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 December 2013

(Version 1.0)

Certified By	Chu (Environmer	ntal Team Leader)
EMARKS:		

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
Introduction	1
Environmental Monitoring and Audit Works	
Environmental Licenses and Permits	
Key Information in the Reporting Month Future Key Issues	2
Background	
Construction Programme Summary of EM&A Requirements	
2 AIR QUALITY MONITORING	
Monitoring Requirements.	
Monitoring Locations	
Monitoring Parameters, Frequency and Duration	
Monitoring Methodology and QA/QC Procedure	8
Instrumentation.	
HVS Installation Filters Preparation	
Operating/Analytical Procedures	9
Maintenance/Calibration	9
Results and Observations	10
3 NOISE MONITORING	11
Monitoring Requirements	11
Monitoring Locations	
Monitoring Equipment	
Monitoring Parameters, Frequency and Duration Monitoring Methodology and QA/QC Procedures	11
Results and Observations	12
4 LANDFILL GAS MONITORING	
Monitoring Requirements Monitoring Locations	14 14
6	
5 ENVIRONMENTAL AUDIT	
Site Audits	15
Review of Environmental Monitoring Procedures Status of Environmental Licensing and Permitting	15 15
Status of Waste Management	17
Status of Waste Management Implementation Status of Environmental Mitigation Measures	17
Summary of Exceedances Implementation Status of Event Action Plans	18
Summary of Complaint and Prosecution	18
6 FUTURE KEY ISSUES	
Monitoring Schedule for the Next Month	18
Construction Program for the Next Month	
7 CONCLUSIONS AND RECOMMENDATIONS	20
Conclusions	
Recommendations	20

LIST OF TABLES

- Table I
 Summary Table for Events Recorded in the Reporting Month
- Table II
 Summary Table for Key Information in the Reporting Month
- Table 1.1Key Project Contacts
- Table 2.1Locations for Air Quality Monitoring
- Table 2.2Air Quality Monitoring Equipment
- Table 2.3
 Impact Dust Monitoring Parameters, Frequency and Duration
- Table 2.4
 Summary Table of Air Quality Monitoring Results during the reporting month
- Table 3.1Location of Noise Monitoring Station
- Table 3.2Noise Monitoring Equipment
- Table 3.3Noise Monitoring Parameters, Frequency and Duration
- Table 3.4
 Summary Table of Noise Monitoring Results during the Reporting Month
- Table 5.1
 Summary of Environmental Licensing and Permit Status
- Table 5.2Observations and Recommendations of Site Audit

LIST OF FIGURE

- Figure 1.1 Site Layout Plan
- Figure 1.2 Locations of Air Quality and Noise Monitoring Stations

LIST OF APPENDICES

- Appendix A Action and Limit Levels
- Appendix B Copies of Calibration Certificates
- Appendix C Environmental Monitoring Schedules
- Appendix D 1-hour TSP Monitoring Results and Graphical Presentations
- Appendix E 24-hour TSP Monitoring Results and Graphical Presentations
- Appendix F Noise Monitoring Results and Graphical Presentations
- Appendix G Summary of Exceedance
- Appendix H Site Audit Summary
- Appendix I Event Action Plans
- Appendix J Updated Environmental Mitigation Implementation Schedule
- Appendix K Waste Generation in the Reporting Month
- Appendix L Complaint Log
- Appendix M Construction Programme

EXECUTIVE SUMMARY

Introduction

- 1. This is the 42nd 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 December 2013.
- 2. The major site activities undertaken in the reporting month included:
 - Cable ducting works ;
 - Construction of Mixed Liquor Channel & Sludge Digestion Tank;
 - Construction of covered walkway on roof of Sludge Dewatering House;
 - Construction of FC7B and Sludge Draw-off No. 3;
 - Pipework for Water Reclamation Facility, SAS Thickening House, SBR Tank, Sludge Dewatering House;
 - Construction of Pipe supports for DN1500 Air Main at Central Building Complex;
 - Installation of Irrigation System;
 - Landscaping works;
 - Modification works at switch room of RAS Pumping Station, Central Building Complex, Filtrate Treatment Plant and Inlet Works;
 - Modification works of Flow Splitter Box;
 - Application of protective coating for FC7B; and
 - Demolition of steel chimney and its RC structure.

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

5. In the reporting month, excavation works were undertaken within the 250m Consultation Zone of Shuen Wan Landfill. Landfill gas monitoring was performed by the Safety Officer of the Contractor. All the measured results were complied with the Limit Levels.

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	Domonia
Event	Number	Nature	Action Taken	Status	Remark
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 (November 2013)	Submitted to EPD on 23 rd December 2013 (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;
 - Construction of Sludge Digestion Tank No. 3;
 - Construction of pipe supports for DN1500 air main;
 - Pipework for Water Reclamation Facility for RO Plant, SAS Thickening House, SBR Tank, Sludge Dewatering House;
 - Drainage and Road works;
 - Finishing works for tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
 - Installation of Irrigation System;
 - Landscaping works;
 - Modification works at CBC, Filtrate Treatment Plant;
 - Modification works of Effluent Launder and Flow Splitter Box;
 - Modification works at Switch Room, Wet Well and RAS Pumps of RAS Pumping Station;
 - Demolition of steel chimney and its RC structure; and
 - Modification works at G/F & 1/F switch room of Inlet Works.
- 9. The future environmental concerns are air quality, noise impacts, waste management and surface runoff from construction works.

1 INTRODUCTION

Background

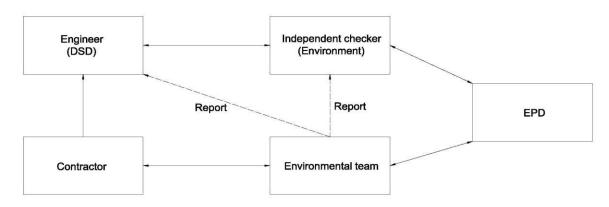
- 1.1 Tai Po Sewage Treatment Works (TPSTW) is located within the Tai Po Industrial Estate. It currently comprises four Stages: I, II, IVA and IVB works. The TPSTW Stage V aims to upgrade the existing STW to provide additional sewage treatment capacity from the present design flow of 88,000 m³/day to 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 42nd monthly EM&A report summarizing the EM&A works for the Project in December 2013.

Project Organizations

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

4

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		
Arup	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	Civil Contractor	Mr. Aaron AU	Site Agent	6345 0754	2603 6899	
		Mr. Jason TSE	Environmental Officer	6628 5739		

Table 1.1Key Project Contacts

5

Construction Programme

- 1.9 The site activities undertaken in the reporting month were:
 - Cable ducting works ;
 - Construction of Mixed Liquor Channel & Sludge Digestion Tank;
 - Construction of covered walkway on roof of Sludge Dewatering House;
 - Construction of FC7B and Sludge Draw-off No. 3;
 - Pipework for Water Reclamation Facility, SAS Thickening House, SBR Tank, Sludge Dewatering House;
 - Construction of Pipe supports for DN1500 Air Main at Central Building Complex;
 - Installation of Irrigation System;
 - Landscaping works;
 - Modification works at switch room of RAS Pumping Station, Central Building Complex, Filtrate Treatment Plant and Inlet Works;
 - Modification works of Flow Splitter Box;
 - Application of protective coating for FC7B; and
 - Demolition of steel chimney and its RC structure.

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

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.

7

ĺ	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

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 ± 3 °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 14 occasions. 24-hr TSP monitoring was carried out as scheduled at each designated monitoring station on 5 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)	49	171	117	315	500	
24-hr TSP (CAM1)	47	136	77	171	260	
1-hr TSP (CAM2)	70	213	137	336	500	
24-hr TSP (CAM2)	52	140	94	177	260	
1-hr TSP (CAM3)	71	209	141	344	500	
24-hr TSP (CAM3)	50	140	91	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	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**.

12

Results and Observations

- 3.9 In the reporting month, noise monitoring during non-restricted hours was conducted as scheduled at the designated location on 5 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	66.2	69.4	68.2	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 6th, 13th, 20th and 27th December 2013 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 13th December 2013. 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**.

Downit / Licongo No	Valid PeriodFromTo		Deteile	Status
Permit / License No.			- Details	Status
Environmental Permi	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	ermit (CNP)			
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.	Valid
Discharge Licence WT00007782-2010	25/10/10	31/10/15	Discharge of industrial trade offluents	Valid
	25/10/10	51/10/15	Discharge of industrial trade effluent: Water Control Zone: Tolo Harbour and Channel Discharge Points: Communal drain for the carriage of surface drainage water	v allo
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

Table 5.1 Summary of Environmental Licensing and Permit Status

Status of Waste Management

5.5 The Construction and Demolition (C&D) materials generated in the reporting month were mainly 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
	29 November 2013	<u>Reminder:</u> Silt in wheel washing bay should be cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 6 December 2013.
	6 December 2013	<u>Reminder:</u> Ponding water should be cleared from near FC9B and FC11B.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 December 2013.
Water Quality	13 December 2013	Reminder: Silt and muddy water in wheel washing bay should be cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 27 December 2013.
	20 December 2013	<u>Observation:</u> Muddy water was observed going to the drainage system directly. The contractor was reminded to treat the water with sedimentation tank before discharge. Also, sandbags should be used to surround the drainage system.	The observation was observed to be improved/rectified by the Contractor during the audit session on 20 December 2013.
Air Quality	6 December 2013	<u>Reminder:</u> Dusty stockpile should be covered by impervious materials or removed to prevent muddy water and dust generation.	The observation was observed to be improved/rectified by the Contractor during the audit session on 13 December 2013.
Noise	N/A	N/A	N/A
Waste / Chemical Management	N/A	N/A	N/A
Permit/ Licenses	N/A	N/A	N/A

Table 5.2Observations and Recommendations of Site Audit

17

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;
 - Construction of Sludge Digestion Tank No. 3;
 - Construction of pipe supports for DN1500 air main;
 - Pipework for Water Reclamation Facility for RO Plant, SAS Thickening House, SBR Tank, Sludge Dewatering House;
 - Drainage and Road works;
 - Finishing works for tanks & pillar box of Water Reclamation Facility, Effluent Launder, Pipe Chamber adjacent to PST5;
 - Installation of Irrigation System;
 - Landscaping works;
 - Modification works at CBC, Filtrate Treatment Plant;
 - Modification works of Effluent Launder and Flow Splitter Box;
 - Modification works at Switch Room, Wet Well and RAS Pumps of RAS Pumping Station;
 - Demolition of steel chimney and its RC structure; and
 - Modification works at G/F & 1/F switch room of Inlet Works.

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.

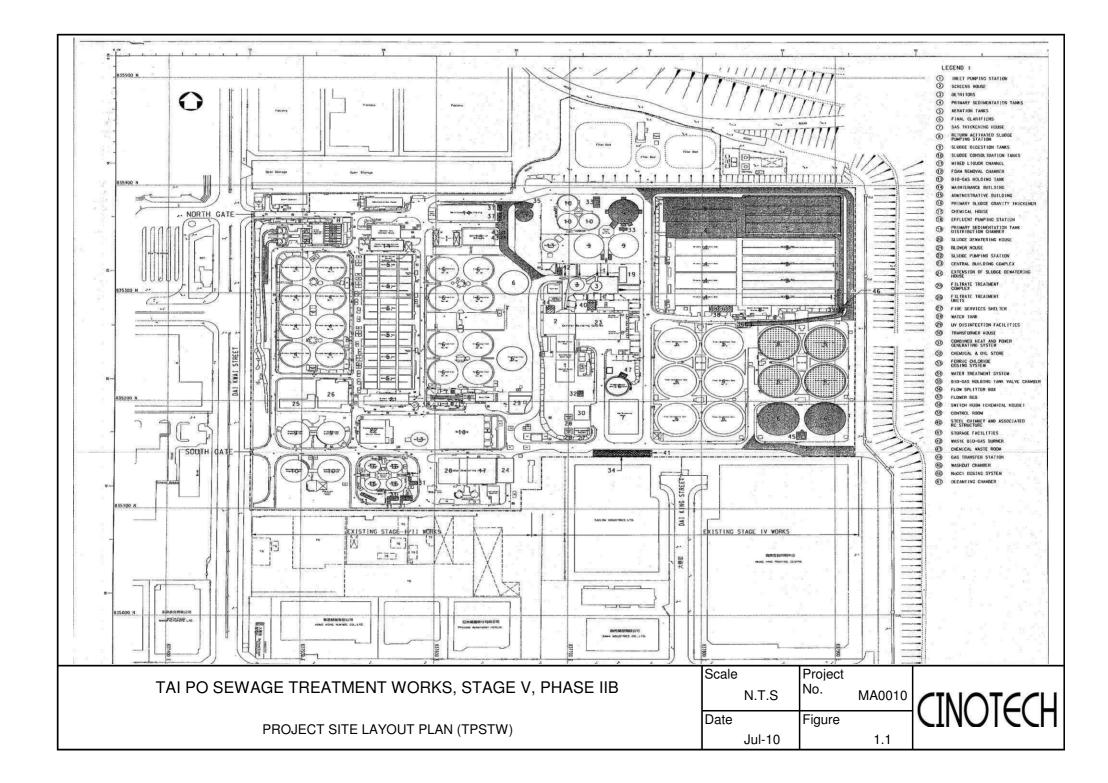
Waste / Chemical Management

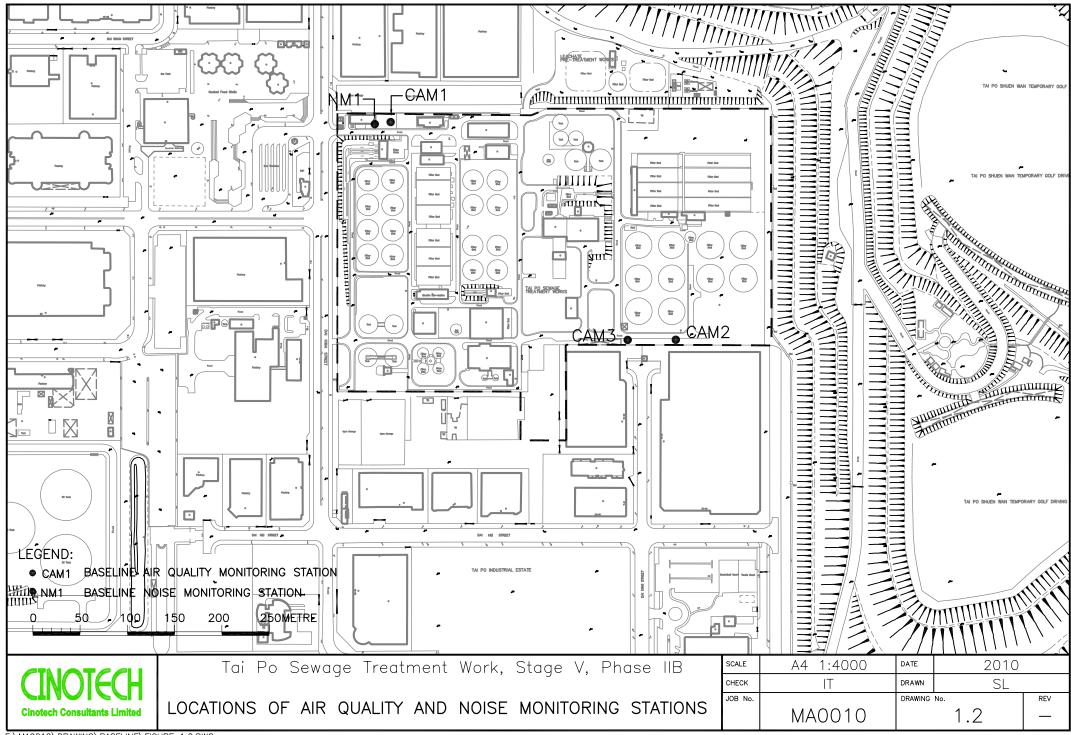
• Avoid accumulation of C&D waste materials or general refuse on site.

20

- 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



						File No.	MA0010/37/0053
Station	CAM1 - Govern	ment Staff Quart	ter	Operator	:WК	<u> </u>	
Date:	23-Oct-13		Next Due Date	:22-Dec	>-13		
Equipment No.:	A-01-37		Serial No.	1704			
			Ambient	Condition			
Temperatu	re Ta (K)	296.8	Pressure, P				
remperatu		290.8	riessuie, ri	а (пшпд)		763.8	
		Oı	rifice Transfer St	andard Inform	nation		
Equipme	ent No.:	A-04-05	Slope, mc	0.0592	Intercep	t, bc	-0.0283
Last Calibra	ation Date:	26-Dec-12		mc x Qstd +	$bc = [\Delta H x (Pa/76)]$	50) x (298/Ta)] ¹	/2
Next Calibr	ation Date:	25-Dec-13		Qstd ≔ {[∆H	x (Pa/760) x (298	/Ta)] ^{1/2} -bc} / m	ıc
		•					
				f TSP Sampler			
Calibration		Or	fice	· · · · ·		HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	0) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil) x (298/Ta)] ^{1/2} Y- axis
1	12.3	3	3.52	59.99	7.8		2.81
2	9.8	3	3.14	53.60	6.2		2.50
3	7.6	2	2.77		5.0		2.25
4	5.2	2	2.29	39.17	3.4		1.85
5	3.4	1	1.85	31.77	2.0		1.42
By Linear Regr	assian of V on V						
Slope , mw =	0.0483			Intercept, bw	-0.076	51	
Correlation c		0.9	980		-0.070	, <u>,</u>	
*If Correlation C				-			
	tion (1996) and a second second						
				Calculation			
From the TSP Fi							
From the Regress	sion Equation, the	e "Y" value accor	rding to				
		mw x Q	Q std + bw = [ΔW	x (Pa/760) x (2	98/Ta)] ^{1/2}		
			_				
Therefore, Se	et Point; W = (m	w x Qstd + bw)*	x (760/Pa)x (Γa / 298) ≔	3.98	,	
Remarks:							
		K (1) (1)					
				*			

Conducted by: <u>WK. 7ang</u> Signature: <u>Nwon</u> Date: <u>23/10/13</u> Checked by: <u>Jr</u> Signature: <u>Date:</u> <u>Date:</u> <u>D3 October 2013</u>



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	

Orifice Transfer Standard Information							
Equipment No.:	A-04-05	Slope, mc	0.0592	Intercept, bc	-0.0283		
Last Calibration Date:	26-Dec-12	mc x Qstd + bc = $[\Delta H x (Pa/760) x (298/Ta)]^{1/2}$					
Next Calibration Date:	25-Dec-13	Qstd = { $[\Delta H x (Pa/760) x (298/Ta)]^{1/2}$ -bc} / mc					

		Calibration o	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	Calculation		a of the state of the fight of the state of the
		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	et Point; W = (m	$w \ge (760 / Pa) =$	Ta / 298) =	3.90	<u> </u>

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



Q3 October 2013

Date:

File No. MA0010/A40/0053

Station	CAM2 - Hung H	ling Printing Centre	3	Operator	: <u>WK</u>	<u>.</u>	
Date:	23-Oct-13	<u>.</u>	Next Due Date:		22-Dec-13		
Equipment No.:	ipment No.: A-01-40				10239		
		e la partecessaria	Ambient	Condition			
Temperatu	ure, Ta (K)	296.9	Pressure, P			763.6	
		0,46	ion Tunnefay St	andard Inforn			
Equipm	ent No.:	A-04-05	Slope, mc	0.0592	Intercep	t. bc	-0.0283
	Last Calibration Date:26-Dec-12mc x Qstd + bc = $[\Delta H x (Pa/760)]$						
	ration Date:	25-Dec-13			x (Pa/760) x (298		
			0.211	erop o l			
		Orfic		f TSP Sampler		HVS	<u>en</u> te por el sinere de elle T
Calibration Point	ΔH (orifice), in. of water	[ΔH x (Pa/760)		Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/76	50) x (298/Ta)] ^{1/2} Y axis
1	11.3	3.3	8	57.50	7.5		2.75
2	9.8	3.1	4	53,58	6.1		2.48
3	7.6	2.7	7	47.24	4.9		2.22
4	5.2	2.2	9	39.16	3.2		1.80
5	3.3	1.8	2	31.29	2.0		1.42
Slope , mw =	ression of Y on X 	- 0.998		Intercept, bw	-0.140	53	
*If Correlation (Coefficient < 0.99	0, check and recalib	orate.	-			
			Set Point (Calculation			
From the TSP F	ield Calibration C	urve, take Qstd = 4	3 CFM				
From the Regree	ssion Equation, th	e "Y" value accordi	ng to				
		mw x Ost	$d + bw = I\Delta W$	x (Pa/760) x (2	298/Ta)11/2		
			-				
Therefore, S	et Point; $W = (m $	w x Qstd + bw $)^2$ x	(760 / Pa) x (Ta / 298) =	3.95		
					-		
Remarks:							
			L				1 1 .
Conducted by:	WK Jang	Signature:	Kw	in 1		Date:	23/10/13

Checked by:

Signature:



-

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	n i sana baran Alisa da baran	an an an Aragi Subar An an Aragi Argi Subar		
Temperatu	ure, Ta (K)	288	Pressure, Pa			767.5	-	
F				<u> </u>	· · ·			
		Ori	fice Transfer St	andard Inform	ation			
Equipm	ent No.:	A-04-05	Slope, mc	0.0592	Intercep	t, bc	-0.0283	
Last Calibr	ration Date:	26-Dec-12	Dec-12 mc x Qstd + bc = $[\Delta H x (Pa/760) x (298/Ta)]^{1/2}$)] ^{1/2}	
Next Calib	ration Date:	25-Dec-13		Qstd = { $[\Delta H x (Pa/760) x (298/Ta)]^{1/2}$ -bc} / mc				
			Calibration of	TSP Sampler				
Calibration	<u></u>	Orf	ice	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/7	60) 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			Intercept, bw	-0.140	8		
Correlation (coefficient* =	0.99	196	_				
*If Correlation	Coefficient < 0.99	0, check and recal	ibrate.	_				
altere Baren karende eta								
- 29 20 20 20 20 20 20 20 20 20 20 20 20 20				Calculation		un di di pinjuj.		
		Curve, take Qstd =						
From the Regre	ssion Equation, th	e "Y" value accord	ding to					
		mw x O	std + bw = $[\Delta W]$	x (Pa/760) x (2	(98/Ta)1 ^{1/2}			
			t	() (-				
Therefore, S	Set Point; W = (m	$(w x Qstd + bw)^2$	x (760 / Pa) x (Ta / 298) =	3.84			
Remarks:								
)				
a 1	1.7.		k	.		Deter	[n], [n]	
Conducted by: Checked by		Signature:	<u>/</u> (1.	init		Date:	19/12/12 19 December 2.	

19 December 2013



						File No.	MA0010/35/00	153
Station	CAM3 - Talcon	Industrial Ltd		Operator:	WК			
Date:	23-Oct-13			Next Due Date:	22-Dec	-13		
Equipment No.:	A-01-35			Serial No.	0810			
			Ambient	Condition				•••••
Temperatu	ire, Ta (K)	296.6	Pressure, Pa	a (mmHg)		764		
		0	ifice Transfer St	andard Inform	nation			
Equipment No.:		A-04-05	Slope, mc	0.0592	Intercep	·	-0.0283	
Last Calibr	ation Date:	26-Dec-12			bc = [ΔH x (Pa/76			
Next Calibr	ation Date:	25-Dec-13		Qstd = $\{[\Delta H]$	x (Pa/760) x (298	$/Ta)]^{1/2} -be} /$	me	
		•	1		·			
			Calibration of	TSP Sampler				
Calibration		Or	fice	·r		HVS		
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	0) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/76	60) x (298/Ta)] ^{1/2} axis	Y-
1	12.5	3	.55	60.50	7.8		2.81	
2	9.8	3	.15	53.62	6.0		2.46	
3	8.3	2	.90	49.39	5.1		2.27	
4	5.2	2		39.19	3.3		1.83	
5	3.0	1	74	29.88	1.9		1.39	
By Linear Reg	ession of Y on X							
Slope, mw =	0.0459			Intercept, bw -	0.014	4		
Correlation c	oefficient* =	- 0.9	997	• /	••••••••••••••••••••••••••••••••••••••			
*If Correlation (Coefficient < 0.99	0, check and reca	librate.	-				
			Set Point C	Calculation				
From the TSP Fi	eld Calibration C	urve, take Qstd =	= 43 CFM					
From the Regres	sion Equation, the	e "Y" value accor	ding to					
		mw x Ç	lstd + bw ≕ [ΔW	x (Pa/760) x (2	98/Ta)] ⁵²			
Therefore, Se	et Point: W = (m	w x Ostd + bw $)^{2}$	x (760 / Pa) x (7	Γa / 298) =	3.91			
	,	(,						
Remarks:								

Conducted by: $\underline{UK} \underline{7au_{2}}$ Signature: \underline{Kucw} Date: $\underline{23|10|2013}$ Checked by: $\underline{12}$ Signature: $\underline{23|10|2013}$ Date: $\underline{23000ber 0c}$



File No. MA0010/35/0054

							MA0010/35/0054
Station	CAM3 - Talcon	Industrial Ltd			WK		
Date:	19-Dec-13				18-Feb-14		•
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	
			t <u>.</u>		· · · · · · · · · · · · · · · · · · ·		
		01	ifice Transfer St	andard Inform	ation		
Equipm	ent No.:	A-04-05	Slope, me	0.0592	Intercep		-0.0283
Last Calibr	ation Date:	26-Dec-12			$td + bc = [\Delta H \times (Pa/760) \times (298/1)]$		
Next Calibr	ation Date:	25-Dec-13		Qstd ⊨ {[∆H :	x (Pa/760) x (298	/Ta)] ^{1/2} -bc}	/ mc
		•					
	1		Calibration of	TSP Sampler			
Calibration		Or	fice	·····		HVS	1.12
Point	∆H (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	12.4	1	3.60		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	urve, take Qstd =	= 43 CFM				
From the Regres	ssion Equation, th	e "Y" value acco	rding to				
		mw x ($Qstd + bw = [\Delta W]$	x (Pa/760) x (2	98/1a)]***		
Therefore, S	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (Ta / 298) =	3.73		
Remarks:							
romains.							

Checked by: Checked by: Ch	Conducted by: <u>Lick Tang</u> Checked by: <u>(+-</u>)		hwai	Date: Date:	19/12/13 19 December 201
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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	a	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 0.9830	0.6896 0.9683 1.0847 1.1334 1.3652	0.8851 1.2517 1.3995 1.4678 1.7702
Qstd slop intercept coefficie y axis =	t (b) = ent (r) =	2.09107 -0.02838 0.99996 Pa/760) (298/2	[a)]	Qa slop intercep coefficio y axis =	t (b) =	1.30939 -0.01775 0.99996 Ca/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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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 REPORTAPPLICANT:Cinotech Consultants Limited
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong KongTest 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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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

Contract No. DC/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B
Impact Air Quality and Noise Monitoring Schedule for December 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec
	1 hr TSP	1 hr TSP		1 hr TSP Noise	24 hr TSP	
8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
	1 hr TSP Noise	1 hr TSP			1 hr TSP	
				24 hr TSP (CAM1)	24 hr TSP (CAM2 & CAM3)	
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
	1 hr TSP Noise	1 hr TSP		1 hr TSP		
			24 hr TSP			
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
	1 hr TSP Noise	1 hr TSP			1 hr TSP	
		24 hr TSP				
29-Dec	30-Dec	31-Dec				
	1 hr TSP	1 hr TSP Noise				
	24 hr TSP					

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 January 2014

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	
	10150				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-Jar
		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		

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)
2-Dec-13	13:00	Sunny	294.1	767.1	3.7747	3.7821	0.0074	22173.1	22174.1	1.0	1.23	1.23	1.23	73.8	100
3-Dec-13	09:00	Sunny	291.4	768.2	3.7811	3.7882	0.0071	22174.1	22175.1	1.0	1.24	1.24	1.24	74.2	96
5-Dec-13	09:00	Sunny	288.3	767.6	3.7526	3.7647	0.0121	22175.1	22176.1	1.0	1.24	1.24	1.24	74.5	162
9-Dec-13	11:00	Sunny	293.7	763.1	3.7698	3.7751	0.0053	22200.1	22201.1	1.0	1.23	1.23	1.23	73.6	72
10-Dec-13	09:00	Sunny	290.3	764.9	3.7454	3.7490	0.0036	22201.1	22202.1	1.0	1.24	1.24	1.24	74.1	49
13-Dec-13	14:00	Sunny	292.3	764.8	3.6093	3.6171	0.0078	22226.1	22227.1	1.0	1.23	1.23	1.23	73.9	106
16-Dec-13	14:00	Sunny	284.1	764.3	3.6011	3.6098	0.0087	22227.1	22228.1	1.0	1.25	1.25	1.25	74.9	116
17-Dec-13	09:00	Cloudy	284.3	765.4	3.6092	3.6167	0.0075	22228.1	22229.1	1.0	1.25	1.25	1.25	74.9	100
19-Dec-13	11:00	Sunny	284.3	769.9	3.6540	3.6622	0.0082	22253.1	22254.1	1.0	1.25	1.25	1.25	75.1	109
23-Dec-13	09:00	Sunny	284.3	770.7	3.6229	3.6355	0.0126	22254.1	22255.1	1.0	1.23	1.23	1.23	73.6	171
24-Dec-13	09:00	Sunny	284.9	771.5	3.5728	3.5835	0.0107	22255.1	22256.1	1.0	1.23	1.23	1.23	73.6	145
27-Dec-13	10:00	Sunny	285.1	771.8	3.6300	3.6425	0.0125	22280.1	22281.1	1.0	1.23	1.23	1.23	73.6	170
30-Dec-13	09:00	Sunny	283.3	771.2	3.6471	3.6552	0.0081	22281.1	22282.1	1.0	1.23	1.23	1.23	73.8	110
31-Dec-13	14:00	Sunny	292.1	766.8	3.6549	3.6641	0.0092	22306.1	22307.1	1.0	1.21	1.21	1.21	72.5	127
														Min	49
														Mox	474

Max 171 Average 117

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)
2-Dec-13	13:00	Sunny	294.1	767.1	3.6373	3.6454	0.0081	29348.3	29349.3	1.0	1.23	1.23	1.23	74.0	110
3-Dec-13	09:00	Sunny	291.4	768.2	3.7488	3.7574	0.0086	29349.3	29350.3	1.0	1.24	1.24	1.24	74.3	116
5-Dec-13	11:00	Sunny	292.4	767.4	3.6710	3.6868	0.0158	29350.3	29351.3	1.0	1.24	1.24	1.24	74.2	213
9-Dec-13	14:00	Sunny	298.7	761.2	3.6448	3.6521	0.0073	29375.3	29376.3	1.0	1.22	1.22	1.22	73.2	100
10-Dec-13	09:00	Sunny	290.3	764.9	3.6638	3.6706	0.0068	29376.3	29377.3	1.0	1.24	1.24	1.24	74.3	92
13-Dec-13	16:30	Cloudy	292.3	764.4	3.5666	3.5718	0.0052	29377.3	29378.3	1.0	1.23	1.23	1.23	74.0	70
16-Dec-13	14:00	Sunny	284.1	764.3	3.5819	3.5933	0.0114	29402.3	29403.3	1.0	1.25	1.25	1.25	75.0	152
17-Dec-13	09:00	Cloudy	284.3	765.4	3.6237	3.6320	0.0083	29403.3	29404.3	1.0	1.25	1.25	1.25	75.1	111
19-Dec-13	11:00	Sunny	284.3	769.9	3.6470	3.6541	0.0071	29428.3	29429.3	1.0	1.25	1.25	1.25	75.3	94
23-Dec-13	09:00	Sunny	284.3	770.7	3.6362	3.6496	0.0134	29429.3	29430.3	1.0	1.22	1.22	1.22	73.3	183
24-Dec-13	09:00	Sunny	284.9	771.5	3.6150	3.6294	0.0144	29430.3	29431.3	1.0	1.22	1.22	1.22	73.3	196
27-Dec-13	15:00	Sunny	288.5	768.4	3.7192	3.7328	0.0136	29455.3	29456.3	1.0	1.21	1.21	1.21	72.7	187
30-Dec-13	09:00	Sunny	283.3	771.2	3.6062	3.6169	0.0107	29456.3	29457.3	1.0	1.22	1.22	1.22	73.5	146
31-Dec-13	16:00	Cloudy	291.7	766.2	3.7420	3.7528	0.0108	29481.3	29482.3	1.0	1.20	1.20	1.20	72.3	149
														Min	70

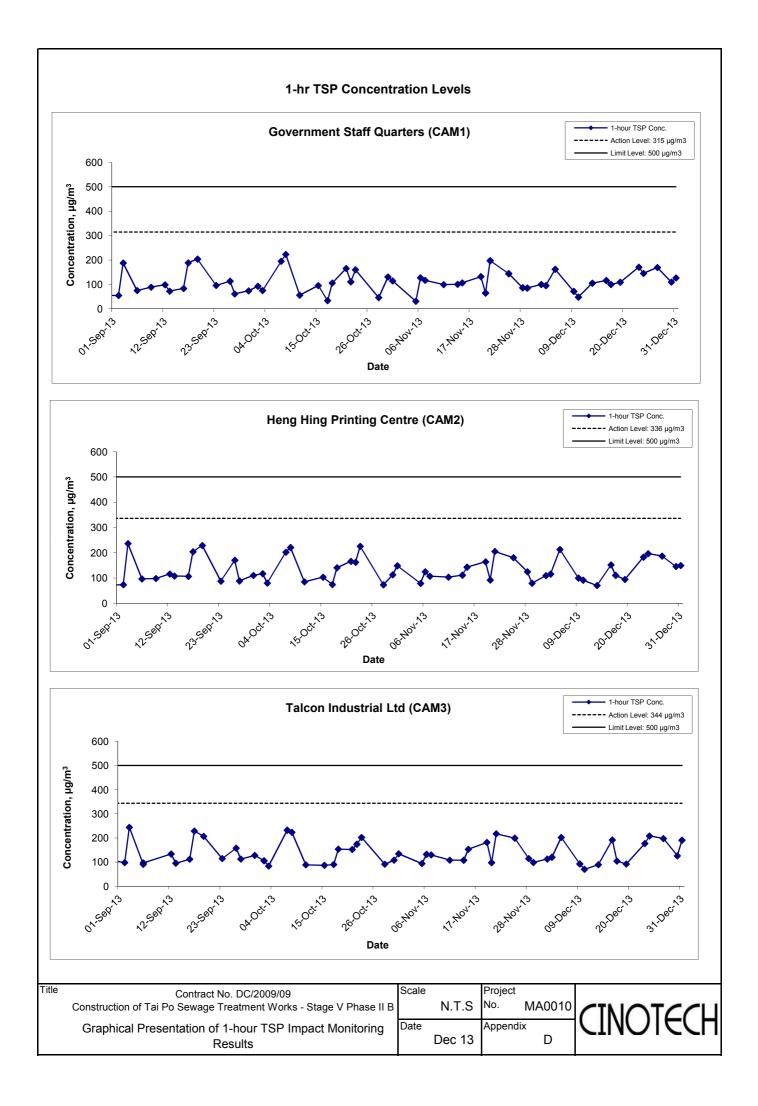
Appendix D - 1-hour TSP Monitoring Results

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)
2-Dec-13	13:00	Sunny	294.1	767.1	3.6147	3.6230	0.0083	22582.9	22583.9	1.0	1.22	1.22	1.22	73.3	113
3-Dec-13	09:00	Sunny	291.4	768.2	3.7453	3.7542	0.0089	22583.9	22584.9	1.0	1.23	1.23	1.23	73.7	121
5-Dec-13	11:00	Sunny	292.4	767.4	3.6451	3.6600	0.0149	22584.9	22585.9	1.0	1.23	1.23	1.23	73.6	203
9-Dec-13	14:00	Sunny	293.7	763.1	3.6544	3.6612	0.0068	22609.9	22610.9	1.0	1.22	1.22	1.22	73.2	93
10-Dec-13	09:00	Sunny	290.3	764.9	3.6773	3.6825	0.0052	22610.9	22611.9	1.0	1.23	1.23	1.23	73.7	71
13-Dec-13	16:00	Cloudy	292.3	764.4	3.5788	3.5854	0.0066	22611.9	22612.9	1.0	1.22	1.22	1.22	73.4	90
16-Dec-13	14:00	Sunny	284.1	764.3	3.5989	3.6132	0.0143	22636.9	22637.9	1.0	1.24	1.24	1.24	74.5	192
17-Dec-13	09:00	Cloudy	284.3	765.4	3.5976	3.6054	0.0078	22637.9	22638.9	1.0	1.24	1.24	1.24	74.5	105
19-Dec-13	11:00	Sunny	284.3	769.9	3.6566	3.6635	0.0069	22662.9	22663.9	1.0	1.25	1.25	1.25	74.7	92
23-Dec-13	09:00	Sunny	284.3	770.7	3.6124	3.6254	0.0130	22663.9	22664.9	1.0	1.22	1.22	1.22	73.4	177
24-Dec-13	09:00	Sunny	284.9	771.5	3.6040	3.6193	0.0153	22664.9	22665.9	1.0	1.22	1.22	1.22	73.3	209
27-Dec-13	15:00	Sunny	288.5	768.4	3.7004	3.7148	0.0144	22689.9	22690.9	1.0	1.21	1.21	1.21	72.8	198
30-Dec-13	09:00	Sunny	283.3	771.2	3.5844	3.5937	0.0093	22690.9	22691.9	1.0	1.23	1.23	1.23	73.5	126
31-Dec-13	16:00	Cloudy	291.7	766.2	3.7451	3.7589	0.0138	22715.9	22716.9	1.0	1.21	1.20	1.20	72.3	191
														Min	71

Min71Max209Average141



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	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)
6-Dec-13	Sunny	289.5	766.6	3.7740	4.0158	0.2418	22176.1	22200.1	24.0	1.24	1.24	1.24	1783.6	136
12-Dec-13	Sunny	289.1	766.6	3.6488	3.7553	0.1065	22202.1	22226.1	24.0	1.24	1.24	1.24	1784.9	60
18-Dec-13	Sunny	283.1	767.5	3.6355	3.7202	0.0847	22229.1	22253.1	24.0	1.25	1.25	1.25	1804.0	47
24-Dec-13	Sunny	285.7	771.2	3.5987	3.7316	0.1329	22256.1	22280.1	24.0	1.23	1.22	1.22	1764.0	75
30-Dec-13	Sunny	283.8	770.7	3.6470	3.7686	0.1216	22282.1	22306.1	24.0	1.23	1.23	1.23	1768.9	69
													Min	47
													Max	136
													Average	77

Station CAM2 Heng Hing Printing Centre

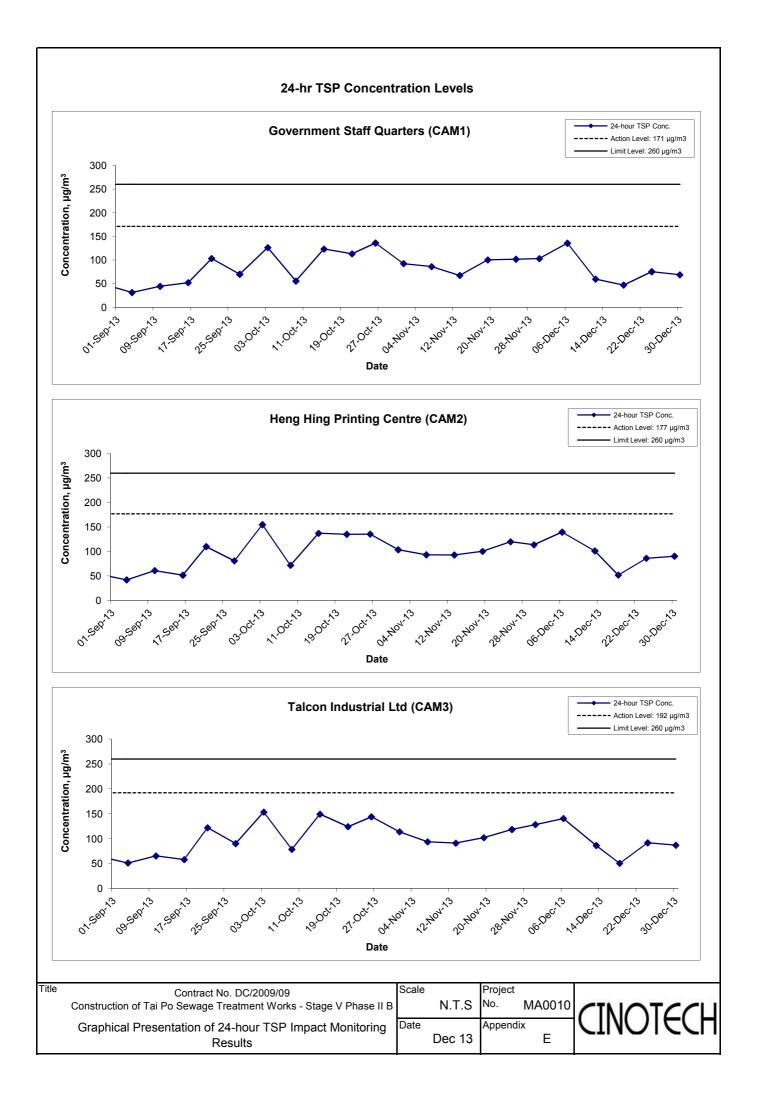
Start Date	Weather	Air	Atmospheric	Filter W	eight (g)	Particulate	Elaps	e Time	Sampling	Flow Rate	e (m ³ /min.)	Av. flow	Total vol.	Conc.
Start Date	Condition	Temp. (K)	Pressure (Pa)	Initial	Final	weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m ³ /min)	(m ³)	(µg/m ³)
6-Dec-13	Sunny	289.5	766.6	3.6371	3.8865	0.2494	29351.3	29375.3	24.0	1.24	1.24	1.24	1787.3	140
13-Dec-13	Cloudy	292.5	764.2	3.5968	3.7764	0.1796	29378.3	29402.3	24.0	1.23	1.23	1.23	1776.4	101
18-Dec-13	Sunny	283.1	767.5	3.5968	3.6904	0.0936	29404.3	29428.3	24.0	1.26	1.25	1.25	1807.1	52
24-Dec-13	Sunny	290.9	768.3	3.7147	3.8644	0.1497	29431.3	29455.3	24.0	1.21	1.21	1.21	1738.5	86
30-Dec-13	Sunny	290.1	768.1	3.7366	3.8938	0.1572	29457.3	29481.3	24.0	1.21	1.21	1.21	1740.5	90
													Min	52
													Max	140
													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)
6-Dec-13	Sunny	289.5	766.6	3.6293	3.8784	0.2491	22585.9	22609.9	24.0	1.23	1.23	1.23	1773.8	140
13-Dec-13	Cloudy	292.5	764.2	3.6134	3.7654	0.1520	22612.9	22636.9	24.0	1.22	1.22	1.22	1762.0	86
18-Dec-13	Sunny	283.1	767.5	3.6332	3.7236	0.0904	22638.9	22662.9	24.0	1.25	1.25	1.25	1795.0	50
24-Dec-13	Sunny	290.9	768.3	3.7138	3.8731	0.1593	22665.9	22689.9	24.0	1.21	1.21	1.21	1739.4	92
30-Dec-13	Sunny	290.1	768.1	3.7393	3.8905	0.1512	22691.9	22715.9	24.0	1.21	1.21	1.21	1741.4	87
-						-	-			-		-	Min	50
													Max	140

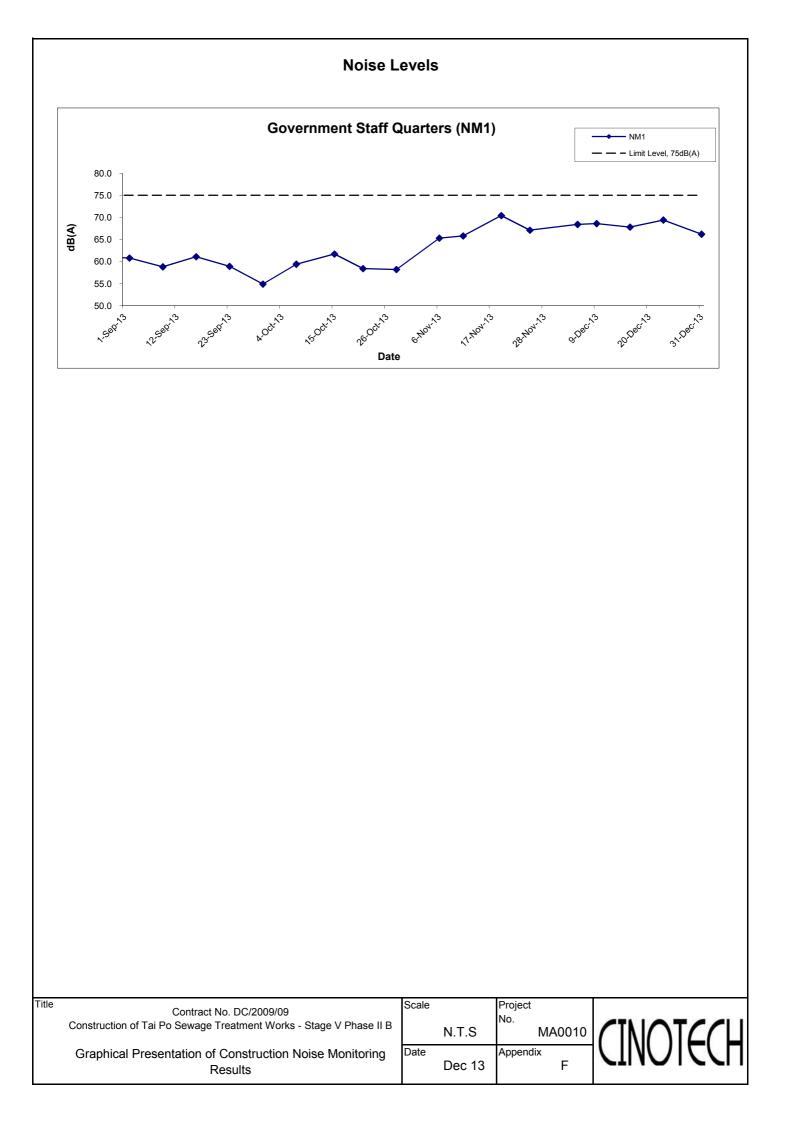
Average 91



APPENDIX F NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATION

Appendix F - Noise Monitoring Results

Location NM1	- Governme	ent Staff Quart	ters		
Dete	Time	M/a oth ar	dE	8 (A) (30-min))
Date	Time	Weather	L _{eq}	L ₁₀	L ₉₀
5-Dec-13	09:30	Sunny	68.4	70.6	65.5
9-Dec-13	11:15	Sunny	68.6	70.1	64.7
16-Dec-13	15:25	Sunny	67.8	69.2	65.6
23-Dec-13	09:15	Sunny	69.4	71.1	64.8
31-Dec-13	13:45	Sunny	66.2	68.1	62.9
		Average	68.2	69.8	64.7
		Minimum	66.2	68.1	62.9
		Maximum	69.4	71.1	65.6



APPENDIX G SUMMARY OF EXCEEDANCE

APPENIDX G – SUMMARY OF EXCEEDANCE

- **Reporting Month:** December 2013
- 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

Inspection	Information

Checklist Reference Number	131206	
Date	6 December 2013 (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	
131206-R01	• Ponding water should be cleared from near FC9B and FC11B.	B12
	Part C - Air Quality	
131206-R02	• Dusty stockpile should be covered by impervious material or removed to prevent muddy water and dust generation.	C7
	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. 	
	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.:131129), all environmental deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	the	9 December 2013
Checked by	Dr. Priscilla Choy	WIL	9 December 2013

Inspection Information

Checklist Reference Number	131213	
Date	13 December 2013 (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	
131213-R01	• Silt and muddy water in wheel washing bay should be cleared.	B14iii & B14i
	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.:131206), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	-the-	16 December 2013
Checked by	Dr. Priscilla Choy	NFT	16 December 2013

Inspection Information

Checklist Reference Number	131220	
Date	20 December 2013 (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	
131220-001	• Muddy water was observed going to the drainage system directly. The contractor was reminded to treat the water with sedimentation tank before discharge. Also, sandbags should be used to surround the drainage system.	B5i & B7
	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. 	
	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.:131213), all environmental deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	Ass	24 December 2013
Checked by	Dr. Priscilla Choy	NT.	24 December 2013

Inspection Information

Checklist Reference Number 131227		·······
Date	27 December 2013 (Friday)	
Time	10:00-11:00	

Ref. No.	Non-Compliance	Related Item
	None identified	<u>No.</u>

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. 	
	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.:131220), all environmental	
	deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Edmond Put	Ma	30 December 2013
Checked by	Dr. Priscilla Choy	NF	30 December 2013

APPENDIX I EVENT ACTION PLANS

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

EVENT		ACTION										
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						
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.	~

Type of Impact	Recommended Mitigation Measures						
	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.: <u>DC/2009/09</u>

(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 Mat	erials 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	1.031	0	0	0	1.031	0	0.8	0	0	0	0.01
Feb	2.255	0	0	0	2.255	0	0	0	.0	0	0.01
Mar	1.620	0	0	0	1.620	0	0	0	0	0	0.01
Apr	0.004	0	0	0	0.004	0	0	0	0	0	0.01
May	0	0	0	0	0	0	0	0	0	0	0.02
June	0	0	0	0	0	0	0	0	0	0	0.01
Sub-total	4.910	0	0	0	4.910	0	0.8	0	0	0	0.07
July	0	0	0	0	0	0	0	0	0	0.03	0.01
Aug	0	0	0	0	0	0	0	0	0	0	0.01
Sept	0	0	0	0	0	0	0.1	0	0	0	0.01
Oct	0.003	0	0	0	0.003	0	0.1	0	0	0	0.01
Nov	0	0	0	0	0	0	0.1	0.01	0	0	0.01
Dec	0.008	0	0	0	0.008	0.1	0	0	0	0	0.01
Total	4.921	0	0	0	4.921	0.1	1.1	0.01	0	0.03	0.13

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: December 2013

Log Ref.	Location	LocationReceived DateDetails of Complaint		Investigation/Mitigation Action	Status
N/A	N/A	N/A	N/A	N/A	N/A

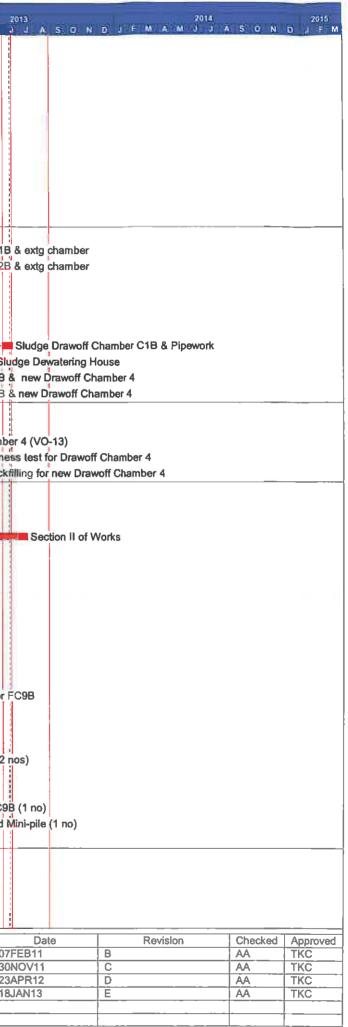
Remarks: No environmental complaint was received in the reporting month.

APPENDIX M CONSTRUCTION PROGRAMME

Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010. FMAMJJASONDJFMAMJJASONDJFMAMJJASOND.	J E M V	20 N M J
General	- the							
1000	Possession of Site	0		28JAN10	1	Possession of Site		
10000	Completion of Section I of Works (365+12d)	0		09FEB11		♦ Completion of Section I of Works (365+12d)		
20000	Completion of Section II of Works (460d)	0		24DEC12			Completion	1 of Sec
30000	Completion of Section III of Works (670+11d)	0		13MAR12		Sompletion of Section III of Wor	ks (670+1	1d)
40000	Completion of Section IV of Works (365+14d)	0		11FEB11		 Completion of Section IV of Works (365+14d) 		
50000	Completion of Section V of Works (1185d)	0		27APR13				Com
60000	T&C for FC11B & FC12B by E&MP	60	150CT12	10JAN13			T&C for F	
60010	Notice on Suspension of Aeration Tank No. 4	10	18JAN13	27JAN13	-595d		Notice o	on Susp
60020	Notice on Suspension of Extg Chlorination House	10	18FEB13	27FEB13	-1d		Notic	ce on S
60030	Notice on Suspension of Gas Holder Tank No. 2	10	18FEB13	27FEB13	-1d		Notic	ce on S
60040	Takeover of Bio-gas Holding Tank Support Area	10	01MAY13	10MAY13	-58d			Tak
60050	Notice on Functioning of FC7B - FC12B	10	15JUN13	24JUN13	-528d			
60060	Notice on Suspension of Aeration Tank No. 1-3	10	13SEP13	22SEP13	-618d		1	
1010	Site Clearance	20	20 (4)(40	0755040		Site Classes		1
1010			29JAN10			Site Clearance		1
	Contractor Site Office Set-up		07APR10		-			
1030	Engineer's Accommodation			02JUN10		Engineer's Accommodation		
1040 1050	Initial Survey Condition Survey			29MAR10		Condition Survey		
_				14JUN10		Environmental Baseline Monitoring		
1060 1070	Environmental Baseline Monitoring Replacing Floor Tile for Engineer's Accomodation		09APR10			Replacing Floor Tile for Engineer's Accomodation		
1070	Replacing Floor the for Engineer's Accomodation	30	03AUG10	0700110	-			
2010	Engineer's Green Roof	60	10MAY10	17SEP10		Engineer's Green Roof		
2020	Excavation and Lateral Support (ELS)		15MAY10			Excavation and Lateral Support (ELS)		
2030	Project Signboard (DELETED)		28DEC10			Project Signboard (DELETED)		
2040	Pile Load Test Set-up			20NOV10		Pile Load Test Set-up		
2050	Falsewk & Fwk for Pile Cap		03JUN10	19JUL10		Falsewk & Fwk for Pile Cap		
2060	Falsewk & Fwk for Wall Structure	30	18JUN10	19JUL10		Falsewk & Fwk for Wall Structure		
2070	Falsewk & Fwk for Top Slab	30	03JUL10	19JUL10		Falsewk & Fwk for Top Slab		
2080	Multi-part Cover	45	28JUN11	10APR12		Multi-part Cover		
2090	FRP Handrall, Stair & Floor	45	09JUN11	11JAN12		FRP Handrail, Stair & Floor	3 1 1	
2100	FRP Cover	30	09JUN11	11JAN12		FRP Cover		
2120	Green Roof System at Sludge Dewatering House	60	28MAY10	270CT11		► Green Roof System at Sludge Dewatering House	se	
2130	Green Roof System al Transformer House	60	28MAY10	270CT11		Green Roof System at Transformer House		
0040								
3010	Casing for Mini-pile Casing for Replaced Socketted H-pile		15MAY10	the second se	_	Casing for Mini-pile		1
3020			15MAY10			Casing for Keplaced Socketted H-pile		
3030 3040	Steel Member for Socketted H-pile DI Water Pipe Puddle & Tee		28FEB10 28MAY10			Steel Member for Socketted H-pile		
	DI Water Pipeline					Di Water Pineline		
	Steel Member for Shelter		28MAY10 29JUL10			DI Water Pipeline Steel Member for Shelter		
Section I o		00	200010	23140710				
CHIIIIKS V	Auto I							1
10001	Section I of Work (Substantial Completion)	365	29JAN10	25MAY11		Section I of Work (Substantial Completion)		
	Pre-drilling Works (18 nos)		10MAR10			Pre-drilling Works (18 nos)		
	Preliminary Pile	the second se	21SEP10			Preliminary Pile		
	Load Test for Preliminary Pile		210CT10			Load Test for Preliminary Pile		
	Alternative Proposed Mini-piling (56 nos)			08NOV10		Alternative Proposed Mini-piling (56 nos)		
	Proof Drilling (4 nos)		01NOV10			Proof Drilling (4 nos)		
-	Load Test for Main Pile (1 no)	_	26NOV10			Load Test for Main Pile (1 no)		
The Ca	The Mar Fallin & Fallin							
10110	Excavation for FC11B	15	15DEC10	29JAN11	1	Excavation for FC11B	i t	
	Pile Head Construction for FC11B	_	12JAN11			Pile Head Construction for FC11B		
	Base Slab of FC11B	_	11FEB11			Base Slab of FC11B		
Start date	29JAN10 Early bar							1
Finish date	25DEC13							07F
Data date	18JAN13					TPSTW Stage 5 Phase 2B		30N
Run date Page numb	20JAN13 Summary bar					-		23A 18J
	era Systems, Inc. Start milestone point					Master Program		
-=(+)	 Finish milestone point 							

2013		2014 - M J J A	5 0 N	2015 D J F M						
Section II of Works (460d)									
ompletion of Section	ı V of Works (1	185d)								
B & FC12B by E&M										
spension of Aeratic										
Suspension of Ext										
akeover of Bio-gas										
Notice on Funct										
	on Suspension	of Aeration 1	Tank No. 1-	3						
9										
3 4 1 1										
5 1 3										
8 8 8										
2 2 2										
1										
2 1 1										
4 8 8										
8 3 3										
3 8 8										
8 8 8										
6 6 7										
1										
Date)7FEB11	Revi B	sion	Checked	Approved						
30NOV11	C		AA AA	TKC TKC						
23APR12	<u>D</u>		AA	TKC						
IBJAN13	E		AA	TKC						

Act ID	Description	Orig Early Dur Start	Early Finish	Total Float	2010 2011 2012 2012 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 M J J A S O N D J F M A M J
10140	Structural Wall for FC11B		15APR11		Structural Wall for FC11B
10150	Watertightness Test for FC11B		19MAY11		Watertightness Test for FC11B
10160	Concrete Coating for FC11B		29AUG11		Concrete Coating for FC11B
10170	Backfilling for FC11B (Stage I)	20 20MAY11	15AUG11		Backfilling for FC11B (Stage I)
10180	Excavation for 12B	15 13JAN11	15MAR11		Excavation for 12B
10190	Pile Head Construction for FC12B	15 22FEB11	16MAR11		Pile Head Construction for FC12B
10200	Base Slab of FC12B	20 12MAR11	30MAR11		Base Slab of FC12B
10210	Structural Wall for FC12B	20 01APR11	25MAY11		Structural Wall for FC12B
10220	Watertightness Test for FC12B	20 03JUN11	15JUN11		Watertightness Test for FC12B
10230	Concrete Coating for FC12B	7 22AUG11	29AUG11		Concrete Coating for FC12B
10240	Backfilling for FC12B (Slage 1)	20 20JUN11	15AUG11		Backfilling for FC12B (Stage 1)
10250	Pillar Box for FC11B & FC12B	30 20JUL11	13AUG11		Pillar Box for FC11B & FC12B
(Common	Make				
11010	DN700 DI Pipe % FC11B & extg chamber	50 17SEP12	170CT12		DN700 DI Pipe % FC11B
11020	DN700 DI Pipe % FC12B & extg chamber	50 17SEP12	170CT12		DN700 DI Pipe % FC12B
11030	Sludge Drawoff Chamber C2B~C3B & Pipework	30 13JUL10	28SEP10		Sludge Drawoff Chamber C2B-C3B & Pipework
11040	Sealing extg M/H E9 for sewer diversion	10 15FEB11	24FEB11		Sealing extg W/H E9 for sewer diversion
11050	Removal of extg DN900 conc. pipe	20 25FEB11	07JUN11		Removal of extg DN900 conc. pipe
11060	Removal of extg DN525 conc. pipe	20 29APR11	04MAY11		Removal of extg DN525 conc. plpe
11070	Sludge Drawoff Chamber C1B & Pipework	20 28MAY13	16JUN13	-493d	
11080	Cable Ducting at Sludge Dewatering House	150 12MAY12	01DEC12		► Cable Ducting at Slu
11090	DN500 DI Pipe % FC11B & new Drawoff Chamber 4	30 10JAN12	05OCT12		DN500 DI Pipe % FC11B 8
11100	DN500 DI Pipe % FC12B & new Drawoff Chamber 4	30 10JAN12	050CT12		DN500 DI Pipe % FC12B 8
9.00000000	Omm				
12010	Demolition of extg Drawoff Chamber 4 (VO-13)	20 08DEC11	22DEC11		Demolition of extg Drawoff Chamber 4 (VO-13)
12020	Construction of new Drawoff Chamber 4 (VO-13)	90 23DEC11	03JUL12		Construction of new Drawoff Chambe
12025	Water-tightness test for Drawoff Chamber 4	14 18JAN13	31JAN13	86d	Water-tightnes
12030	Backfilling for new Drawoff Chamber 4	30 19MAR13	17APR13	-433d	Backf
Section II (20001	of Works Notification from Engineer	90 22SEP11	22SEP11		► Notification from Engineer
	Section II of Works		15JUL13	-203d	
20020	Removal of extg Final Settlement Tank No. 7		10JAN11	2000	Removal of extg Final Settlement Tank No. 7
	Removal of extg Final Settlement Tank No. 10	90 14DEC10			Removal of extg Final Settlement Tank No. 10
	Pre-drilling Works for FC78, 6B & 10B (27 nos)	45 12APR11		-	Pre-drilling Works for FC7B, 8B & 10B (27 nos)
	Removal of extg Final Settlement Tank No. 8	90 21FEB11			Removal of extg Final Settlement Tank No. 8
	Clearing extg Final Settlement Tank No. 9	7 120CT11			Clearing extg Final Settlement Tank No. 9
	Removal of extg Final Settlement Tank No. 9	90 14OCT11			Removal of extg Final Settlement Tank No. 9
20080	Pre-drilling Works for FC9B (9 nos)	45 20JAN12			Pre-drilling Works for FC9B (9 nos)
20090	Alternative Proposed Mini-plles for FC8B & FC10B	75 07JUN11			Alternative Proposed Mini-piles for FC8B & FC10B
20100	Alternative Proposed Minl-piles for FC7B	40 25NOV11			Alternative Proposed Mini-piles for FC7B
20110	Alternative Proposed Mini-piles for FC9B	40 16APR12	12JUL12		Alternative Proposed Mini-piles for F
20120	Proof Drilling for FC10B (2 nos)	14 06SEP11	22SEP11		Proof Drilling for FC10B (2 nos)
20130	Proof Drilling for FC8B (2 nos)	20 23NOV11	08DEC11		►■ Proof Drilling for FC8B (2 nos)
20140	Proof Drilling for FC7B (2 nos)	14 21MAR12	04APR12		Proof Drilling for FC7B (2 nos)
20150	Proof Drilling for FC9B (2 nos)	14 03SEP12			Proof Drilling for FC9B (2 n
20160	Load Test for extg Pile at FC8B & FC10B (2 nos)	20 30AUG11			Load Test for extg Pile at FC8B & FC10B (2 nos)
20170	Load Test for extg Pile at FC7B (1 no)	20 27SEP11	040CT11		Load Test for extg Pile at FC7B (1 no)
20180	Load Test for extg Pile at FC9B (1 no)	10 13AUG12	28AUG12		Load Test for extg Pile at FC9E
20190	Load Test for Altern. Proposed Mini-pile (1 no)	10 02AUG12		[]	Load Test for Altern. Proposed N
These Line	Pre-drilling Works for Washout Chamber (1 no)	14 19MAY10	25MAY10		Pre-drilling Works for Washout Chamber (1 no)
21010	Excavation for FC10B	30 27SEP11	15JUN12		► Excavation for FC10B
21020	Pile Head Construction for FC10B	35 01NOV11	03JUL12		Pile Head Construction for FC10B
21030	Base Slab for FC10B	20 05DEC11			Base Slab for FC10B
	Structural Wall for FC10B	30 04AUG12	08SEP12		Structural Wall for FC10B
Start date Finish date Data date Run date Page numb c Primave	29JAN10 Early bar 25DEC13 Progress bar 18JAN13 Critical bar 20JAN13 Summary bar er 2A Start milestone point pra Systems, Inc. Finish milestone point				TPSTW Stage 5 Phase 2B Master Program



Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010 - 2011 - 2012 A 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 M J J A S O N D J F M A
21050	Watertightness Test for FC10B	25	040CT12	120CT12		Watertightness Test
	Concrete Coating for FC10B			18JUN13	-186d	
	Backfilling for FC10B		· · · · · · · · · · · · · · · · · · ·	06NOV12		Backfilling for FC1
	Excavation for FC8B			13APR12		Excavation for FC8B
	Pile Head Construction for FC8B		30JAN12			
_	Base Slab for FC8B		20FEB12			Base Slab for FC8B
	Structural Wall for FC8B			17JUL12		Structural Wall for FC8B
	Watertightness Test for FC8B			07SEP12		Watertightness Test for
	Concrete Coating for FC8B			073EP12 08JUN13	-186d	
	Backfilling for FC8B			06NOV12	-1000	
	Excavation for FC9B					Backfilling for FC
	Pile Head construction for FC9B			24DEC12		Excavation Bile Head a
				24DEC12		
	Base Slab for FC9B		07NOV12			Base Sla Struct
	Structural Wall for FC9B		17JAN13	16FEB13	-433d	
	Watertightness for FC98			13MAR13	-130d	
	Concrete Coating for FC98			29MAY13	-186d	
	Backfilling for FC9B			03MAY13	-130d	
	Excavation for FC7B	30	25JAN13	23FEB13	-221d	
	Pile Head Construction for FC7B	35	24FEB13	30MAR13	-221d	
1240	Base Slab for FC7B	20	31MAR13	19APR13	-221d	
1250	Structural Wall for FC7B	30	20APR13	19MAY13	-221d	
260	Watertightness Test for FC7B	25	20MAY13	13JUN13	-221d	
270	Concrete Coating for FC7B	_	19JUN13		-186d	
280	Backfilling for FC7B			02AUG13		
2002	DN700 DI Pine %EC2P & evic chamber	1 20	2185B42	1000740		DN700 DI Pipe %F
	DN700 DI Pipe %FC8B & exig chamber			100CT12		
	DN700 DI Pipe % FC10B & extg chamber		21SEP12			
	DN700 DI Pipe % FC9B & extg chamber		14MAR13		-130d	
	DN700 DI Pipe % FC78 & extg chamber		14JUN13		-221d	
	DN500 DI Pipe % FC10B & new Drawoff Chamber 4		22SEP12			
	DN500 DI Pipe % FC9B & new Drawoff Chamber 4		17FEB13		-433d	
	DN500 DI Pipe % FC7B & new Drawoff Chamber 3		17JUN13		-234d	
	DN500 DI Pipe % FC8B & new Drawoff Chamber 3		17JUN13		-234d	
	Excavation of Inspection Pit T8		21DEC10			Excavation of Inspection Pit T8
	Sealing DN600 & DN800 Scum Pipes at RAS	10	180CT11	01NOV11		Sealing DN600 & DN800 Scum Pipes at RAS
	Removal of extg 3 nos. of dosing pipes & trench			03MAR12		Removal of extg 3 nos. of dosing pipes & tr
	Removal of DN800 Sludge Pipe for piling	15	01DEC11	08MAR12		Removal of DN800 Sludge Pipe for piling
090	Removal of DN600 Sludge Pipe	30	18JAN13	16FEB13	-585d	
100	Construction of FMC2B	60	20JUN12	08DEC12		Construction
110	Modification of RAS Pumping Station	60	28JAN13	28MAR13	-450d	
	DN1000 DI Sludge Pipe		28JAN13		-595d	
	Backfilling for Sludge Pipe		27FEB13		-81d	Ba
	Construction of FMC1B + removal of DN800 pipe		17NOV11			-> Construction of FMC1B
	Backfilling for FMC1B		29SEP12			Backfilling for FM
mitten (C/AM					
	Pre-drilling for new Drawoff Chamber 3 (1 no)		25JUN11			Pre-drilling for new Drawoff Chamber 3 (1 no)
020 [·]	1st Delimotion of extg Drawoff Chamber 3 (VO13)	20	30NOV11	05DEC11		► 1st Delimotion of extg Drawoff Chamber 3 (VO13)
030	Mini-piling for new Drawoff Chamber 3 (2 nos)	30	05NOV12	29NOV12		Mini-piling for
032	ELS for Drawoff Chamber 3		18JAN13		-493d	
-	2nd Demolition of extg Drawoff Chamber 3 (VO13)		07FEB13		-493d	2nd I
	Construction of new Drawoff Chamber 3 (VO13)		17FEB13		-493d	
	Watertightness Test for Drawoff Chamber 3 (VO13)		28MAY13		-234d	
050 E	Backfilling for new Drawoff Chamber 3 (VO13)			15AUG13	-234d	
	f Works	-				
001	Notification from Engineer	30	02APR10	02APR10		Notification from Engineer
date		30	UZAPRIU			
h date	25DEC13 Progress bar					
date	18JAN13 Citical bas					TPSTW Stage 5 Phase 2B
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ate	20JAN13 Summary bar					-
date numbe	er 3A Summary bar ra Systems, Inc.					Master Program

2013 J J A S O N	D J F M A M J J	A - 5 0 N	2015 D J F M						
FC10B Concrete Coating	for EC10B								
B									
Concrete Coating	for FC8B								
C9B									
FC9B									
Wall for FC9B									
htness for FC9B									
Concrete Coating f	or FC9B								
n for FC9B									
ead Construction fo	r FC7B								
e Slab for FC7B									
Structural Wall for F									
Watertightness To									
Concrete Coatir									
& extg chamber									
3 & extg chamber									
00 DI Pipe % FC9B	& exig chamber e % FC7B & exig chamber								
& new Drawoff Ch	_								
DI Pipe % FC9B &	new Drawoff Chamber 4								
	e % FC7B & new Drawoff C								
DN500 DI Pip	e % FC8B & new Drawoff C	hamber 3							
f DN600 Sludge Pip	e								
AC2B	ning Station								
DI Sludge Pipe									
ng for Sludge Pipe									
noval of DN800 pipe	9								
Drawoff Chamber 3	(2 nos)								
woff Chamber 3									
100	f Chamber 3 (VO13) / Drawoff Chamber 3 (VO13	3)							
Watertightness T	est for Drawoff Chamber 3	(VO13)							
Backfilling	for new Drawoff Chamber 3	(VO13)							
3 3 1 1									
3									
	(Par. 1-1-								
Date 7FEB11	Revision B	AA	Approved TKC						
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3APR12 8JAN13	E	AA AA	TKC TKC						
		1.01							

Act ID	Description			Total Float FMAMJJASONDJEMAMJJASONDJEMAMJJASONDJEMAM	
30010	Section III of Works	670 03MAY10 02D		-640d	Ę
30020	Site Clearance	10 28MAY10 29J	UL10	Site Clearance	
30030	Pre-drilling for PST5, AT5-AT7 (41 nos)	106 26MAY10 020	CT10	► Pre-drilling for PST5, AT5-AT7 (41 nos)	1
30040	Pre-drilling for Mixed Liquor Channel 1 (25 nos)	20 12MAY10 24A	UG10	Pre-drilling for Mixed Liquor Channel 1 (25 nos)	
30050	Pre-drilling for Mixed Liquor Channel 2 (6 nos)	20 04OCT10 150	CT10	Pre-drilling for Mixed Liquor Channel 2 (6 nos)	8
30060	Prelimiary Socketted H-plling	7 18OCT10 230		Prelimiary Socketted H-piling	
30070	Load Test for Preliminary Socketted H-pile	14 18NOV10 27N		Load Test for Preliminary Socketted H-pile	
30080	Socketted H-piling for PST5, AT5-AT7 (174 nos)	263 19OCT10 16M	AR11	Socketted H-piling for PST5, AT5-AT7 (174 nos)	
30090	Proof Drilling for PST5 & AT5-AT7 (4 nos)	14 21MAR11 11A	PR11	Proof Drilling for PST5 & AT5~AT7 (4 nos)	
30100	Load Test for Socketted H-pile (2 nos)	14 18MAR11 31N		Load Test for Socketted H-pile (2 nos)	1
30110	Pre-drilling for Sludge Digestion Tank (7 nos)	18 28AUG10 290		Pre-drilling for Sludge Digestion Tank (7 nos)	
30120	Socketted H-piling for SD Tank (29 nos)		AR11	Socketted H-piling for SD Tank (29 nos)	1
30130	Proof Drilling for Sludge Digestion Tank (2 no)	14 02APR11 03J		Proof Drilling for Sludge Digestion Tank (2 no)	
30140	Load Test for Sludge Digestion Tank (1 no)	7 01APR11 12A		Load Test for Sludge Digestion Tank (1 no)	
30150	Preliminary Mini-pile for Mixed Liquor Channel	7 03NOV10 29N		Preliminary Mini-pile for Mixed Liquor Channel	
30160	Load Test for Preliminary Mini-pile (1 no)	14 03JAN11 10J		Load Test for Preliminary Mini-pile (1 no)	
30170	Mini-piling for Mixed Liquor Channel (43 nos)	200 03NOV10 25J		Minl-piling for Mixed Liquor Channel (43 nos)	
30180	Mini-piling for Mixed Liquor Channel (16 nos)	41 04APR11 07N		Mini-piling for Mixed Liquor Channel (16 nos)	
30190	Mini-piling for MLC (M60–M67)	55 31MAY11 17J		Mini-piling for MLC (M68-M79)	
30200	Mini-piling for MLC (M68-M79)	42 28NOV11 07A		Milliphillig to Mile (was mile)	M
30210	Mini-piling for MLC (M17 & M20) (VO97)	45 04DEC12 11J		Proof Drilling for Milzed Liquor Channel (1 no)	
30220	Proof Drilling for Miixed Liquor Channel (1 no)		JL11		
30230	Remaining Proof Drilling for MLC (1 no)	14 080CT12 170 14 04FEB13 17F			
30235 30240	Proof Drillig for add. 4 piles of MLC (VO97)	14 04FEB13 17F		-341d Proof Drill	1 1
	Load Test for Mixed Liquor Channel (1 no)			Pre-drilling for Bio-gas Holding Tank (3 nos)	1
30250	Pre-drilling for Blo-gas Holding Tank (3 nos)		UG10	Mini-pillng for Bio-gas Holding Tank (4+8 nos)	
30260	Minl-pilling for Blo-gas Holding Tank (4+8 nos)		AR11 AY11	Proof Drilling for Bio-gas Holding Tank (1 no)	
30270	Proof Drilling for Bio-gas Holding Tank (1 no) Load Test for Bio-gas Holding Tank Area (1 no)	14 04APR11 11A		Load Test for Bio-gas Holding Tank Area (1 no)	
50500	Load rest for bio-gas holding rank Alea (Tho)		rixi j		
31000	Excavation for AT5 & AT6 1st pour	30 17MAR11 25M	AY11	Excavation for AT5 & AT6 1st pour	
	Excavation for AT5 & AT6 2nd pour	20 26MAY11 07S		Excavation for AT5 & AT6 2nd pour	
	Pile Head for AT5 & AT6 1st pour (63 nos)	14 16APR11 07J		Pile Head for AT5 & AT6 1st pour (63 nos)	
	Pile Head for AT5 & AT6 2nd pour (45 nos)	53 08JUL11 17S		Pile Head for AT5 & AT6 2nd pour (45 nos)	
	Pile Cap for AT5 & AT6 1st pour	30 08JUL11 03A		Pile Cap for AT5 & AT6 1st pour	
31050	Pile Cap for AT5 & AT6 2nd pour	30 18SEP11 040	i	Pile Cap for AT5 & AT6 2nd pour	
31060	Structural Wall for AT5 & AT6 1st pour (14pours)		EC11	Structural Wall for AT5 & AT6 1st pour (14pours)	
31070	Structural Wall for AT5 & AT6 2nd pour (10pours)		EB12	Structural Wall for AT5 & AT6 2nd pour (10pours)
31080	Watertightness Test for AT5	30 04FEB12 16M	AR12	Watertightness Test for AT5	
31085	Watertightness Test for AT6	30 23APR12 03M	AY12	Watertightness Test for ATC	
31090	Backfilling for AT5	30 03MAR12 10A	PR12	Backfilling for AT5	
31095	Backfilling for AT6	30 30MAY12 02A	UG12	Backfilling for AT6	
31100	Excavation for Effluent Chamber	10 01AUG11 01D	EC11	Excavation for Effluent Chamber	
31110	Pile Head for Effluent Chamber (15 nos)	10 01SEP11 260	CT11	Pile Head for Effluent Chamber (15 nos)	
31120	Pile Cap for Effluent Chamber	20 02DEC11 15D	EC11	Pile Cap for Effluent Chamber	
31130	Structural Wall for Effluent Chamber		AR12	Structural Wall for Effluent Chamber	
31160	Top Slab & Upstand Wall of Effluent Chamber	30 02FEB12 31M		Top Slab & Upstand Wall of Effluent Chamb	er
31170	Watertightness for Effluent Launder	15 19MAY12 13A		L⇒ Watertightness for Effluent La	
31200	Excavation for PST5	20 01AUG11 24A		Excavation for PST5	
31210	Provision of Platform for Add. Load Test (VO56)	15 11APR12 21A		Provision of Platform for Add. Load Jest (
	Add. Load Test for AT7 (VO56)	11 02MAY12 12M		Add. Load Test for AT7 (VO56)	
	Excavation for AT7	15 09JAN12 22J			
	Pile Head for PST5 Pipe Chamber (6 nos)	14 19AUG11 040		Pile Head for PST5 Pipe Chamber up to base soffit	
	Pile Cap for PST5 Pipe Chamber up to base soffit	30 17OCT11 04N		Pile Cap for PST5 Pipe Chamber up to base soffit	
	Plle Head for AT7 (30 nos)	20 01FEB12 12J		Pile Head for PST5 (15 nos)	
	Pile Head for PST5 (15 nos)	28 01FEB12 23A	PR12		
Start date	29JAN10 Early bar			F	07
Finish date	19 JANI12			F	30
Run date	20 JAN13			IPSIW Stage 5 Phase 2D	23
Page num	ber 4A Summary bar				18
c Primav	vera Systems, Inc. Start milestone point Finish milestone point			Master Program	

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		Section III of W	orks		
3					
5 9 8 8					
NLC (M1	7 & M20) (\	√O97)			
for MLC	(1 no)	MLC (VO97)			
	. 4 piles of	WILC (VO97)			
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r Inder 056)					
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7FEB11		В		AA	TKC
0NOV11		С		AA	TKC
0NOV11 3APR12 8JAN13		C D E			

Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010 2011 2012
31250	Pile Cap for AT7	Processory 1	13FEB12	16JUL12	THE REAL PROPERTY IN	M J J A S O N D J F M A M J J A S O N O J F M A M J A S O N D J F M A M
	Pile Cap for PST5		23MAR12			Pile Cap for PST5
260	Structural Wall for PST5 & AT7 (10 pours)			040CT12		
270	Watertightness Test for PST5 & AT7		08SEP12	30NOV12		► Structural Wall for PST5
280	Backfilling for PST5 & AT7	_ +	290CT12	14DEC12		Bayfilling for PS
290	Details of Sludge Digestion Tank No. 3		28FEB12	24APR12		Details of Sturge Digestion Tank No. 3
300	Excavation for Sludge Digestion Tank No. 3 (SDT3)					Details of Sludge Digestion Tank No. 3
-			21MAY12			Excavation for Sludge I
1310	Pile Head Construction for SDT3 (29 nos)		15SEP12	170CT12		
1320	Base Slab for SDT3		30OCT12			Base Slab for SDT3
	Backfilling + Removing Struts for SDT3		22NOV12			
1330	Structural Wall for SDT3		25DEC12		-469d	
1340	Inclined Top Slab for SDT3		01MAR13		-469d	
1350	Watertightness Test for SDT3			04MAY13	-469d	
	Air Tightness Test for SDT3		05MAY13		-469d	
1370	Backfilling for SDT3	13	12MAY13	24MAY13	-437d	
1400	Excavation for MCL Bay 7 + Foam Removal House	10	270CT11	07NOV11		Excavation for MCL Bay 7 + Foam Removal House
1410	Pile Cap for MLC Bay 7 + Foam Removal House	30	07SEP11	07DEC11		Pile Cap for MLC Bay 7 + Foam Removal House
1420	Construction of MLC Bay 7 + Foam Removal House	60	08NOV11	09MAR12		Construction of MLC Bay 7 + Foam Removal House
1500	Excavation for MLC (Bay 4&5)	15	11APR12	160CT12		Excavation for MLC (Ba
1505	Excavation for MLC (Bay 1-2)	15	06OCT12	200CT12		Excavation for MLC (Ba
	Excavation for MLC (Bay 3 & 6)		18FEB13		-171d	
	Pile Cap + Structural Wall for MLC (Bay 4&5)	_	11MAY12			Pile Cap + St
	Pile Cap + Structural Wall for MLC (Bay 1-2)		22OCT12			L≫annana Pile Cap + Stru
	Construction of residual cantilever slab of AT6		01JAN13			Construction
	Pile Cap + Structural Wall for MLC (Bay 3 & 6)		05MAR13		-171d	
550	Concreting surround for DN1500 Concrete Pipe		17SEP12			
	Excavation for MLC (Bay 8&9)		14JAN13	16FEB13	-618d	Excavatio
	Plie Cap for MLC (Bay 8-1 & 9)		28JAN13	13MAR13	-618d	
	Structural Wall for MLC (Bay 8-1 & 9)		10FEB13		-618d	
	Pile Cap + Structural Wall for MLC (Bay 8-2)		22MAR13		-618d	
	Watertightness Test for MLC				-618d	
	Concrete Coating for MLC		01MAY13			
	Backfilling for MLC	30			-618d	
				22MAY13	-510d	Excavation for Bio-gas Holding Tank Support
	Excavation for Bio-gas Holding Tank Support Pile Head for Bio-gas Holding Tank Support		29APR11			
			11MAY11			Pile Head for Bio-gas Holding Tank Support
	Construction of Blo-gas Holding Tank Support			13AUG11		Construction of Bio-gas Holding Tank Support
	Excavation for Valve Chamber		18AUG11			Excavation for Valve Chamber
	Pile Head Construction for Valve Chamber		110CT11			Pile Head Construction for Valve Chamber Pile Cap for Tank Support & Valve Chamber
	Pile Cap for Tank Support & Valve Chamber		050CT11			
	Structural Wall for Valve Chamber		28NOV11			Structural Wall for Valve Chamber Backfilling for Valve Cham
840	Backfilling for Valve Chamber	30	28JAN12	24SEP12		Le Backfilling for Valve Cham
	Excavaling Trial Pit No. T1 & T2 (SI01)		1BJUN10			Excavating Trial Plt No. T1 & T2 (SI01)
	Diversion of DN150 Fire Fighting Main at SDT3		25AUG10			Diversion of DN150 Fire Fighting Main at SDT3
	Diversion of DN80 Wash Water Pipe at SDT3		20SEP10			Diversion of DN80 Wash Water Pipe at SDT3
003	Diversion of PE Sewage Pipe at SDT3 (RFI/43)	30	180CT10	22OCT10		Diversion of PE Sewage Pipe at SDT3 (RFI/43)
004	Removal of FF, WW & PE after diversion (RFI/43)	10	18JAN13	27JAN13	-320d	Removal of
	Pipework for AT5 - AT7		13APR12			Pipework for AT5 ~ AT7
_	Pipework for Pipe Chamber @PST5		17FEB13		-438d	
	Pipework Connection to AT5 & AT6	10	18JAN13		-320d	
	Pipework for Effluent Chamber	19	290CT12		52.00	Pipework for Effluent
	Pipe Support at Effluent Launder (PVO)		02JAN13		-438d	Pipe Sup
	DN900 Sewage Pipe to PST5		09AUG12		-1000	DN900 Sewage Pipe
	Pipework for SDT3		12MAY13		-469d	
	Pipework for MLC					
	Pipework for Valve Chamber		18JAN13		-355d	Pipework for Valve Chamber
<u>10 </u>		29	07NOV11	13AUG12		
date	29JAN10 Early bar					
h date	25DEC13 Progress bar					
date date	18JAN13 Critical bar					TPSTW Stage 5 Phase 2B
numbe	er 5A Summary bar					
	ara Systems, Inc.					Master Program
'rimave	Finish milestone point					Waster Program

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AT7 (10 pours)
 for PST5 & AT7
15 & AT7
Digestion Tank No.3 (SDT3)
for SDT3 (29 nos)
noving Struts for SDT3
Wall for SDT3
ned Top Slab for SDT3
atertightness Test for SDT3
ir Tightness Test for SDT3
Backfilling for SDT3
ouse
/ 4&5)
y 1-2)
on for MLC (Bay 3 & 6)
ructural Wall for MLC (Bay 4&5)
ctural Wall for MLC (Bay 1-2)
of residual cantilever slab of AT6
le Cap + Structural Wall for MLC (Bay 3 & 6)
nd for DN1500 Concrete Pipe
for MLC (Bay 8&9)
for MLC (Bay 8-1 & 9)
ral Wall for MLC (Bay 8-1 & 9)
Cap + Structural Wall for MLC (Bay 8-2)
Vatertightness Test for MLC
Concrete Coating for MLC
Backfilling for MLC
ber
FF, WW & PE after diversion (RFI/43)
Pipework for Pipe Chamber @PST5
nnection to AT5 & AT6
Chamber
ort at Effluent Launder (PVO)
to PST5
Pipework for SDT3
for MLC
                        Revision
    Date
                                         Checked Approved
7FEB11
0NOV11
                 В
                                         AA
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Act ID	Description	Orig Dur	Early Start	Early Finish	Total Float	2010
32080	DN1500 Air Main	90	08AUG11	15FEB13	-339d	DN1500
32090	Gas Pipe to Gas Transfer Station		28FEB13		-1d	
32100	Gas Pipe connecting Gas Holder Tank		28FEB13		-1d	
33010	Removal of extg Control Room	20	15AUG11	0755812	-331d	
33020	Modi. of Chemical House for Switch Room (VO57)		21NOV11		-3310	Modi. of Chemical House
33030					0001	
	Modi. of extg Flow Splitter Box Stage I (VO16)			28MAR13	-380d	Modi
3040	Modi. of extg Flow Splitter Box Stage II (VO16)		<u> </u>	23AUG13	-528d	
3050	Modification of extg Aeration Tank No. 4			26FEB13	-350d	Modifica
3060	Modification of extg Aeration Tank No. 1~3			21NOV13	-618d	
3070	Modification of extg Effluent Launder Stage I		2BJAN13	28MAR13	-380d	Modi
3075	Modification of extg Effluent Launder Stage II			23AUG13	-118d	
	Shelter for NaOCI Dosing System	+	23MAY13	21JUL13	-510d	
	Watertightness Test for NaOCI Dosing Sheller	15	22JUL13	05AUG13	-510d	
ction IV	of Works					
10010	Section IV of Works	365	29JAN10	25DEC13	10484	
		-			-1048d	
	Pre-drilling for Decanting Chamber (1 no)	-	CONTRACTOR OF CONTRACTOR	11MAY10		Pre-drilling for Decanting Chamber (1 no)
0030	Dismantling Extg Cantilever of PSGT (VO02)		A rest of the local division of the second second	02AUG10		Dismantling Extg Cantilever of PSGT (VO02)
0040	Mini-piling for Decanting Chamber (4 nos)	-	27AUG10			Mini-piling for Decanting Chamber (4 nos)
0050	Proof Drilling (2 nos)	28	19OCT10	260CT10		Proof Drilling (2 nos)
1010	Excavation for Decanting Chamber	10	27OCT10	03NO\/10		Excavation for Decanting Chamber
1020	Plle Cap for Decanting Chamber	+	04NOV10			Pile Cap for Decanting Chamber
1030	Structural Wall for Decanting Chamber		16DEC10			Structural Wall for Decanting Chamber
1040	FRP Cover for Decanting Chamber		28SEP12			FRP Cover for Decant
	Excavation for Chemical & Oil Store					
1050			04AUG10			Excavation for Chemical & Oil Store
	Base Slab for Chemical & Oil Store		20AUG10			Base Slab for Chemical & Oil Store
	Structural Wall for Chemical & Oil Store		14SEP10			Structural Wall for Chemical & Oil Store
1080	Top Slab for Chemical & Oil Store		25OCT10			Top Slab for Chemical & Oil Store
	Conc. Plinth at CHPG Stage I/II (VO64)		07FEB12		-718d	Conc. Plint
1100	Conc. Plinth at Waste Burner (VO60)	120	07FEB12	260CT12		Conc. Plinth at Waste
2010	Removal of Chemical Waste Room	30	23JUL10	24JUL10	- 1	Removal of Chemical Waste Room
2020	Removal of Flower Bed		12JUL10			Removal of Flower Bed
2030	Removal of Waste Blo-gas Burner at Stage I/II		1BJAN13		-796d	Removal
	Removal of Chimney & Associated RC Structure		17FEB13		-796d	
	Removal of Storage Facilities		29AUG12			Removal of Storage Facili
	Water Reclamation Facility for RO Plant (VO97)	+ +	09NOV12		-755d	Water
	Shelter for FeCI3 Dosing System		11NOV10		-1000	Shelter for FeCl3 Dosing System
	Rectification of Shelter for FeCl3 Dosing System			22JAN11		Rectification of Shelter for FeCl3 Dosing System
	Steelwork for FeCI3 Dosing Shelter		20DEC10		-	Steelwork for FeCI3 Dosing Shelter
	Watertightness Test for FeCI3 Dosing Shelter	+ +	14MAR11			Watertightness Test for FeCI3 Dosing Shelter
	Removal of FeCI3 Dosing System	+				► Waterugriniess rest for Pecia Dosing Sherter
			14APR12		10401	
	Modifi of Central Blg Complex (VO43)		10NOV11		-1048d	
	Modification of SAS Thickening House (VO53)		140CT11		-727d	Modificati
	Modi. of Primary Sludge Gravity Thickener (VO02)		22DEC10			Modi, of Primary SI
	Modification of Filtrate Treatment Plant (VO33)		14JAN13		-821d	
	Modification of Chlorination House (VO18)	++	07NOV11		-719d	Modificatio
	Floor Opening at Service Tower Building (16 nos)		240CT11			E Floor Opening at Service Tower Building (16 nos)
	Modi. of Genset Rm at Inlet Works (VO101)	90	02NOV12	13FEB13	-733d	Modi. of
2190	Covered Walkway @ Sludge Dewatering House (VO94)	100	22DEC12	31MAR13	-779d	Cov
010	Road & Drainage Works in Portion A	120	12JUL10	15JUN11		Road & Drainage Works In Portion A
4010	Additional Works for FeCl3 Dosing System	100	28APR11	10AUG11		Additional Works for FeCl3 Dosing System
t date	29JAN10 Early bar	,				
h date	25DEC13 Progress bar					
date	18JAN13 Critical har					TPSTW Stage 5 Phase 2R
date	20JAN13					
e numbe						Master Program
	ra Systems, Inc.					

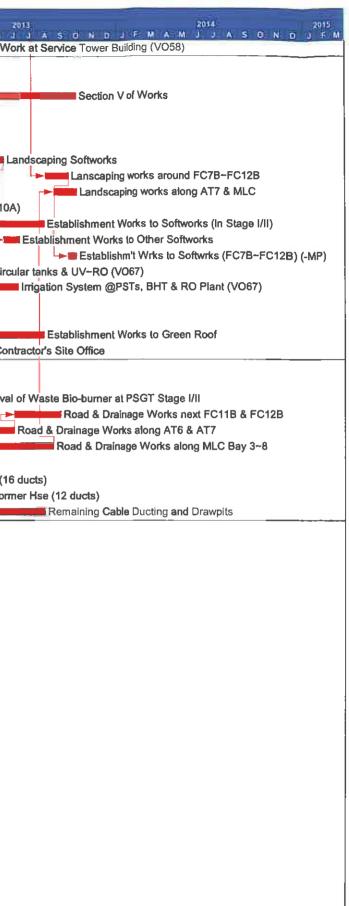
2013	DJFMAM	2014		2015
r Main	DJFMAM	al di di i	A 5 0 N	DJEM
s Pipe to Gas Tran	sfer Station			
s Pipe connecting				ļ
exig Control Room	1			
for Switch Room (
· · · ·	r Box Stage I (VO1)	5)		
	extg Flow Splitter Bo		II (VO16)	
on of extg Aeration		on otage	11 (1010)	
1	Modification of exte	Agration	Took No. 1	- 2
i L	-	-	I I deik NU, I	-3
	ent Launder Stage I		Stoco II	
1	ion of extg Effluent		Stage It	
	aOCI Dosing System		DL _0	
Vvatertightr	ness Test for NaOC	Dosing		
				1
	Section IV of W	/orks		
g Chamber				
3				
	(1/064)			
at CHPG Stage I/II	(VU04)			
Burner (VO60)				
	_			
f Waste Bio-gas B	-			
oval of Chimney 8	Associated RC Str	ucture		
es				
eclamation Facility	for RO Plant (VO97	7)		
	Modifi of Centr	al Blo Co	mplex (VO4	3)
of SAS Thickening				-/
lge Gravity Thicker	- • •			
		(1022)		1
	te Treatment Plant	(VU33)		
of Chlorination Hou	ise (VO18)			
L				
enset Rm at Inlet W				[
ed Walkway @ Slu	Idge Dewatering Ho	use (VO	94)	
			_	
Date	Revision	-	Checked	Approved
7FEB11	B		AA	TKC
0NOV11			AA	TKC
3APR12	D		AA	ТКС
8JAN13	E		AA	ТКС

Act ID	Description.	Orig Early Dur Start	Early Finish	Total Float	2010 - 2011 - 2012 FMAMJJASONOJEMAMJJASONOJEMAMJJASONOJEM	IS L M A
44020	Additional Work at Service Tower Building (VO58)	20 18JAN13	06FEB13	-726d		tional Wor
Section	V of Works		land the			11
11111	Children P. Standard			1		
50010	Section V of Works	1185 29JAN10	140CT13	-170d		
50020	Tree Survey	60 08MAR10	09APR10		Tree Survey	
50030	Tree Transplanting & Felling Tree	90 22APR10	260CT10		Tree Transplanting & Felling Tree	
50040	Establishment Works to Transplanted Tree	365 03NOV10	02NOV11		Establishment Works to Transplanted Tree	
50050	Landscaping Softworks	650 21JUL10	27MAY13	-60d		La
50056	Lanscaping works around FC7B-FC12B	45 16AUG13	29SEP13	-171d		
50058	Landscaping works along AT7 & MLC	45 01SEP13	15OCT13	-171d		
50060	Establishment Works to Softworks (FC1A-FC10A)	365 12MAR11	11MAR12		Establishment Works to Softworks (FC1A	4~FC10A)
50065	Establishment Works to Softworks (in Stage I/II)	365 14AUG12	13AUG13	-108d		
50070	Establishment Works to Other Softworks	30 28MAY13	26JUN13	-60d		
50072	Establishm't Wrks to Softwrks (FC7B~FC12B) (-MP)	16 30SEP13	150CT13	-171d		
50080	Irrigation System @circular tanks & UV~RO (VO67)	120 28JUL12	310CT12		► Inigation System	m @circul
50085	Irrigation System @PSTs, BHT & RO Plant (VO67)	45 11MAY13	24JUN13	-58d		┶⋗∎
50090	Green Roof at Sludge Dewatering System	120 05JAN12	19MAR12		Green Roof at Sludge Dewatering Syste	in .
50100	Green Roof at Transformer House	120 05JAN12	19MAR12		Green Roof at Transformer House	
50110	Establishment Works to Green Roof	365 14AUG12	13AUG13	-108d		÷
50120	Green Roof at Contractor's Site Office	20 28NOV12	17DEC12		Green Roo	of at Cont
244						
51010	Diversion of DN600 Concrete Pipe	45 18MAY10	25AUG10		Diversion of DN600 Concrete Pipe	
51020	Removal of Waste Bio-burner at PSGT Stage I/II	60 18JAN13	18MAR13	40d		Removal o
51030	Road & Drainage Works next FC11B & FC12B	90 17JUN13	14SEP13	-140d		
51040	Road & Drainage Works along AT6 & AT7	120 17FEB13	16JUN13	-140d		
51045	Road & Drainage Works along MLC Bay 3~8	120 04MAY13	31AUG13	-171d		
51050	Cable Ducting and Drawpits for FC11B & FC12B	20 18JUL11	14AUG11	ĺ	Cable Ducting and Drawpits for FC11B & FC12B	
51070	Cable Ducting % CBC & Transformer Hse (16 ducts)	60 03NOV11	13APR12		Cable Ducting % CBC & Transformer	
51080	Cable Ducting % CBC & Transformer Hse (12 ducts)	60 01MAR12	24JUL12		Cable Ducting % CBC & T	ransforme
51100	Remaining Cable Ducting and Drawpits	350 28MAY12	15AUG13	-110d		

Start date	29JAN10	Early bar
Finish date	25DEC13	Progress bar
Data date	18JAN13	Critical bar
Run date	20JAN13	
Page number	r 7A	Summary bar
c Primaven	a Systems, Inc.	Start milestone point
		Finish milestone point

TPSTW Stage 5 Phase 2B

Master Program



Date	Revision	Checked	Approved
7FEB11	B	AA	TKC
IONOV11] C	AA	TKC
3APR12	D	AA	TKC
8JAN13	E	AA	TKC