide to <0.5%
Carbon Dioxide	>1.5%	Stop works Evacuate personnel / prohibit entry Increase ventilation to restore carbon dioxide to <0.5%

APPENDIX B COPIES OF CALIBRATION CERTIFCATES

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



File No. <u>MA0010/37/0054</u>

Station	CAM1 - Government Staff Quarter	Operator:	WK
Date:	19-Dec-13	Next Due Date:	18-Feb-14
Equipment No.:	A-01-37	Serial No.	1704
Equipment No.:	A-01-37	Serial No.	1704

1995년 14 16 17 16 16 16 16 16 16 16 16 16 16 16 16 16		Ambient Condition		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Temperature, Ta (K)	288	Pressure, Pa (mmHg)	767.5	

	Or	ifice Transfer St	andard Informat	lion	
Equipment No.:	A-04-05	Slope, mc	0.0592	Intercept, bc	-0.0283
Last Calibration Date:	26-Dec-12		me x Qstd + be	= [ΔH x (Pa/760) x (298/T	a)] ^{1/2}
Next Calibration Date:	25-Dec-13		Qstd = $\{[\Delta H x]\}$	(Pa/760) x (298/Ta)] ^{1/2} -bc)	/ mc

		Calibration o	f TSP Sampler		
Calibration		Orfice			HVS
Point	∆H (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y axis
1	12.2	3.57	60.79	7.8	2.85
2	9.7	3.18	54.26	6.5	2.61
3	7.5	2.80	47.77	5.0	2.29
4	5.3	2.35	40.23	3.3	1.86
5	3,2	1.83	31.37	2.0	1.45
		Set Point (Calculation		
From the TSP F	ield Calibration C	urve, take Qstd = 43 CFM			
		e "Y" value according to			
rom me regree					
		$mw x Qstd + bw = [\Delta W$	x (Pa/760) x (2	298/Ta)] ^{1/2}	
Therefore, S	iet Point; W = (m	$(x + bw)^2 x (760 / Pa) x ($	Ta / 298) =	3.90	

Remarks:					
Conducted by:	ivk. Tang	Signature:	Kwai /	Date:	19/17/13
Checked by:	(Jz	Signature:		Date:	19 December 2013

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



-

File No. MA0010/A40/0054

Station	CAM2 - Hung H	ling Printing Cent	re	Operator:	WK	
Date:	19-Dec-13		-	Next Due Date:	18-Feb	-14
Equipment No.:	A-01-40			Serial No.	10239	· · · · · · · · · · · · · · · · · · ·
			Ambient	Condition		
Temperatu	ire, Ta (K)	288	Pressure, Pa			767.5
				<u> </u>	*	
Ne de Secto		Ori	fice Transfer St	andard Inform	ation	
Equipm			Slope, mc	0.0592	Intercep	
Last Calibr	ation Date:	26-Dec-12			oc = [∆H x (Pa/76	
Next Calibi	ation Date:	25-Dec-13		Qstd = $\{ \Delta H $	x (Pa/760) x (298	/Ta)] ^{1/2} -be} / mc
		•				
			Calibration of	f TSP Sampler		
Calibration		Orfi	ce	1		HVS
Point	ΔH (orifice),in. of water	[ΔH x (Pa/760) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/760) x (298/Ta)] ^{1/2} Y- axis
1	11.3	3.	44	58.52	7.4	2.78
2	9.7	3.	18	54.26	6.2	2.55
3	7.5	2.	80	47.77	4.9	2.26
4	5.3	2.	35	40.23	3.3	1.86
5	3.3	1.	86	31.85	2.0	1.45
By Linear Reg Slope , mw =	ression of Y on X 0.0498	<u>.</u>		Intercept, bw	-0.140)8
Correlation of	coefficient* =	0.99	96	_		
	-	0, check and recal	ibrate.	_		
an inan ing mananan ing manana ing man						a an
				Calculation		
		Curve, take Qstd =				
From the Regre	ssion Equation, th	e "Y" value accord	ling to			
		mw v O	std + bw = [∆W	x (Pa/760) x (7	298/Ta)1 ^{1/2}	
				x (1 // // // x (2	.>0/14/]	
Therefore, S	et Point; W = (m	$(w \ge 0.01 \text{ w} \le 0.01 \text{ w})^2$	x (760 / Pa) x (Ta / 298) =	3.84	
Remarks:						
)	191-2010	
	1. 7		k	.		D. 101.12
Conducted by: Checked by	Whitang 17	Signature:	<u> </u>	init	-	Date: $(9)_{12}(3)$ Date: $(9)_{22}(3)_{23}(3)$

19 December 2013

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



File No. MA0010/35/0054

							MA0010/35/0054
Station	CAM3 - Talcon	Industrial Ltd		Operator:			
Date:	19-Dec-13				18-Feb		
Equipment No.:	<u>A-01-35</u>			Serial No.	0810		
n ann an Chris			Ambient	Condition			
Temperatu	ire, Ta (K)	288	Pressure, Pa	ı (mmHg)	•	767.5	
					· · · · · · · · · · · · · · · · · · ·		
		Oı	rifice Transfer St	1	[
Equipm	ent No.:	A-04-05	Slope, me	0.0592	Intercep		-0.0283
Last Calibr	ation Date:	26-Dec-12			oc = [ΔH x (Pa/76		
Next Calibr	ation Date:	25-Dec-13		Qstd ⊨ {[∆H :	x (Pa/760) x (298	$/Ta)]^{1/2} -bc}$	/ mc
		•					
			Calibration of	TSP Sampler			
Calibration		Or	fice	Qstd (CFM)		HVS	1/2
Point	∆H (orifice), in. of water	[ΔH x (Pa/76	[ΔH x (Pa/760) x (298/Ta)] ^{1/2}		ΔW (HVS), in. of oil		760) x (298/Ta)] ^{1/2} Y- axis
1	12.4	1	3.60	61.28	7.9		2.87
2	9.7	3.18		54.26	6.0		2.50
3	8.6	3.00		51.12	5.2		2.33
4	5.4	2.38		40.60	3.3		1.86
5	3.1	1	1.80	30.88	1.9		1.41
By Linear Reg	ression of Y on X						
Slope , mw =	0.0477	-		Intercept, bw •	-0.078	35	
Correlation of	coefficient* =	0.9	993	-			
*If Correlation (Coefficient < 0.99	0, check and reca	alibrate.				
			Set Point (Calculation			
From the TSP F	ield Calibration C	Curve, take Qstd =	= 43 CFM				
From the Regres	ssion Equation, th	e "Y" value acco	rding to				
_	-				10		
		mw x ($Qstd + bw = [\Delta W]$	x (Pa/760) x (2	98/Ta)]***		
Therefore, S	et Point; W = (m	w x Qstd + bw) ²	² x (760 / Pa) x (Ta / 298) =	3.73	; 	
Domorka							
Remarks:							

Checked by: Checked by: Ch	Conducted by: <u>Jark 7ang</u> Checked by: <u>(+-</u>)		hwai	Date: Date:	19/12/13 19 December 2013
--	--	--	------	----------------	------------------------------



TISCH ENVIROMENTAL, INC. 145 SOUTH MIAMI AVE. VILLAGE OF CLEVES, OH 45002 513.467.9000 877.263.7610 TOLL FREE 513.467.9009 FAX WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - De	ec 26, 201	2 Rootsmeter		438320	Ta (K) -	295
Operator	Tisch	Orifice I.I		2323	Pa (mm) -	- 753.11
PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4440	3.2	2.00
2	NA	NA	1.00	1.0240	6.4	4.00
3	NA	NA	1.00	0.9120	8.0	5.00
4	NA	NA	1.00	0.8720	8.8	5.50
5	NA	NA	1.00	0.7200	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9967 0.9925 0.9903 0.9893 0.9840	0.6902 0.9693 1.0858 1.1345 1.3666	1.4149 2.0010 2.2372 2.3464 2.8299	0.9957 0.9915 0.9893 0.9883 0.9883 0.9830	0.6896 0.9683 1.0847 1.1334 1.3652	0.8851 1.2517 1.3995 1.4678 1.7702
Qstd slo intercep coeffici y axis =	t (b) = ent (r) =	2.09107 -0.02838 0.99996 Pa/760) (298/Ta)	Qa slope intercept coefficie] y axis =	; (b) =	1.30939 -0.01775 0.99996 Fa/Pa)]

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta) Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa] Qa = Va/Time

For subsequent flow rate calculations:

Qstd = $1/m\{ [SQRT(H2O(Pa/760)(298/Ta)) \} - b \}$ Qa = $1/m\{ [SQRT(H2O(Ta/Pa)] - b \}$



WELLAB LIMITED Rms 816, 1516 & 1701, Technology Park, 18 On Lai Street, Shatin, N.T, Hong Kong. Tel: 2898 7388 Fax: 2898 7076 Website: www.wellab.com.hk

TEST REPORT

APPLICANT: Cinotech Consultants Limited Room 1710, Technology Park, 18 On Lai Street, Shatin, NT, Hong Kong

Test Report No.:	CA/13/130430
Date of Issue:	2013-05-01
Date Received:	2013-04-30
Date Tested:	2013-04-30
Date Completed:	2013-05-01
Next Due Date:	2014-04-30
Page:	1 of 1

ATTN:

Mr. W.K Tang

Certificate of Calibration

Item for calibration:

Description	: RS232 Integral Vane Digital Anemometer
Manufacturer	: AZ Instrument
Model No.	: AZ8904
Serial No.	: 974835
Equipment No.	: A-03-03

Test conditions:

Room Temperature: 21 dRelative Humidity: 66%Pressure: 101.

: 21 degree Celsius : 66% : 101.1 kPa

Methodology:

The anemometer has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

	Reference Set Point	Instrument Readings
Measuring Air Velocity, m/s	2.00	2.00
Temperature, °C	21.0	21.0

PREPARED AND CHECKED BY: For and On Behalf of WELLAB Ltd.

PATRICK TSE Laboratory Manager

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TEST REPORT APPLICANT: Cinotech Consultants Limited Room 1710, Technology Park, 18 On Lai Street, Shatin, NT, Hong Kong Test Report No Date of Issue: Date Received: Date Tested: Date Completed Next Due Date

Test Report No.:	C/N/130104
Date of Issue:	2013-01-05
Date Received:	2013-01-04
Date Tested:	2013-01-04
Date Completed:	2013-01-05
Next Due Date:	2014-01-04
Page:	1 of 1

ATTN:

Mr. W. K. Tang

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 14303
Microphone No.	: 35222
Equipment No.	: N-08-05
IS:	

Test conditions:

Room Temperatre Relative Humidity : 22 degree Celsius : 59%

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

Remark: 1)This report supersedes the one dated 2012/01/21 with certificate number C/N/120120/1.

PREPARED AND CHECKED BY: For and On Behalf of WELLAB Ltd.

PATRICK TSE Laboratory Manager

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TEST REPORT

APPLICANT: Cinotech Consultants Limited Room 1710, Technology Park, 18 On Lai Street, Shatin, NT, Hong Kong

Test Report No .:	C/N/140104
Date of Issue:	2014-01-05
Date Received:	2014-01-04
Date Tested:	2014-01-04
Date Completed:	2014-01-05
Next Due Date:	2015-01-04
Page:	1 of 1

ATTN:

Mr. W. K. Tang

Relative Humidity

Certificate of Calibration

Item for calibration:

	Description	: 'SVANTEK' Integrating Sound Level Meter
	Manufacturer	: SVANTEK
	Model No.	: SVAN 955
	Serial No.	: 14303
	Microphone No.	: 35222
	Equipment No.	: N-08-05
Test conditio	ns:	
	Room Temperatre	: 19 degree Celsius

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

: 52%

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

Remark: 1)This report supersedes the one dated 2012/01/21 with certificate number C/N/120120/1.

PREPARED AND CHECKED BY: For and On Behalf of WELLAB Ltd.

PATRICK TSE Laboratory Manager



WELLAB LIMITED Rrns 816, 1516 & 1701, Technology Park, 18 On Lai Street, Shatin, N.T, Hong Kong. Tel: 2898 7388 Fax: 2898 7076 Website: www.wellab.com.hk

APPLICANT:	Cinotech Consultant	s Limited	Test Report No .:	C/N/131004/1		
	Room 1710, Technol	ogy Park,	Date of Issue:	2013-10-05		
	18 On Lai Street,		Date Received:	2013-10-04		
	Shatin, NT, Hong Ko	ng	Date Tested:	2013-10-04		
		C	Date Completed:	2013-10-05		
			Next Due Date:	2014-10-04		
ATTN:	Mr. W.K. Tang		Page:	1 of 1		
Item for calibi	ation:					
		_	1 0 111			
	Description	: Acoustica	al Calibrator			
	Description Manufacturer	: Acoustica : SVANTE				
	-	••••••				
	Manufacturer	: SVANTE				

Room Temperatre Relative Humidity : 21 degree Celsius : 57%

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY: For and On Behalf of WELLAB Ltd.

PATRICK TSE Laboratory Manager

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APPENDIX C ENVIRONMENTAL MONITORING SCHEDULE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Jan	2-Jan	3-Jan	4-Jan
					1 hr TSP	
						24 hr TSP
5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan	11-Jan
	1 hr TSP Noise	1 hr TSP			1 hr TSP	
	TOISE				24 hr TSP	
12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan	18-Jan
	1 hr TSP Noise		1 hr TSP		1 hr TSP	
				24 hr TSP		
19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan
		1 hr TSP Noise		1 hr TSP	1 hr TSP	
			24 hr TSP			
26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan	
	1 hr TSP		1 hr TSP Noise	1 hr TSP		
	24 hr TSP			24 hr TSP		

Contract No. DC/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B Impact Air Quality and Noise Monitoring Schedule for January 2014

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Contract No. DC/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B Tentative Impact Air Quality and Noise Monitoring Schedule for February 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Feb
2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb
			1 hr TSP	1 hr TSP	1 hr TSP	
			24 hr TSP	Noise		
			24 nr 15P			
9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb
	1 hr TSP		1 hr TSP		1 hr TSP	
	Noise	24 hr TSP				
		24 11 1 51				
16-Feb	17-Feb	18-Feb	19-Feb	20-Feb	21-Feb	22-Feb
		1 hr TSP	1 hr TSP		1 hr TSP	
	24 hr TSP	Noise				24 hr TSP
	24 11 1 31					24 11 1 51
23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	
		1 hr TSP	1 hr TSP	1 hr TSP		
		Noise				
					24 hr TSP	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

APPENDIX D 1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix D - 1-hour TSP Monitoring Results

Station CAM1 Government Staff Quarters

Date	Sampling	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elaps	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Dale	Time	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
3-Jan-14	09:00	Sunny	291.3	765.5	3.6711	3.6825	0.0114	22307.1	22308.1	1.0	1.21	1.21	1.21	72.6	157
6-Jan-14	09:00	Sunny	288.4	767.5	3.7030	3.7089	0.0059	22332.1	22333.1	1.0	1.22	1.22	1.22	73.0	81
7-Jan-14	13:00	Sunny	291.7	764.4	3.6907	3.6971	0.0064	22333.1	22334.1	1.0	1.21	1.21	1.21	72.5	88
10-Jan-14	09:00	Cloudy	287.3	772.8	3.6900	3.6951	0.0051	22334.1	22335.1	1.0	1.22	1.22	1.22	73.4	70
13-Jan-14	09:00	Sunny	284.3	772.5	3.7596	3.7640	0.0044	22359.1	22360.1	1.0	1.23	1.23	1.23	73.7	60
15-Jan-14	09:00	Sunny	284.9	773.0	3.5684	3.5752	0.0068	22360.1	22361.1	1.0	1.23	1.23	1.23	73.7	92
17-Jan-14	15:00	Sunny	292.3	767.6	3.8820	3.8919	0.0099	22385.1	22386.1	1.0	1.21	1.21	1.21	72.5	136
21-Jan-14	09:00	Sunny	285.4	772.1	3.7281	3.7348	0.0067	22386.1	22387.1	1.0	1.23	1.23	1.23	73.6	91
23-Jan-14	13:45	Sunny	287.9	769.5	3.8693	3.8724	0.0031	22411.1	22412.1	1.0	1.22	1.22	1.22	73.1	42
24-Jan-14	13:00	Sunny	290.7	765.7	3.5159	3.5196	0.0037	22412.1	22413.1	1.0	1.21	1.21	1.21	72.6	51
27-Jan-14	09:00	Sunny	288.3	769.9	3.8828	3.8966	0.0138	22413.1	22414.1	1.0	1.22	1.22	1.22	73.1	189
29-Jan-14	11:00	Sunny	288.4	768.4	3.8686	3.8789	0.0103	22438.1	22439.1	1.0	1.22	1.22	1.22	73.0	141
30-Jan-14	09:00	Sunny	290.1	768.8	3.8790	3.8922	0.0132	22439.1	22440.1	1.0	1.21	1.21	1.21	72.8	181
														Min	42
														Marri	400

Max 189 Average 106

Station CAM2

Heng Hing Printing Centre

Date	Sampling	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elapse	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Dale	Time	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
3-Jan-14	15:40	Sunny	296.2	762.2	3.7449	3.7547	0.0098	29482.3	29483.3	1.0	1.19	1.19	1.19	71.6	137
6-Jan-14	09:00	Sunny	288.4	767.5	3.6810	3.6872	0.0062	29507.3	29508.3	1.0	1.21	1.21	1.21	72.7	85
7-Jan-14	13:00	Sunny	291.7	764.4	3.7036	3.7078	0.0042	29508.3	29509.3	1.0	1.20	1.20	1.20	72.2	58
10-Jan-14	14:30	Cloudy	288.6	769.8	3.8977	3.9028	0.0051	29509.3	29510.3	1.0	1.21	1.21	1.21	72.8	70
13-Jan-14	15:00	Sunny	287.1	769.4	3.6989	3.7042	0.0053	29534.3	29535.3	1.0	1.22	1.22	1.22	72.9	73
15-Jan-14	09:00	Sunny	284.9	773.0	3.6755	3.6843	0.0088	29535.3	29536.3	1.0	1.22	1.22	1.22	73.4	120
17-Jan-14	15:00	Sunny	292.3	767.6	3.8703	3.8798	0.0095	29560.3	29561.3	1.0	1.20	1.20	1.20	72.2	131
21-Jan-14	09:00	Sunny	285.4	772.1	3.7322	3.7393	0.0071	29561.3	29562.3	1.0	1.22	1.22	1.22	73.3	97
23-Jan-14	14:00	Sunny	287.9	769.5	3.6320	3.6378	0.0058	29586.3	29587.3	1.0	1.21	1.21	1.21	72.8	80
24-Jan-14	13:00	Sunny	290.7	765.7	3.5926	3.5991	0.0065	29587.3	29588.3	1.0	1.21	1.21	1.21	72.3	90
27-Jan-14	09:00	Sunny	288.2	769.9	3.8803	3.8909	0.0106	29588.3	29589.3	1.0	1.21	1.21	1.21	72.8	146
29-Jan-14	16:00	Sunny	294.4	766.1	3.9025	3.9129	0.0104	29613.3	29614.3	1.0	1.20	1.20	1.20	71.9	145
30-Jan-14	09:00	Sunny	290.1	768.8	3.8578	3.8664	0.0086	29614.3	29615.3	1.0	1.21	1.21	1.21	72.6	119
														Min	58
														Max	146

104

Average

Appendix D - 1-hour TSP Monitoring Results

Station CAM3

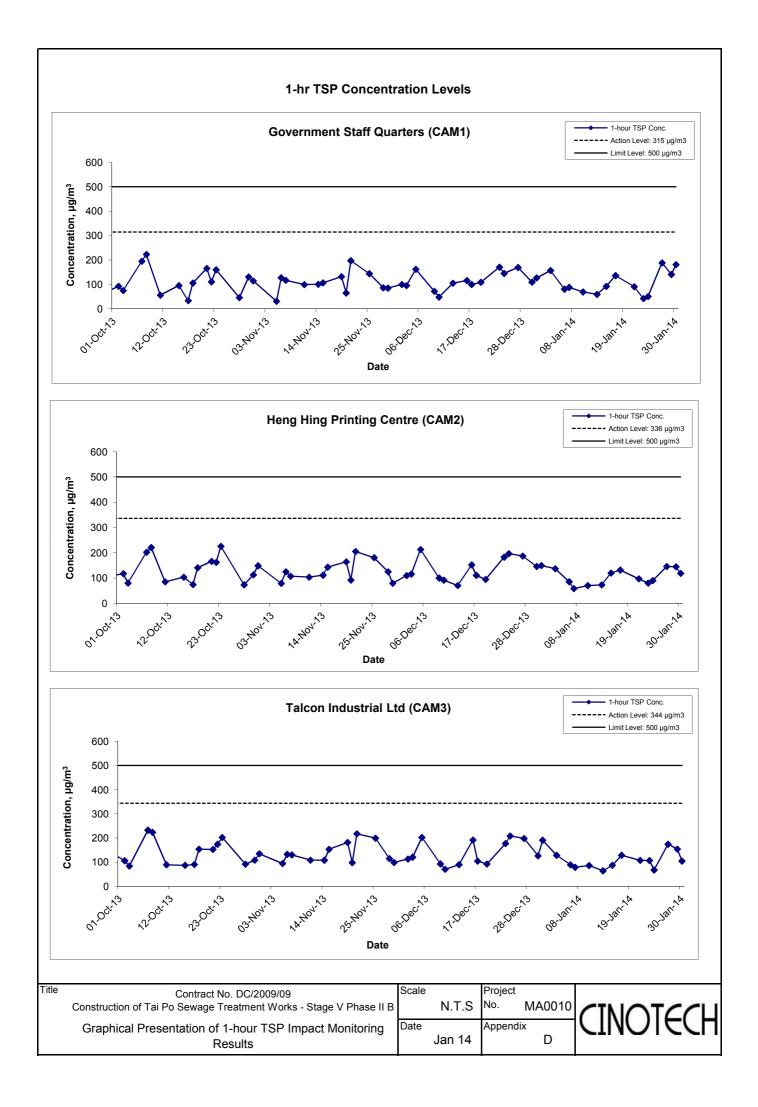
Talcon Industrial Ltd

Date	Sampling	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elapse	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Dale	Time	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
3-Jan-14	15:45	Sunny	296.2	762.2	3.7208	3.7300	0.0092	22716.9	22717.9	1.0	1.19	1.19	1.19	71.6	129
6-Jan-14	09:00	Sunny	288.4	767.5	3.6863	3.6928	0.0065	22741.9	22742.9	1.0	1.21	1.21	1.21	72.7	89
7-Jan-14	13:00	Sunny	291.7	764.4	3.6870	3.6927	0.0057	22742.9	22743.9	1.0	1.20	1.20	1.20	72.2	79
10-Jan-14	14:30	Cloudy	287.3	772.8	3.8941	3.9004	0.0063	22743.9	22744.9	1.0	1.22	1.22	1.22	73.1	86
13-Jan-14	15:00	Sunny	287.1	769.4	3.5780	3.5827	0.0047	22768.9	22769.9	1.0	1.22	1.22	1.22	73.0	64
15-Jan-14	09:00	Sunny	284.9	773.0	3.7105	3.7169	0.0064	22769.9	22770.9	1.0	1.22	1.22	1.22	73.4	87
17-Jan-14	15:00	Sunny	292.3	767.6	3.8775	3.8868	0.0093	22794.9	22795.9	1.0	1.20	1.20	1.20	72.3	129
21-Jan-14	09:00	Sunny	285.4	772.1	3.7430	3.7509	0.0079	22795.9	22796.9	1.0	1.22	1.22	1.22	73.3	108
23-Jan-14	14:00	Sunny	287.9	769.5	3.6386	3.6464	0.0078	22820.9	22821.9	1.0	1.22	1.21	1.21	72.9	107
24-Jan-14	13:00	Sunny	290.7	765.7	3.8681	3.8730	0.0049	22821.9	22822.9	1.0	1.21	1.21	1.21	72.4	68
27-Jan-14	09:00	Sunny	288.3	769.9	3.8708	3.8835	0.0127	22822.9	22823.9	1.0	1.21	1.21	1.21	72.9	174
29-Jan-14	16:00	Sunny	294.4	766.1	3.9034	3.9145	0.0111	22847.9	22848.9	1.0	1.20	1.20	1.20	72.0	154
30-Jan-14	09:00	Sunny	290.1	768.8	3.8226	3.8302	0.0076	22848.9	22849.9	1.0	1.21	1.21	1.21	72.6	105
														Min	64

 Min
 64

 Max
 174

 Average
 106



APPENDIX E 24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix E - 24-hour TSP Monitoring Results

Station CAM1 Government Staff Quarters

Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elaps	e Time	Sampling	Flow Rate (m ³ /min.)		Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m³)
4-Jan-14	Sunny	290.1	767.5	3.6891	3.8796	0.1905	22308.1	22332.1	24.0	1.21	1.21	1.21	1746.9	109
10-Jan-14	Cloudy	287.8	772.4	3.7251	3.8895	0.1644	22335.1	22359.1	24.0	1.22	1.22	1.22	1759.0	93
16-Jan-14	Sunny	285.4	772.4	3.7075	3.8603	0.1528	22361.1	22385.1	24.0	1.23	1.23	1.23	1766.0	87
22-Jan-14	Sunny	283.9	772.9	3.6076	3.7616	0.1540	22387.1	22411.1	24.0	1.23	1.23	1.23	1771.0	87
27-Jan-14	Sunny	291.1	767.6	3.7770	3.9505	0.1735	22414.1	22438.1	24.0	1.21	1.21	1.21	1744.3	99
30-Jan-14	Sunny	290.6	768.4	3.8625	3.9764	0.1139	22440.1	22464.1	24.0	1.21	1.21	1.21	1746.5	65
													Min	65
													Max	109
													Average	90

Station CAM2

Heng Hing Printing Centre

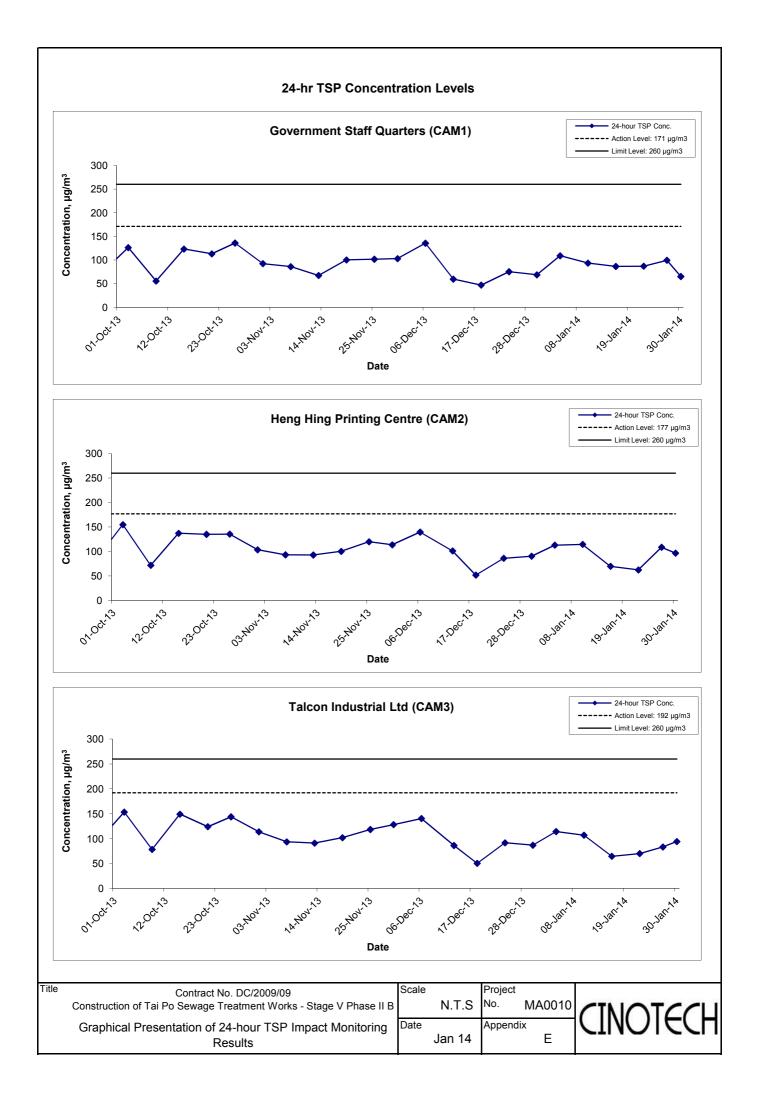
Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elaps	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
4-Jan-14	Sunny	290.1	767.5	3.6846	3.8810	0.1964	29483.3	29507.3	24.0	1.21	1.21	1.21	1739.9	113
10-Jan-14	Cloudy	287.4	772.2	3.8827	4.0834	0.2007	29510.3	29534.3	24.0	1.22	1.22	1.22	1752.7	115
16-Jan-14	Sunny	285.4	772.4	3.8847	4.0072	0.1225	29536.3	29560.3	24.0	1.22	1.22	1.22	1758.4	70
22-Jan-14	Sunny	283.9	772.9	3.8644	3.9742	0.1098	29562.3	29586.3	24.0	1.22	1.22	1.22	1763.3	62
27-Jan-14	Sunny	291.1	767.6	3.9050	4.0938	0.1888	29589.3	29613.3	24.0	1.21	1.21	1.21	1737.4	109
30-Jan-14	Sunny	295.0	766.3	3.8646	4.0314	0.1668	29615.3	29639.3	24.0	1.20	1.20	1.20	1725.1	97
-				-		-				-		-	Min	62
													Max	115
													Average	94

Station CAM3

Talcon Industrial Ltd

Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elapse	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
4-Jan-14	Sunny	290.1	766.0	3.6749	3.8736	0.1987	22717.9	22741.9	24.0	1.21	1.21	1.21	1739.2	114
10-Jan-14	Cloudy	287.4	772.2	3.8852	4.0727	0.1875	22744.9	22768.9	24.0	1.22	1.22	1.22	1754.0	107
16-Jan-14	Sunny	285.4	772.4	3.8885	4.0020	0.1135	22770.9	22794.9	24.0	1.22	1.22	1.22	1759.9	64
22-Jan-14	Sunny	283.9	772.9	3.8735	3.9969	0.1234	22796.9	22820.9	24.0	1.23	1.23	1.23	1764.9	70
27-Jan-14	Sunny	291.1	767.6	3.9050	4.0498	0.1448	22823.9	22847.9	24.0	1.21	1.21	1.21	1738.2	83
30-Jan-14	Sunny	295.0	766.3	3.8481	4.0107	0.1626	22849.9	22873.9	24.0	1.20	1.20	1.20	1725.6	94
													Min	64
													Max	114

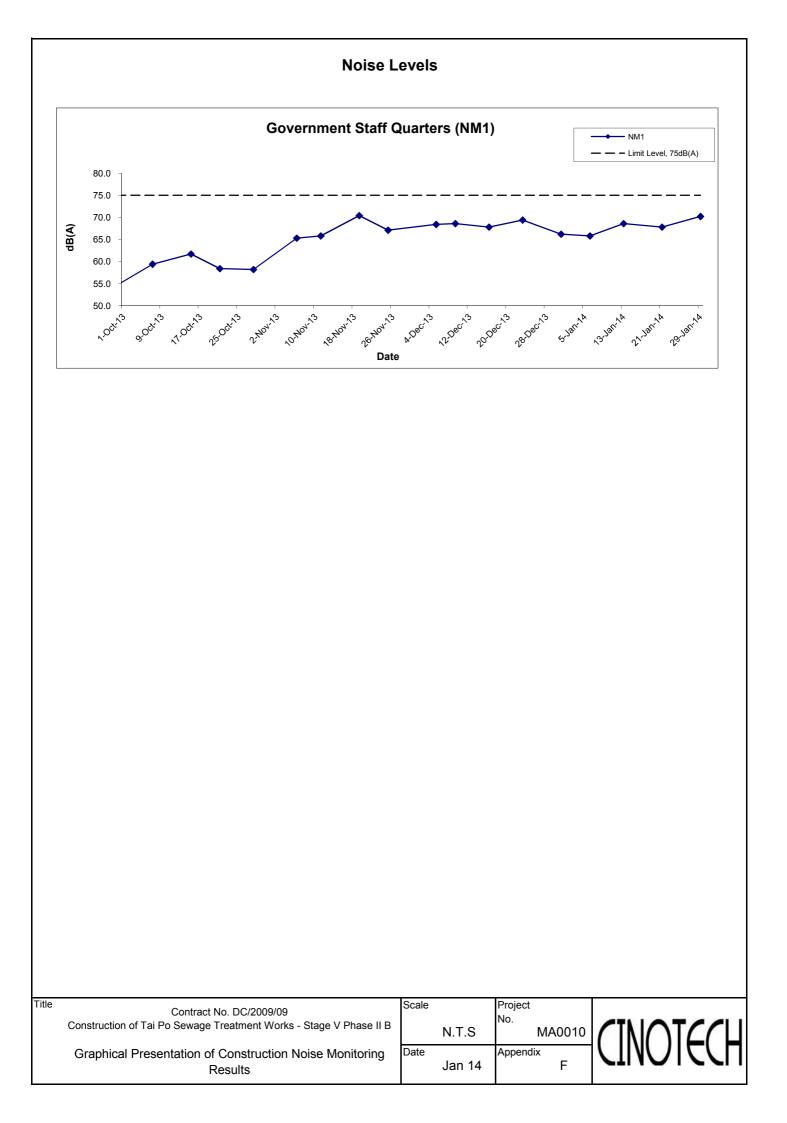
Average 89



APPENDIX F NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - Noise Monitoring Results

Location NM1 - Government Staff Quarters						
Dete	Time	\A/a atla an	dE	8 (A) (30-min))	
Date	Time	Weather	L _{eq}	L ₁₀	L ₉₀	
6-Jan-14	09:15	Sunny	65.8	67.2	63.0	
13-Jan-14	11:15	Sunny	68.6	69.7	65.3	
21-Jan-14	10:45	Sunny	67.8	69.0	65.7	
29-Jan-14	11:00	Sunny	70.2	72.5	60.9	
		Average	68.4	69.6	63.7	
		Minimum	65.8	67.2	60.9	
		Maximum	70.2	72.5	65.7	



APPENDIX G SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

Reporting Month: January 2014

- 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 H SITE AUDIT SUMMARY

Checklist Reference Number	140103	
Date	3 January 2014 (Friday)	
Time	10:00-11:00	

Ref. No.	Non-Compliance	Related Item
		No.
	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	 Part B - Water Quality No environmental deficiency was identified during the site inspection. Part C - Air Quality No environmental deficiency was identified during the site inspection. Part D - Noise 	
140103-R01	 No environmental deficiency was identified during the site inspection. Part E - Waste / Chemical Management Construction waste near Methane Gas Holder no.2 should be cleared. Part F - Permit / Licenses No environmental deficiency was identified during the site inspection. 	E4ii
	 Part G – Reminder No environmental deficiency was identified during the site inspection. Others Follow-up on previous audit section (Ref. No.:131227), all environmental deficiencies were observed to be improved/rectified by the Contractor. 	

	Name	Signature	Date
Recorded by	Edmond Put	the	6 January 2014
Checked by	Dr. Priscilla Choy	WZ	6 January 2014

Checklist Reference Number	140107	
Date	7 January 2014 (Tuesday)	1,110,120,100,000
Time	09:30-10:30	

Ref. No.	Non-Compliance	Related Item
		No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Iten No.
	Part B - Water Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part C - Air Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part D Noise	
	• No environmental deficiency was identified during the site inspection.	
	 <i>Part E – Waste / Chemical Management</i> No environmental deficiency was identified during the site inspection. 	
	Part F - Permit / Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part G – Reminder	
	• No environmental deficiency was identified during the site inspection.	
	Others	
	Follow-up on previous audit section (Ref. No.:140103), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put		10 January 2014
Checked by	Dr. Priscilla Choy	N.L	10 January 2014

Checklist Reference Number	140117
Date	17 January 2014 (Friday)
Time	10:00-11:00

Ref. No.	Non-Compliance	Related Item
		No.
~	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	Part B - Water Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part C - Air Quality	
140117-R02	• Dusty stockpile should be removed.	C7
	Part D – Noise	
	• No environmental deficiency was identified during the site inspection.	
	Part E – Waste / Chemical Management	
140117-R01	• Construction waste should be sorted and cleared.	E4ii
	Part F - Permit / Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part G – Reminder	
	• No environmental deficiency was identified during the site inspection.	
1	Others	
	Follow-up on previous audit section (Ref. No.:140107), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	CC->	20 January 2014
Checked by	Dr. Priscilla Choy	WZ	20 January 2014

Checklist Reference Number	140124	
Date	24 January 2014 (Friday)	
Time	10:00-11:00	

Ref. No.	Non-Compliance	Related Item
		No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Iten No.
	Part B - Water Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part C - Air Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part D – Noise	
	• No environmental deficiency was identified during the site inspection.	
	 Part E – Waste / Chemical Management No environmental deficiency was identified during the site inspection. 	
	• No environmental deficiency was identified during the site inspection.	
	Part F - Permit / Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part G – Reminder	
	• No environmental deficiency was identified during the site inspection.	
	Others	
	Follow-up on previous audit section (Ref. No.:140117), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put		24 January 2014
Checked by	Dr. Priscilla Choy	WI	24 January 2014

Checklist Reference Number	140129	
Date	29 January 2014 (Wednesday)	
Time	10:30-11:30	

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	Part B - Water Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part C - Air Quality	
	• No environmental deficiency was identified during the site inspection.	
	Part D – Noise	
	• No environmental deficiency was identified during the site inspection.	
	Part E – Waste / Chemical Management	
140129-R01	Construction waste should be sorted and cleared.	E4ii
140129-R02	• Drip tray should be provided to the chemical containers.	E7ii
140129-R03	• Chemical container not in use should be properly stored or removed.	E2i
	Part F - Permit / Licenses	
	• No environmental deficiency was identified during the site inspection.	
	Part G Reminder	
	• No environmental deficiency was identified during the site inspection.	
	Others	
	Follow-up on previous audit section (Ref. No.:140124), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	den-	30 January 2014
Checked by	Dr. Priscilla Choy	WIL	30 January 2014

APPENDIX I EVENT ACTION PLANS

APPENDIX I (1) – Event Action Plan for Air Quality Monitoring (Construction Phase)

EVENT		ACTIO	N	
EVENI	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	 Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC and ER; Repeat measurement to confirm finding; Increase monitoring frequency to daily. 	 Check monitoring data submitted by ET; Check Contractor's working method. 	1. Notify Contractor.	 Rectify any unacceptable practice; Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	 Identify source; Inform IC(E) and ER; Advise the ER on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and ER; If exceedance stops, cease additional monitoring. 	 Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	 Confirm receipt of notification of exceedance in writing; Ensure remedial measures properly implemented. 	 Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
LIMIT LEVEL				
1. Exceedance for one sample	 Identify source, investigate the causes of exceedance and propose remedial measures; Inform Contractor, IEC, ER, and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	 Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	 Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	 Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	 Notify IEC, ER, Contractor and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and ER to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	 Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	 Confirm receipt of notification of exceedance in writing; Notify Contractor; In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	 Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX I (2) – Event Action Plan for Construction Noise Monitoring (Construction Phase)

EVENT		ACT	TION	
EVENI	ET	IEC	ER	CONTRACTOR
ACTION LEVEL	 Notify IEC and Contractor; Carry out investigation; Report the results of investigation to the IEC, ER and Contractor; Discuss with the Contractor and formulate remedial measures; Increase monitoring frequency to check mitigation effectiveness. 	 Review the analyzed results submitted by the ET; Review the propose d remedial measures by the Contractor and advise the ER accordingly; Supervise the implementation of remedial measures. 	 Confirm receipt of notification of failure in writing; Notify Contractor; Require Contractor to propose remedial measures for the analyzed noise problem; Ensure remedial measures are properly implemented. 	 Submit noise mitigation proposals to IEC; Implement noise mitigation proposals.
LIMIT LEVEL	 Identify source; Inform IEC, ER, EPD and Contractor; Repeat measurements to confirm findings; Increase monitoring frequency; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Inform IEC, ER and EPD the causes and actions taken for the exceedances; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	 Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	 Confirm receipt of notification of failure in writing; Notify Contractor; Require Contractor to propose remedial measures for the analysed noise problem; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	 Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within 3 working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the ER until the exceedance is abated.

APPENDIX I (3) – Event Action Plan for Landfill Gas Monitoring (Construction Phase)

Parameter	Limit Level	Action Required
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% LEL
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 J UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

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	\checkmark
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. 	V
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.	V
	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.	V
	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.	V
	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.	√

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

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.	\checkmark
	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.	1
	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.	1
	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.	V
	 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. 	1
	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.	V
	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.	\checkmark

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.	V
	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.	\checkmark
	 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 shall be included in the Safety Plan Monitoring shall be conducted at the cracks on the ground floor during ground-works construction 	1
	 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 	1

- Note: $\sqrt{-}$ Compliance of mitigation measures X Non-compliance of mitigation measures N/A Not applicable

APPENDIX K WASTE GENERATION IN THE REPORTING MONTH 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)

	Actual Quantities of Inert C&D Materials Generated Monthly							Actual Quantities of C&D Wastes Generated Monthly			
Month	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	0.57	0	0	0	0.57	0	0.6	0	0	0	0.01
Feb											
Mar											
Apr											
May											
June											
Sub-total	0.57	0	0	0	0.57	0	0.6	0	0	0	0.01
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total											

Waste Flow Table

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 L COMPLAINT LOG

APPENDIX L – COMPLAINT LOG

Reporting Month: January 2014

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

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

APPENDIX M CONSTRUCTION PROGRAMME

Act Description	Orig Early Dur Start	Early Tot Finish Flo		2010 2011 2012	2013
General				FMAMJJASONDJFMAMJJASONDJFMAMJJASON	ND JFMAMJJA
Project Key Date					
1000 Possession of Site	0	28JAN10	100	Possession of Site	
10000 Completion of Section I of Works (365+17d)	0	14FEB11	100	Completion of Section 1 of Works (365+17d)	
20000 Completion of Section II of Works (460+70.5d)	0	05MAR13	100		Completion of S
30000 Completion of Section III of Works (670+98d)	0	08JUN12	100	Completion of	f Section III of Works (670+9
40000 Completion of Section IV of Works (365+19d)	0	16FEB11	100	Completion of Section IV of Works (365+19d)	
50000 Completion of Section V of Works (1185+69d)	0	05JUL13	100		Com
60000 T&C for FC11B & FC12B by E&MP	60 15OCT12	10JAN13	100		T&C for FC11B & FC1
60010 Notice on Suspension of Aeration Tank No. 4	10 18FEB13	20FEB13	100		INotice on Suspen
60020 Notice on Suspension of Extg Chlorination House	10 10FEB14	19FEB14 -	21d 0		
60030 Notice on Suspension of Gas Holder Tank No. 2	10 10FEB14	19FEB14 -	21d 0		
60040 Takeover of Bio-gas Holding Tank Support Area	10 08MAR13	18MAR13	100		Takeover of Bio
60050 Notice on Suspension of Aeration Tank No. 1~3	10 01MAR14	10MAR14 -	40d 0		
60060 Takeover of Bio-gas Holding Tank Area	10 16OCT13	26OCT13	. 100		
60070 Puddle at Service Tower Building by E&MP (VO58)	10 29DEC13	07JAN14	72d 0		
Preliminary					
1010 Site Clearance	30 29JAN10	27FEB10	100	Site Clearance	
1020 Contractor Site Office Set-up	60 07APR10		100	Contractor Site Office Set-up	
1030 Engineer's Accommodation	60 28FEB10	02JUN10	100	Engineer's Accommodation	
1040 Initial Survey	60 29JAN10	29MAR10	100	Initial Survey	
1050 Condition Survey	60 19APR10	14JUN10	100	Condition Survey	
1060 Environmental Baseline Monitoring	14 09APR10	22APR10	100	Environmental Baseline Monitoring	
1070 Replacing Floor Tile for Engineer's Accomodation	30 03AUG10	07OCT10	100	Replacing Floor Tile for Engineer's Accomodation	
Submission for Approval					
2010 Engineer's Green Roof	60 10MAY10	17SEP10	.100	Engineer's Green Roof	
2020 Excavation and Lateral Support (ELS)	30 15MAY10	09JUL10	100	Excavation and Lateral Support (ELS)	
2030 Project Signboard (DELETED)	30 28DEC10	28DEC10	100	Project Signboard (DELETED)	
2040 Pile Load Test Set-up	30 03JUN10	20NOV10	100	Pile Load Test Set-up	
2050 Falsewk & Fwk for Pile Cap	30 03JUN10	19JUL10	100	Falsewk & Fwk for Pile Cap	
2060 Falsewk & Fwk for Wall Structure	30 18JUN10	19JUL10	100	Falsewk & Fwk for Wall Structure	
2070 Falsewk & Fwk for Top Slab	30 03JUL10	19JUL10	100	Falsewk & Fwk for Top Slab	
2080 Multi-part Cover	45 28JUN11	10APR12	100	► Basic Constant Cover Multi-part Cover	
2090 FRP Handrail, Stair & Floor	45 09JUN11		100	► Manager Handrail, Stair & Floor	
2100 FRP Cover	30 09JUN11	11JAN12	100	► Entropy Cover	
2120 Green Roof System at Sludge Dewatering House	60 28MAY10		100	► Extended and the second sec	
2130 Green Roof System at Transformer House	60 28MAY10		100	Le restruction at transformer	House
2140 Watertight Bulkhead Door at SDT3	28 26JUN13		37d 80		
2150 Revised walkway for SDT3 (VO124)	30 05DEC13	12JAN14	2d 50		
Material Purchasing					
3010 Casing for Mini-pile	55 15MAY10		100	Casing for Mini-pile	
3020 Casing for Replaced Socketted H-pile	55 15MAY10		100	Casing for Replaced Socketted H-pile	
3030 Steel Member for Socketted H-pile	55 28FEB10		100	Steel Member for Socketted H-pile	
3040 DI Water Pipe Puddle & Tee	180 28MAY10		100	DI Water Pipe Puddle & Tee	
3050 DI Water Pipeline	180 28MAY10		100	DI Water Pipeline	
3060 Steel Member for Shelter		23NOV10	100	Steel Member for Shelter	
3070 Fabrication of walkway for SDT3 (VO124)	20 13JAN14	01FEB14	2d 0		
Section I of Works					
Drilling Works					
10001 Section I of Work (Substantial Completion)	382 29JAN10		100	Pre-drilling Works (18 nos)	
10010 Pre-drilling Works (18 nos)	45 10MAR10		100	Pre-dnling Works (18 nos)	
10020 Preliminary Pile	7 21SEP10		100	Preliminary Pile	
10030 Load Test for Preliminary Pile	14 210CT10		100	Load Test for Preliminary Pile	
10040 Alternative Proposed Mini-piling (56 nos)	70 27JUL10		100	Alternative Proposed Mini-piling (56 nos)	
10050 Proof Drilling (4 nos)	14 01NOV10		100	Proof Drilling (4 nos)	
10060 Load Test for Main Pile (1 no)	14 26NOV10	07DEC10	100	Load Test for Main Pile (1 no)	
Start date 29JAN10 Early bar				· · ·	
Progress bar					23
Run date 06 IAN14				China Harbour Engineering Co. Ltd.	18
Page number 1A Summary bar				TPSTW Stage 5 Phase 2B	06
c Primavera Systems, Inc.					1
Finish milestone point					

SONDIE	2014 MAMJJAS (2) N D L E M A	015 M.J.J.A.
 Section II of Work	s (460+70.5d)		
98d)	· · · ·		
	•		
II I	n V of Works (1185+69	9d)	
12B by E&MP	ank No. 4		
EI 1	Notice on Suspension	of Extg Chlorinatio	on House
	Notice on Suspension	of Gas Holder Tar	nk No. 2
o-gas Holding Tar		n of Aprotion Tool	(No. 1-2
	Notice on Suspension f Bio-gas Holding Tan		(NO. 1~3
Pud	dle at Service Tower E	Building by E&MP (VO58)
			1
		4. 	
		• •	
	an a	an a	
Wat	ertight Bulkhead Door	at SDT3	
	vised walkway for SDT	3 (VO124)	
	abrication of walkway	for SDT3 (\/0124)	
	abrication of walkway	0. 0010 (VO124)	
Date	Revision	Checked	Approved
BAPR12	D	AA	TKC
BJAN13	E	AA	TKC
BAUG13 BJAN14	F G	AA AA	TKC TKC
		<u> </u>	

Act	Description	Orig Early	Early	Total	%	2010 2011 2012 2013
ID		Dur Start	Finish	Float	/o F	FMAMJJASONDJFMAMJJASONDJFMAMJJA
and a second sec	arifier No. FC11B & FC12B Excavation for FC11B	15 15DEC10	20 14111	i i	100	Excavation for FC11B
10120	Pile Head Construction for FC11B		11FEB11		100	Pile Head Construction for FC11B
10130	Base Slab of FC11B	20 11FEB11	02MAR11		100	Base Slab of FC11B
10140	Structural Wall for FC11B	30 03MAR11	15APR11		100	Structural Wall for FC11B
10150	Watertightness Test for FC11B	20 26APR11			100	Watertightness Test for FC11B
10160	Concrete Coating for FC11B	7 22AUG11	29AUG11		100	Concrete Coating for FC11B
10170	Backfilling for FC11B (Stage I)	20 20MAY11	15AUG11		100	Backfilling for FC11B (Stage I)
10180	Excavation for 12B	15 13JAN11	15MAR11		100	Excavation for 12B
10190	Pile Head Construction for FC12B	15 22FEB11	16MAR11	 	100	Pile Head Construction for FC12B
10200	Base Slab of FC12B	20 12MAR11	1	{	100	Base Slab of FC12B
10210	Structural Wall for FC12B	20 01APR11	25MAY11		100	Structural Wall for FC12B
10220	Watertightness Test for FC12B	20 03JUN11	15JUN11	l · · · · · · · · · · · · · · · · · · ·	100	Watertightness Test for FC12B
10230	Concrete Coating for FC12B		29AUG11		100	Concrete Coating for FC12B
222.5	Backfilling for FC12B (Stage 1) Pillar Box for FC11B & FC12B	20 20JUN11	15AUG11	<u> </u>	100	Backfilling for FC12B (Stage 1)
Pipeline		30 20JUL11	13AUG11		100	→ Billar Box for FC11B & FC12B
SC N 1	DN700 DI Pipe % FC11B & extg chamber	50 17SEP12	1700712		100	□
	DN700 DI Pipe % FC12B & extg chamber	50 17SEP12			100	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
189 - Co	Sludge Drawoff Chamber C2B~C3B & Pipework	30 13JUL10			100	Sludge Drawoff Chamber C2B~C3B & Pipework
	Sealing extg M/H E9 for sewer diversion		28FEB11	<u> </u>	100	Ill Sealing extg M/H E9 for sewer diversion
	Removal of extg DN900 conc. pipe	20 01MAR11			100	Removal of extg DN900 conc. pipe
11060	Removal of extg DN525 conc. pipe	20 29APR11			100	► Removal of extg DN525 conc. pipe
11070	Sludge Drawoff Chamber C1B & Pipework	35 06DEC13	07JAN14	82d	70	
11080	Cable Ducting at Sludge Dewatering House	150 12MAY12	01DEC12		100	Cable Ducting at Sludge I
. 82 8/	DN500 DI Pipe % FC11B & new Drawoff Chamber 4	30 10JAN12	05OCT12		100	DN500 DI Pipe % FC11B & ne
the second second second second	DN500 DI Pipe % FC12B & new Drawoff Chamber 4	30 10JAN12	05OCT12		100	DN500 DI Pipe % FC12B & net
Variation						
※ ※	Demolition of extg Drawoff Chamber 4 (VO13)		22DEC11	<u> </u>	100	Demolition of extg Drawoff Chamber 4 (VO13)
12020	Construction of new Drawoff Chamber 4 (VO13)	90 23DEC11			00	Construction of new Drawoff Chamber 4
	Rectification of Draw-off Chamber 4 Watertightness test for Drawoff Chamber 4 (VO13)	33 29APR13			100	
86 Paris	Backfilling for new Drawoff Chamber 4 (VO13)	14 25JUL13 30 11AUG13	10AUG13		00	
Section II o			1000113	<u> </u>		i a filia a contra de la contra contra contra contra contra contra contra de la contra de la contra de la contr En la contra contra de la contra contra contra contra de la contra contra de la contra de la contra de la contra
Drilling V						
	Notification from Engineer	90 22SEP11	22SEP11		00	► Notification from Engineer
20 C	Section II of Works	531 22SEP11	12AUG13		00	
20020	Removal of extg Final Settlement Tank No. 7	90 18SEP10	10JAN11		00	Removal of extg Final Settlement Tank No. 7
20030	Removal of extg Final Settlement Tank No. 10	90 14DEC10	28MAR11		00	Removal of extg Final Settlement Tank No. 10
	Pre-drilling Works for FC7B, 8B & 10B (27 nos)	45 12APR11	29JUN11		00	Pre-drilling Works for FC7B, 8B & 10B (27 nos)
200 X.	Removal of extg Final Settlement Tank No. 8		27JUN11		00	Removal of extg Final Settlement Tank No. 8
SS 22	Clearing extg Final Settlement Tank No. 9		03NOV11		00	Clearing extg Final Settlement Tank No. 9
	Removal of extg Final Settlement Tank No. 9		05JAN12		00	Removal of extg Final Settlement Tank No. 9
1921 631	Pre-drilling Works for FC9B (9 nos)		20MAR12		00	Pre-drilling Works for FC9B (9 nos)
20 C	Alternative Proposed Mini-piles for FC8B & FC10B		04NOV11		00	Alternative Proposed Mini-piles for FC8B & FC10B
1923 W	Alternative Proposed Mini-piles for FC7B Alternative Proposed Mini-piles for FC9B	40 25NOV11 40 16APR12	25FEB12 12JUL12		00	Alternative Proposed Mini-piles for FC/B
Sec. 1	Proof Drilling for FC10B (2 nos)		12JUL12 22SEP11		00	Proof Drilling for FC10B (2 nos)
總統	Proof Drilling for FC8B (2 nos)		08DEC11		00	■ Floor Drilling for FC8B (2 nos)
	Proof Drilling for FC7B (2 nos)	14 21MAR12		· · · · · · · · · · · · · · · · · · ·	00	■ Froor Drilling for FC7B (2 nos)
	Proof Drilling for FC9B (2 nos)	14 03SEP12			00	► Proof Drilling for FC9B (2 nos)
	Load Test for extg Pile at FC8B & FC10B (2 nos)	20 30AUG11			00	Load Test for extg Pile at FC8B & FC10B (2 nos)
	Load Test for extg Pile at FC7B (1 no)		04OCT11		00	Load Test for extg Pile at FC7B (1 no)
	Load Test for extg Pile at FC9B (1 no)	10 13AUG12			00	Load Test for extg Pile at FC9B (1
20190	Load Test for Altern. Proposed Mini-pile (1 no)	10 02AUG12	12AUG12	1	00	Load Test for Altern. Proposed Mini-
20200	Pre-drilling Works for Washout Chamber (1 no)	14 19MAY10	25MAY10	1	00	Pre-drilling Works for Washout Chamber (1 no)
Start date	29JAN10 Early bar					
Finish date	09MAY14 Progress bar					23
Data date Run date	29DEC13 06JAN14 Critical bar					China Harbour Engineering Co. Ltd.
Page number	er 2A Summary bar					TPSTW Stage 5 Phase 2B
	era Systems, Inc. Start milestone point Finish milestone point					
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Acg chamber Image: Sludge Drawoff Chamber C1B & Pipework Dewatering House wide Drawoff Chamber 4 wide Drawoff Chamber 4 wide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Chamber 4 wide Drawoff Chamber 4 vide Drawoff Chamber 4 wide Drawoff Chamber 4 vide Drawoff Chamber 4 wide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Chamber 4 vide Drawoff Ch						
kg chamber Image: Sludge Drawoff Chamber C1B & Pipework Dewatering House wid Drawoff Chamber 4 wid Drawoff Chamber 4 (VO13) ctification of Draw-off Chamber 4 Vatertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) Section II of Works Backfilling						
ct chamber Sludge Drawoff Chamber C1B & Pipework Dewatering House w Drawoff Chamber 4 v Drawoff Chamber 4 v Drawoff Chamber 4 (VO13) ctification of Draw-off Chamber 4 vatertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works ection II of Works						
ct chamber Sludge Drawoff Chamber C1B & Pipework Dewatering House w Drawoff Chamber 4 v Drawoff Chamber 4 v Drawoff Chamber 4 (VO13) ctification of Draw-off Chamber 4 vatertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works ection II of Works						
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g chamber Sludge Drawoff Chamber C1B & Pipework ewatering House w Drawoff Chamber 4 / Drawoff Chamber 4 / Drawoff Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works ection II of Works						
g chamber Sludge Drawoff Chamber C1B & Pipework ewatering House v Drawoff Chamber 4 / Drawoff Chamber 4 / Drawoff Chamber 4 itification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works ection II of Works						
v Drawoff Chamber 4 / VO13) Backfilling for new Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13)					· ·	
ewatering House v Drawoff Chamber 4 / Drawoff Chamber 4 itification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works						
evaluation of Draw-off Chamber 4 VO13) tification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) cetion II of Works						
vO13) utification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works	ewatering House	je Drawoff C	hamber C1B &	& Pipework		
vO13) tification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) ection II of Works	Drawoff Chambe	er 4				
<pre>tification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) action II of Works o)</pre>		л 4		· · · · · · · ·	• • • • • • • • • • • • • • • • • • • •	
<pre>tification of Draw-off Chamber 4 atertightness test for Drawoff Chamber 4 (VO13) Backfilling for new Drawoff Chamber 4 (VO13) action II of Works o)</pre>	VO13)	· .				
ection II of Works	tification of Draw-	off Chamber	r 4 Chamber 4 (V	O13)		
O() III of Works IIII of Works II	Backfilling for	new Drawof	f Chamber 4 (VO13)		- :::
option II of Works option II of Works						
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Date Revision Checked Approved						
APR12 D AA TKC	Date		evision		Approved	
AUG13 F AA TKC	Date Date Date	D	evision	AA	TKC	-
JAN14 G AA TKC	Dile (1 no)	D E F	evision	AA AA AA	TKC TKC TKC	-

Act Description	Orig Early Early Total % 2010 2011 2012 2013 2014 2015
	Dur Start Finish Float 2010 2011 2012 2013 2013 2014 2015 2015 2017 Start Finish Float FMAMJJASONDJFMAMJY
Final Clarifier No. FC7B to FC10B	
21010 Excavation for FC10B	30 27SEP11 15JUN12 100
21020 Pile Head Construction for FC10B	35 01NOV11 03JUL12 100
21030 Base Slab for FC10B	20 05DEC11 03AUG12 100 Base Slab for FC10B
21040 Structural Wall for FC10B	30 04AUG12 08SEP12 100 25 04OCT12 12OCT12 100
21050 Watertightness Test for FC10B	
21060 Concrete Coating for FC10B 21070 Backfilling for FC10B	
21070 Backlining for PC10B	20 130CT12 06NOV12 100 30 28NOV11 13APR12 100
21090 Pile Head Construction for FC8B	35 30JAN12 27APR12 100
21100 Base Slab for FC8B	20 20FEB12 01JUN12 100
21110 Structural Wall for FC8B	45 02JUN12 17JUL12 100
21120 Watertightness Test for FC8B	25 03AUG12 07SEP12 100
21130 Concrete Coating for FC8B	10 02APR13 25APR13 100
21140 Backfilling for FC8B	20 13SEP12 06NOV12 100
21150 Excavation for FC9B	20 13SEP12 06NOV12 100 20 05OCT12 24DEC12 100
21160 Pile Head construction for FC9B	30 26OCT12 24DEC12 100
21170 Base Slab for FC9B	20 07NOV12 16JAN13 100
21180 Structural Wall for FC9B	30 17JAN13 05FEB13 100
21190 Watertightness for FC9B	25 06FEB13 15MAR13 100
21200 Concrete Coating for FC9B	10 26APR13 30JUL13 100
21210 Backfilling for FC9B	21 16MAR13 02MAY13 100 100 100 100 100 100 100 100 100 1
21220 Excavation for FC7B	30 06FEB13 29MAY13 100 35 01MAR13 05JUN13 100
21230 Pile Head Construction for FC7B	35 01MAR13 05JUN13 100
21240 Base Slab for FC7B	20 01JUN13 27JUN13 100
21250 Structural Wall for FC7B	25 28JUN13 10AUG13 100
21260 Watertightness Test for FC7B	25 11AUG13 03SEP13 100
21270 Concrete Coating for FC7B	10 17SEP13 21OCT13 100
21280 Backfilling for FC7B	20 16SEP13 08OCT13 100
Pipeline Works	
22002 DN700 DI Pipe % FC8B & extg chamber	30 21SEP12 10OCT12 100
22004 DN700 DI Pipe % FC10B & extg chamber	30 21SEP12 100CT12 100 30 21SEP12 100CT12 100
22006 DN700 DI Pipe % FC9B & extg chamber	30 11DEC12 26MAR13 100 30 17MAY13 05JUN13 100
22008 DN700 DI Pipe % FC7B & extg chamber	
22010 DN500 DI Pipe % FC10B & new Drawoff Chamber 4 22020 DN500 DI Pipe % FC9B & new Drawoff Chamber 4	
22020 DN500 DI Pipe % FC9B & new Drawoff Chamber 4 22030 DN500 DI Pipe % FC7B & new Drawoff Chamber 3	30 22NOV12 27NOV12 100 30 11MAY13 21MAY13 100
22030 DN500 DI Pipe % FC/B & new Drawoff Chamber 3	15 020CT13 050CT13 100
22050 Excavation of Inspection Pit T8	20 21DEC10 23DEC10 100 [Excavation of Inspection Pit T8
22060 Sealing DN600 & DN800 Scum Pipes at RAS	10 180CT11 01NOV11 100 Sealing DN600 & DN800 Scum Pipes at RAS
22070 Removal of extg 3 nos. of dosing pipes & trench	15 07JAN12 03MAR12 100
22080 Removal of DN800 Sludge Pipe for piling	15 01DEC11 08MAR12 100
22090 Removal of DN600 Sludge Pipe	30 28JAN13 08MAR13 100
22100 Construction of FMC2B	60 20JUN12 08DEC12 100
22110 Modification of RAS Pumping Station (Sealing)	60 22JAN13 28FEB13 100
22115 Modification of RAS Pumping Station (Structure)	45 18NOV13 04DEC13 100
22120 DN1000 DI Sludge Pipe	30 21JAN13 28FEB13 100
22130 Backfilling for DN1000 Sludge Pipe	17 01MAR13 09MAR13 100 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
22140 Construction of FMC1B + removal of DN800 pipe	45 17NQV11 31AUG12 100
22150 Backfilling for FMC1B	25 29SEP12 24OCT12 100
Variation Order	
23010 Pre-drilling for new Drawoff Chamber 3 (1 no)	7 25JUN11 02JUL11 100
23020 1st Delimotion of extg Drawoff Chamber 3 (VO13)	20 30NOV11 05DEC11 100 ►I 1st Delimotion of extg Drawoff Chamber 3 (VO13)
23030 Mini-piling for new Drawoff Chamber 3 (2 nos)	30 05NOV12 29NOV12 100 Mini-piling for new Drawoff Chamber 3 (2 nos)
23032 ELS for Drawoff Chamber 3	20 21 JAN13 23 FEB 13 100 ELS for Drawoff Chamber 3
23035 2nd Demolition of extg Drawoff Chamber 3 (VO13)	10 04FEB13 23FEB13 100 2nd Demolition of extg Drawoff Chamber 3 (VO13)
Start date 29JAN10 Early bar	Date Revision Checked Approve
Finish date 09MAY14 Progress bar	23APR12 D AA TKC
Data date 29DEC13	China Harbour Engineering Co. Ltd.
Run date 06JAN14 Summany bar	Official Lingingering CC. Etc.Official ConstraintsOfficial Constraint
Page number 3A Summary bar c Primavera Systems, Inc. Image: Start milestone point Image: Start milestone point	
Finish milestone point	

Act	Description	Orig	Early	Early	Total	þ	2010)		2011		2012			2013	
ID		Dur	Start	Finish	Float	F.N	MAMJJ	AS	ONDJFM/	AMJJASO	NDJFM	AMJJ	ASONT	JFM		
23040	Construction of new Drawoff Chamber 3 (VO13)	_	25FEB13	12JUL13		00										Cons
23045	Watertightness Test for Drawoff Chamber 3 (VO13)			02OCT13	· f	00										
Service Company and Company	Backfilling for new Drawoff Chamber 3 (VO13)	30	0900113	02NOV13	1	00									<u> </u>	
2	of Works															
Drilling		<u> </u>				00	Natification	 	 Engineer							
30001	Notification from Engineer		02APR10			00	Notification		l Engineer							
30010	Section III of Works Site Clearance		03MAY10	1	1	95			l Clearance						2010/07/0000000300/2010/2010/2010/2010	l
30020		_	28MAY10	02OCT10		00			Pre-drilling for PS	T5 AT5~AT7 (/1)	() ()					1
18 E	Pre-drilling for PST5, AT5~AT7 (41 nos) Pre-drilling for Mixed Liquor Channel 1 (25 nos)				+ · · · ·	_			e-drilling for Mixed I	1 1 1	1 .					
30040	Pre-drilling for Mixed Liquor Channel 2 (6 nos)	_		24AUG10 150CT10		00		11.1	Pre-drilling for M	1° 1 1						
30050	Prelimiary Socketted H-piling	_	180CT10			00			Prelimiary Sock	1 1						
30070	Load Test for Preliminary Socketted H-pile	14		27NOV10		00			11 ·	r Preliminary Sock	 etted H-nile					
30080	Socketted H-piling for PST5, AT5~AT7 (174 nos)	263				00				ocketted H-piling for	-	 T7 (174 no:	5)			
30090	Proof Drilling for PST5 & AT5-AT7 (174 hos)	- · · ·	21MAR11		· · · ·	00			I i	Proof Drilling for P	1	1				
30100	Load Test for Socketted H-pile (2 nos)	14		31MAR11		00			I I I	Load Test for Sock	1	1 · · · · ·				
30110	Pre-drilling for Sludge Digestion Tank (7 nos)		28AUG10			00		→		Sludge Digestion T						
30120	Socketted H-piling for SD Tank (29 nos)			22MAR11	t · · · · · ·	00		Π	11 10	locketted H-piling f	1	nos)				
30120	Proof Drilling for Sludge Digestion Tank (2 no)			03JUN11		00			1 1111	Proof Drilling		1 1	(2 no)			
30140	Load Test for Sludge Digestion Tank (2 no)		01APR11	12APR11		00				Load Test for Slud		1 1			1	
30140	Preliminary Mini-pile for Mixed Liquor Channel	- I		29NOV10		00			I .	Mini-pile for Mixed		4 1 1				. ·
30160	Load Test for Preliminary Mini-pile (1 no)		03JAN11	10JAN11	+	00				st for Preliminary	1 ·					
30170	Mini-pilling for Mixed Liquor Channel (43 nos)	_	03NOV10			00		C	Mini-pi	· · ·		nos)				
30180	Mini-piling for Mixed Liquor Channel (16 nos)			07MAY11		00			H · FH -	Mini-piling for M	1	1 1	os)			
30190	Mini-piling for MLC (M60~M67)	_	31MAY11			00				Mini-piling f	1	1 1				
30200	Mini-piling for MLC (M68~M79)		28NOV11		4	00					1 1 11 11 1 1 1 1 1 1 1		for MLC (M6	8~M79)		
30210	Mini-piling for MLC (M17 & M20) (VO97)	45				00									ling for ML	.C (M
30220	Proof Drilling for Miixed Liquor Channel (1 no)	7	25JUL11	29JUL11		00				Proof D	rilling for Miixed	Liquor Cha	annel (1 no)			
1986 824	Remaining Proof Drilling for MLC (1 no)	14	08OCT12	170CT12		00							Rem	aining Pro	of Drilling f	for M
188 ×	Proof Drillig for add. 4 piles of MLC (VO97)	14	04FEB13	02MAR13	1	00	· ·							Pr 🔤 Pr	roof Drillig	for a
30240	Load Test for Mixed Liquor Channel (1 no)	14	20APR12	27APR12	1	00					L	Load Te	st for Mixed L	iquor Cha	nnel (1 no))
30250	Pre-drilling for Bio-gas Holding Tank (3 nos)	10	20JUL10	26AUG10	1	00		Pr	e-drilling for Bio-ga	s Holding Tank (3	nos)					•
30260	Mini-piling for Bio-gas Holding Tank (4+8 nos)	52	10JAN11	03MAR11	1	00				ni-piling for Bio-gas						
30270	Proof Drilling for Bio-gas Holding Tank (1 no)	7	11APR11	05MAY11	1	00			₽►	Proof Drilling to	r Bio-gas Holdin	g Tank (1 r	າວ			
30300	Load Test for Bio-gas Holding Tank Area (1 no)	14	04APR11	11APR11	1	00				Load Test for Bio-	gas Holding Ta	nk Area (1 r	10)			
Primary	Sedimentation Tank & Aeration Tank															
31000	Excavation for AT5 & AT6 1st pour		17MAR11			00					r AT5 & AT6 1s	ur - 1				
31010	Excavation for AT5 & AT6 2nd pour		26MAY11		1	00					avation for AT5	I F	. D			·
31020	Pile Head for AT5 & AT6 1st pour (63 nos)		-		+	00			↓		for AT5 & AT6					
120 Pet	Pile Head for AT5 & AT6 2nd pour (45 nos)	_	08JUL11	17SEP11		00		•			e Head for AT5	1 1	pour (45 nos)			· ·
31040	Pile Cap for AT5 & AT6 1st pour			03AUG11		00				<u> </u>	p for AT5 & AT	[] [*] [·
8 6 m	Pile Cap for AT5 & AT6 2nd pour		1	040CT11		00				<u> </u> ↓ [↓] ▶⊠∯	ile Cap for AT5		al I			
88 S	Structural Wall for AT5 & AT6 1st pour (14pours)		04AUG11		<u> </u>	00						1 F	T5 & AT6 1st		1	
38.83	Structural Wall for AT5 & AT6 2nd pour (10pours)		05OCT11		+ · · · · · ·	00	1 ·					1 1	for AT5 & AT	11	ir (10pours	9
200 No.	Watertightness Test for AT5			16MAR12	+	00					1		ess Test for A			
255 AS	Watertightness Test for AT6				1 (00								TOT A 16		
· 🎆 😤	Backfilling for AT5		03MAR12			00						Backfilling				
※ 127	Backfilling for AT6		30MAY12			00							Backfilling fo	סוא זע 		
- Mar	Excavation for Effluent Chamber		01AUG11			00					Excavation	E E	11 I I	、	1	
28 X	Pile Head for Effluent Chamber (15 nos)					00					Pile Head for E			י		
線約	Pile Cap for Effluent Chamber		02DEC11	15DEC11		00			· ·					l tChamba	r .	
[[[[[]]]]][[[]]]][[]]][[]]][[]]][[]]][[]]][[]]][[]]][[]]][[]]][[]]][[]]][[]][[]]][[]][[]]][[]][[]]][[]][[]]][[]][[]][[]][[]]][[][]	Structural Wall for Effluent Chamber		16DEC11			00							all for Effluen			
266 BC	Top Slab & Upstand Wall of Effluent Chamber			31MAR12	<u> </u>	00							Watertightr			
38 S.	Watertightness for Effluent Launder			13AUG12		00							ion for PST5	icee i∪t ⊏t 		
< < < < > < < < < < < < < < < < < < <	Excavation for PST5 Provision of Plotform for Add Load Test (VOS6)		01AUG11			00							of Platform 1	 for Add Lo	 had Test A	 /056
	Provision of Platform for Add. Load Test (VO56)	15	11APR12	ZTAPR12	1	00	1									
Start date	29JAN10 Early bar 09MAY14 Progress bar													-		23
Finish date Data date	20DEC13						China I	ا م ساد			4					18
Run date	06JAN14								our Enginee	-	4.					03
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c Primave	era Systems, Inc. Start milestone point															-
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SONDJEN	2014 1 A M J J A S O N D	20 JFMA	15 M.J.J.A.:
Watertightness	awoff Chamber 3 (VO13) Test for Drawoff Chamber 3 or new Drawoff Chamber 3 (\	(VO13) /O13)	
Sec	tion III of Works		
; 117 & M20) (VO97) ; LC (1 no)			
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6)			
	Revision	Checked	Approved

Act	Orig Early Total _{o/ 2010} 2011 2012 2013 2014 2015
ID Description	Dur Start Finish Float 6 2010 2011 2012 2013 2014 2015 Dur Start Finish Float FMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJASONDJFMAMJJAS
31215 Add. Load Test for AT7 (VO56)	11 02MAY12 12MAY12 100 → Add. Load Test for AT7 (VO56)
31218 Excavation for AT7	15 09JAN12 22JUN12 100 Excavation for AT7
31220 Pile Head for PST5 Pipe Chamber (6 nos)	14 19AUG11 04OCT11 100 Pile Head for PST5 Pipe Chamber (6 nos)
31230 Pile Cap for PST5 Pipe Chamber up to base soffit	30 17OCT11 04NOV11 100
31240 Pile Head for AT7 (30 nos)	20 01FEB12 12JUN12 100 Pile Head for AT7 (30 nos)
31245 Pile Head for PST5 (15 nos)	28 01FEB12 23APR12 100
31250 Pile Cap for AT7	30 13FEB12 16JUL12 100
31255 Pile Cap for PST5	30 23MAR12 08MAY12 100 File Cap for PST5
31260 Structural Wall for PST5 & AT7 (10 pours)	60 22FEB12 04OCT12 100
31270 Watertightness Test for PST5 & AT7	21 08SEP12 30NOV12 100 Watertightness Test for PST5 & AT7
31280 Backfilling for PST5 & AT7	15 29OCT12 14DEC12 100
31290 Details of Sludge Digestion Tank No. 3	30 28FEB12 24APR12 100 Details of Sludge Digestion Tank No. 3
31300 Excavation for Sludge Digestion Tank No.3 (SDT3)	35 21MAY12 260CT12 100 Excavation for Sludge Digestion Tank No.3 (SDT3)
31310 Pile Head Construction for SDT3 (29 nos)	20 15SEP12 17OCT12 100 100 100 100 100 100 100 100 100 1
31320 Base Slab for SDT3	30 30OCT12 21NOV12 100 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
31325 Backfilling + Removing Struts for SDT3	30 22NOV12 24DEC12 100 Backfilling + Removing Struts for SDT3
31330 Structural Wall for SDT3	50 25DEC12 25MAY13 100
31340 Inclined Top Slab for SDT3	45 19APR13 25MAY13 100
31345 Installation of Bulkhead Door for SDT3	30 05OCT13 12OCT13 100
31350 Watertightness Test for SDT3	20 27DEC13 14JAN14 0 15
31360 Air Tightness Test for SDT3	7 15JAN14 21JAN14 0 0
31370 Backfilling for SDT3	13 22JAN14 03FEB14 0 0
31380 Lagging for SDT3	55 04FEB14 30MAR14 0 0
31400 Excavation for MCL Bay 7 + Foam Removal House	10 27OCT11 07NOV11 100
31410 Pile Cap for MLC Bay 7 + Foam Removal House	30 07SEP11 07DEC11 100
31420 Construction of MLC Bay 7 + Foam Removal House	60 08NOV11 09MAR12 100
31500 Excavation for MLC (Bay 4&5)	15 11APR12 160 → <td< td=""></td<>
31505 Excavation for MLC (Bay 1~2)	
31508 Excavation for MLC (Bay 3 & 6)	15 27FEB13 11MAR13 100 ► Excavation for MLC (Bay 3 & 6)
31510 Pile Cap + Structural Wall for MLC (Bay 4&5)	60 11MAY12 18JAN13 100
31520 Pile Cap + Structural Wall for MLC (Bay 1~2)	60 22OCT12 31DEC12 100
31525 Construction of residual cantilever slab of AT6	30 01JAN13 22JAN13 100
31530 Pile Cap + Structural Wall for MLC (Bay 3 & 6)	60 12MAR13 26JUN13 100
31550 Concreting surround for DN1500 Concrete Pipe	30 17SEP12 10DEC12 100
31600 Excavation for MLC (Bay 8&9)	30 14JAN13 13MAR13 100 Excavation for MLC (Bay 8&9)
31610 Pile Cap for MLC (Bay 8-1 & 9)	45 28JAN13 18APR13 100
31620 Structural Wall for MLC (Bay 8-1 & 9)	40 02MAR13 21MAY13 100
31625 Pile Cap + Structural Wall for MLC (Bay 8-2)	40 25MAR13 21MAY13 100 Pile Cap + Structural Wall for MLC (Bay 8-2)
31630 Watertightness Test for MLC (Bay 4 ~9)	15 23MAY13 20JUN13 100
31633 Watertightness Test for MLC (Bay 1~3)	15 18JUL13 25JUL13 100
31635 Concrete Coating for MLC	30 28JUN13 19SEP13 100
31640 Backfilling for MLC	30 03FEB14 04MAR14 26d 0
31700 Excavation for Bio-gas Holding Tank Support	10 29APR11 09JUL11 100
31710 Pile Head for Bio-gas Holding Tank Support	15 11MAY11 05JUL11 100
31720 Construction of Bio-gas Holding Tank Support	20 11JUL11 13AUG11 100
31800 Excavation for Valve Chamber	20 18AUG11 04NOV11 100
31810 Pile Head Construction for Valve Chamber	15 110CT11 260CT11 100 Pile Head Construction for Valve Chamber
31820 Pile Cap for Tank Support & Valve Chamber	30 05OCT11 26NOV11 100 Pile Cap for Tank Support & Valve Chamber
31830 Structural Wall for Valve Chamber	40 28NOV11 17JAN12 100
31840 Backfilling for Valve Chamber	30 28JAN12 24SEP12 100 Backfilling for Valve Chamber
Pipeline Works	
32000 Excavating Trial Pit No. T1 & T2 (SI01)	20 18JUN10 06AUG10 100 Excavating Trial Pit No. T1 & T2 (SI01)
32001 Diversion of DN150 Fire Fighting Main at SDT3	30 25AUG10 23OCT10 100 Investion of DN150 Fire Fighting Main at SDT3
32002 Diversion of DN80 Wash Water Pipe at SDT3	30 20SEP10 23OCT10 100 and Diversion of DN80 Wash Water Pipe at SDT3
32003 Diversion of PE Sewage Pipe at SDT3 (RFI/43)	30 18OCT10 22OCT10 100 Diversion of PE Sewage Pipe at SDT3 (RFI/43)
32005 Pipework for AT5 ~ AT7	98 13APR12 22JUN12 100 Pipework for AT5 ~ AT7
Start date 29JAN10 Early bar	Date Revision Checked Approved
Finish date 09MAY14 Progress har	23APR12 D AA TKC
Data date 29DEC13	China Harbour Engineering Co. Ltd.
Run date 06JAN14 Page number 5A	Official analysis F AA TKC TPSTW Stage 5 Phase 2B 06JAN14 G AA TKC
c Primavera Systems, Inc. Start milestone point	
Finish milestone point	

Act Description	Orig Early Early Total Dur Start Finish Float [%]	2010 2011 2011 2011 FMAMJJASONDJFMAMJJASONDJFMAMJ	2 2013 1 A S O N D L E M A M L L A S O	2014 2015 NDIEMAMJJASONDJEMAMJJAS
32006 Pipework for Pipe Chamber @PST5	98 07MAR13 26OCT13 100			Pipework for Pipe Chamber @PST5
32020 Pipework for Effluent Chamber	19 290CT12 03NOV12 100		► Pipework for Effluent Chamber	
32025 Pipe Support at Effluent Launder (PVO)	30 02JAN13 23JAN13 100		Pipe Support at Effluent La	under (PVO)
32030 DN900 Sewage Pipe to PST5	90 09AUG12 10NOV12 100		DN900 Sewage Pipe to PST5	
32040 Pipework for SDT3	30 21SEP13 02OCT13 100			bework for SDT3
32070 Pipework for Valve Chamber	29 07NOV11 13AUG12 100		Pipework for Valve Chamber	
32080 DN1500 Air Main	90 08AUG11 30MAY13 100		DN1500 Air Ma	ain
32083 Pipe Support for DN1500 Air Main @CBC	45 15JUL13 28SEP13 100		Pip	e Support for DN1500 Air Main @CBC
32086 Pipe Support for DN1500 Air Main @AT7	15 29DEC13 12JAN14 77d 0			Pipe Support for DN1500 Air Main @AT7
32090 Gas Pipe to Gas Transfer Station	60 20FEB14 20APR14 -21d 0			Gas Pipe to Gas Transfer Station
32100 Gas Pipe connecting Gas Holder Tank	60 20FEB14 20APR14 -21d 0			Gas Pipe connecting Gas Holder Tank
Modification / Removal Works				
33010 Removal of extg Control Room	30 15AUG11 08MAR13 100		Removal of extg Contro	bi Room
33020 Modi. of Chemical House for Switch Room (VO57)	90 21NOV11 05OCT12 100		Modi. of Chemical House for Switch F	Room (VO57)
33030 Modi. of extg Flow Splitter Box Stage I (VO16)	60 02MAR13 19JUL13 100		Modi. of e	xtg Flow Splitter Box Stage I (VO16)
33040 Modi. of extg Flow Splitter Box Stage II (VO16)	60 08JUL13 03SEP13 100		Modi.	of extg Flow Splitter Box Stage II (VO16)
33050 Modification of extg Aeration Tank No. 4	30 01JAN14 30JAN14 59d 0			Modification of extg Aeration Tank No. 4
33060 Modification of extg Aeration Tank No. 1~3	60 11MAR14 09MAY14 -40d 0			Modification of extg Aeration Tank No. 1~3
33070 Modi. of extg Effluent Launder (EL) Stage I	60 02MAR13 25MAR13 100		Modi. of extg Effluent	Launder (EL) Stage I
33075 Sealing channel from EL to Flow Splitter Box	30 11MAR14 09APR14 -10d 0			Sealing channel from EL to Flow Splitter Box
33080 Shelter for NaOCI Dosing System	60 29AUG13 29OCT13 100			Shelter for NaOCI Dosing System
33090 Watertightness Test for NaOCI Dosing Shelter	15 21SEP13 03OCT13 100			atertightness Test for NaOCI Dosing Shelter
Variation Order				
33100 Sealing openings for E&MP for SDT3 (VO/128)	0 04DEC13 14DEC13 100			Sealing openings for E&MP for SDT3 (VO/128)
33110 Temporary diversion of extg air main at AT4	10 21DEC13 31DEC13 59d 70			Temporary diversion of extg air main at AT4
33120 Walkway on conc. bridge at SDT3 (VO124)	20 02FEB14 21FEB14 2d 0			Walkway on conc. bridge at SDT3 (VO124)
Section IV of Works				
Drilling Works				
40010 Section IV of Works	384 29JAN10 22APR14 -1161d 68			Section IV of Works
40020 Pre-drilling for Decanting Chamber (1 no)	7 06MAY10 11MAY10 100	Pre-drilling for Decanting Chamber (1 no)		
40030 Dismantling Extg Cantilever of PSGT (VO02)	14 22JUL10 02AUG10 100	Dismantling Extg Cantilever of PSGT (VO02)		
40040 Mini-piling for Decanting Chamber (4 nos)	28 27AUG10 130CT10 100	Mini-piling for Decanting Chamber (4 nos)		
40050 Proof Drilling (2 nos)	28 190CT10 260CT10 100	Figure 1 Proof Drilling (2 nos)		
Structural Works	· · · · · · · · · · · · · · · · · · ·			
41010 Excavation for Decanting Chamber	10 270CT10 03NOV10 100	Excavation for Decanting Chamber		
41020 Pile Cap for Decanting Chamber	20 04NOV10 15DEC10 100	Pile Cap for Decanting Chamber		
41030 Structural Wall for Decanting Chamber	30 16DEC10 31JAN11 100	Structural Wall for Decanting Chamber		
41040 FRP Cover for Decanting Chamber	20 28SEP12 17OCT12 100		FRP Cover for Decanting Chamber	
41050 Excavation for Chemical & Oil Store	15 04AUG10 19AUG10 100	Excavation for Chemical & Oil Store		
41060 Base Slab for Chemical & Oil Store	20 20AUG10 13SEP10 100	Base Slab for Chemical & Oil Store		
41070 Structural Wall for Chemical & Oil Store	40 14SEP10 01NOV10 100	Structural Wall for Chemical & Oil Store		
41080 Top Slab for Chemical & Oil Store	20 25OCT10 01NOV10 100	Top Slab for Chemical & Oil Store		
41090 Conc. Plinth at CHPG Stage I/II (VO64)	120 07FEB12 07FEB13 100		Conc. Plinth at CHPG Sta	
41100 Conc. Plinth at Waste Burner (VO60)	120 07FEB12 26OCT12 100		Conc. Plinth at Waste Burner (VO6	0)
Modification / Removal Works				
42010 Removal of Chemical Waste Room	30 23JUL10 24JUL10 100	Removal of Chemical Waste Room		
42020 Removal of Flower Bed	20 12JUL10 280CT10 100	Removal of Flower Bed		
42030 Removal of Waste Bio-gas Burner at Stage I/II	30 20FEB14 21MAR14 9d 0			Removal of Waste Bio-gas Burner at Stage I/II
42040 Removal of Chimney & Associated RC Structure	60 28AUG13 09SEP13 100		Rem	oval of Chimney & Associated RC Structure
42050 Removal of Storage Facilities	30 29AUG12 12SEP12 100		►■ Removal of Storage Facilities	
42060 Structures for RO Plant (VO97)	120 09NOV12 29JUL13 100		Structure	es for RO Plant (VO97)
42070 Shelter for FeCl3 Dosing System	60 11NOV10 15DEC10 100	Shelter for FeCl3 Dosing System		
42080 Rectification of Shelter for FeCl3 Dosing System	15 10JAN11 22JAN11 100	Rectification of Shelter for FeCl3 Dosing System		
42090 Steelwork for FeCl3 Dosing Shelter	30 20DEC10 30APR11 100	Steelwork for FeCl3 Dosing Shelter		
42100 Watertightness Test for FeCl3 Dosing Shelter	16 14MAR11 27MAR11 100	➡■ Watertightness Test for FeCl3 Dosing Shelte	r III	
42110 Removal of FeCl3 Dosing System	60 14APR12 20APR12 100		al of FeCl3 Dosing System	
				Date Revision Checked Approve
Finish date 29JAN10 Finish date 09MAY14 Progress bar			23APR1	2 D AA TKC
Data date 29DEC13		China Harbour Engineering Co. Ltd.	18JAN1	
Run date 06JAN14		TPSTW Stage 5 Phase 2B	03AUG1	
Page number 6A Summary bar c Primavera Systems, Inc. Start milestone point		IT UTT ULAYE U FILAZE ZD	06JAN14	4 G AA TKC
Finish milestone point				
	· · · ·			

Act ID	Description	Orig Early Dur Start	Early Finish	Total Float	2010 MANJJASO	2011 NDJEMAMJJASONDJEMAM	2012 2013 2014 20 J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A
42120 N	Modifi of Central Blg Complex (VO43)	770 10NOV11		0 88			Modifi of Central Blg Complex (VO43)
	Addification of SAS Thickening House (VO53)	120 14DEC12		100			Modification of SAS Thickening House (VO53)
	Aodi. of Primary Sludge Gravity Thickener (VO02)	60 22DEC10	12NOV12	100			Modi. of Primary Sludge Gravity Thickener (VO02)
42150 M	Addification of Filtrate Treatment Plant (VO33)	120 10JAN13	05SEP13	100		· · · ·	Modification of Filtrate Treatment Plant (VO33)
42160 N	Addification of Chlorination House (VO18)	150 07NOV11	19FEB13	100			Modification of Chlorination House (VO18)
	Floor Opening at Service Tower Building (16 nos)	30 24OCT11	310CT11	100		Floor Opening at Ser	vice Tower Building (16 nos)
	Nodi. of Genset Rm at Inlet Works (VO101)	90 02NOV12		100			Modi. of Genset Rm at Inlet Works (VO101)
1	Removable Handrailing at Inlet Works (VO101)	30 29DEC13		62d 0			Removable Handrailing at Inlet Works (VO1
	Covered Walkway @ Sludge Dewatering House (VO94)	100 22DEC12	23AUG13	100			Covered Walkway @ Sludge Dewatering House (VO94)
and the second sec	ainage Works		<u>.</u>				
	Road & Drainage Works in Portion A	120 12JUL10	15JUN11	100		Road & Drainage Works in Portion	n A
Variation O			·····				
	dditional Works for FeCl3 Dosing System	100 28APR11		100		Additional Works for FeCl3 E	
	Additional Work at Service Tower Building (VO58)	20 18JAN13		100			Additional Work at Service Tower Building (VO58)
·	Puddle at Service Tower Building (VO58)	10 08JAN14		72d 0			Puddle at Service Tower Building (VO58)
	Opening at Service Tower Building (VO58)	35 22FEB14		2d 0			□ L→ Company
	Pipes to Sludge Dewatering House (VO97)	90 20MAY13		100			Pipes to Sludge Dewatering House (VO97)
	Pipes to SAS Thickening House (VO97)	90 12JUN13		100			Pipes to SAS Thickening House (VO97)
	Pipes to Sludge Pumping Station (VO97)	105 03JUN13		100			
	Pipe to Central Building Complex (VO97)	90 03JUL13	30SEP13	100			Pipe to Central Building Complex (VO97)
Section V of							
Landscapin		1					Section V of Works
	Section V of Works	1254 29JAN10		100			
	ree Survey	60 08MAR10	1	100	Tree Survey		
	ree Transplanting & Felling Tree	90 22APR10		100		Tree Transplanting & Felling Tree	
· · · · · · · · · · · · · · · · · · ·	stablishment Works to Transplanted Tree	365 03NOV10		100		Establishment Work	s to Transplanted Tree
1	andscaping Softworks			10d 92			Landscaping Softworks
3	andscaping works around FC7B ~ FC12B	45 14FEB14		0 0			
	andscaping works along AT7 & MLC	45 07FEB14		7d 0			handscaping works along AT7 & MLC
	stablishment Works to Softworks (FC1A~FC10A)	365 12MAR11	11MAR12	100		Establis	hment Works to Softworks (FC1A~FC10A)
	stablishment Works to Softworks (in Stage I/II)	365 14AUG12		100			Establishment Works to Softworks (in Stage I/II)
	stablishment Works to Other Softworks			10d 0			1 I I I I I I I I I I I I I I I I I I I
	rigation System @circular tanks & UV~RO (VO67)			100			► ■ Irrigation System @circular tanks & UV~RO (VO67)
	rigation System @PSTs & RO Plant (VO67)	45 23MAY13		100		지수는 동안을 물건하는 것이다.	□ Irrigation System (PS Is & RO Plant (VO67)
	rigation System @BHT (VO67)	20 110CT13		100			
	ireen Roof at Sludge Dewatering System	120 05JAN12		100			Roof at Sludge Dewatering System Roof at Transformer House
	ireen Roof at Transformer House	120 05JAN12		100		Green	Roor at Transformer House
·····	stablishment Works to Green Roof	365 14AUG12		100			Big Green Roof at Contractor's Site Office
50120 Gr	reen Roof at Contractor's Site Office	20 28NOV12	T1/DEC12	100			
	iversion of DN600 Consulta Pine	AE ADDAVAG				sion of DN600 Concrete Pipe	
	iversion of DN600 Concrete Pipe	45 18MAY10	+ · · · · · · · · · · · · · · · · · · ·	100		Sion of Divour Concrete Pipe	Road & Drainage Works next FC11B
	oad & Drainage Works next FC11B & FC12B	55 04FEB14					Road & Drainage Works along AT6 & AT7
	oad & Drainage Works along AT6 & AT7	100 27MAR13		7d 60			Road & Drainage Works along MLC Bay 3
	oad & Drainage Works along MLC Bay 3~8	100 25NOV13		46d 60		Cable Ducting and Drawpits	
	able Ducting and Drawpits for FC11B & FC12B	20 18JUL11	1	100		(a) a support of the second s second second seco	e Ducting % CBC & Transformer Hse (16 ducts)
	able Ducting % CBC & Transformer Hse (16 ducts)	60 03NOV11		100			Cable Ducting % CBC & Transformer Hse (10 ducts)
	able Ducting % CBC & Transformer Hse (12 ducts)	60 01MAR12		100			Cable Ducting % CBC & Transformer Hse (12 ducts) Remaining Cable Ducting and Drawpits
Variation Or	emaining Cable Ducting and Drawpits	350 28MAY12	14JAN14	0 95			
		45 0000742			and the second second		■ Pipe from SBR tank to U2 (VO/92)
	pe from SBR tank to U2 (VO/92)	45 09OCT13		100			Add. DN300 drain @ Ext. of Sludge Dewatering Hse
	dd. DN300 drain @ Ext. of Sludge Dewatering Hse	75 29JUL13	den an er er en er	100			Pipe from SAS to VC2 (VO87)
	pe from SAS to VC2 (VO87)	90 29JUL13		100			Modi. of RAS Pump Platform Stage 1 (VO114)
	odi. of RAS Pump Platform Stage 1 (VO114)	30 05AUG13		100			Modi of RAS Pump Platform Stage 2 (VO11
	odi of RAS Pump Platform Stage 2 (VO114)	30 29DEC13		2d 0			► Model of RAS Pump Platform Stage 3
	odi. of RAS Pump Platform Stage 3 (VO114)	30 27FEB14		2d 0			Concrete paving around FC7B ~ FC12B
	oncrete paving around FC7B ~ FC12B	30 15JAN14	13FEB14	0 0			
art date	29JAN10 Early bar						Date Revision Checked
nish date	09MAY14 29DEC13					_	23APR12 D AA 18JAN13 E AA
ita date in date	06.JAN14					ur Engineering Co. Ltd.	03AUG13 F AA
ge number	7A Summary bar				TPSTW	Stage 5 Phase 2B	06JAN14 G AA
2 Primavera	Systems, Inc. Start milestone point Finish milestone point						
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