China Harbour Engineering Company Limited

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

Quarterly Environmental Monitoring and Audit Summary Report (October to December 2013)

(Version 1.0)

Certified By	Chip Min (Environmental Team Leader)
EMARKS:	

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

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EXECUTIVE SUMMARY

Introduction

- 1. This is the 14th Quarterly Environmental Monitoring and Audit (EM&A) Summary Report prepared by Cinotech Consultants Limited (the Environmental Team, ET) for DSD Contract no. DC/2009/09 "Construction of Tai Po Sewage Treatment Works Stage V Phase IIB". This summary report presents EM&A works performed in the period between October and December 2013.
- 2. The construction activities undertaken in the reporting quarter include:
 - 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 was performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
- 4. Summary of the events and action taken in the reporting quarter is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Quarter

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

Construction Noise

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

Air Quality

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

Landfill Gas

8. In the reporting period, all the excavation works that at 1m depth or more have been finished or backfilled. No landfill gas monitoring was necessary in the period.

Environmental Complaint and Prosecution

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

Environmental Licensing and Permitting

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

Future Key Issues

- 11. The anticipated environmental impacts will be mainly on ponding water and surface runoff as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
 - Cable ducting works;
 - Fabrication of walkway for SDT3;
 - Backfilling for SDT3;
 - Backfilling for MLC;
 - Gas Pipe to Gas Transfer Station;
 - Gas Pipe connecting Gas Holder Tank;
 - Modification works of Aeration Tank No.1-3, RAS Pump Platform Station;
 - Sealing channel from EL to Flow Splitter Box;
 - Removal of Waste Bio-gas Burner at Stage I/II;
 - Removable Handrailing at Inlet Works;
 - Landscaping works;
 - Road and Drainage Works next to FC11B and FC 12B, along AT6 and AT7, along MLC Bay 3-8; and
 - Concrete paving around FC7B FC12B.

1. INTRODUCTION

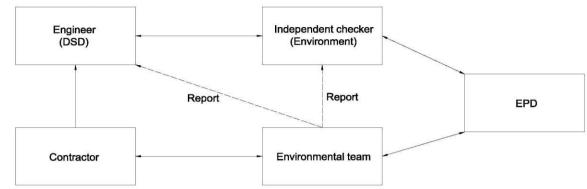
Background

- 1.1 Tai Po Sewage Treatment Works (TPSTW) is located within the Tai Po Industrial Estate. It currently comprises four Stages: I, II, IVA and IVB works. The TPSTW Stage V aims to upgrade the existing STW to provide additional sewage treatment capacity from the present design flow of 88,000 m³/day to 130,000 m³/day to meet the demands of both the existing and future developments, and to meet the revised discharge license requirements.
- 1.2 The TPSTW Stage V, Phase I and Phase II are Designated Projects under the Environmental Impact Assessment Ordinance (Cap. 449) with the same EIAO Register No. AEIAR – 081/2004. A study of environmental impact assessment (EIA) was undertaken to evaluate various environmental impacts associated with the works within these two Designed Projects. An EIA Report as well as an Environmental Monitoring and Audit (EM&A) Manual were approved by the Environmental Protection Department (EPD) on 28 October 2004.
- 1.3 The Stage V works will be implemented in 2 phases. The design capacities of Phase I and Phase II works are 100,000 m³/d and 130,000 m³/d respectively. An Environmental Permit (EP) No. EP-265/2007 was issued on 22 March 2007 for the TPSTW Stage V Phase II to the Drainage Services Department (DSD) as the Permit Holder. The project "Tai Po Sewage Treatment Works Stage V Phase IIB" formed part of the Phase II works, includes additional secondary treatment process units (1 primary clarifier; 3 bioreactors and 2 final clarifiers) in TPSTW for its future extended plant design capacity of 120,000 m³/day. A master construction programme of the Project is provided in Appendix A. A site layout plan is provided in Figure 1.1. The construction activities of the Project commenced on 3 July 2010.
- 1.4 Cinotech Consultants Ltd. was commissioned by the Contractor as the Environmental Team (ET) to undertake the EM&A works for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the EP. Ove Arup and Partners Hong Kong Ltd. was appointed as the IEC under Condition 2.2 of the EP. This is the 14th quarterly EM&A summary report summarizing the EM&A works for the Project between October and 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
 - E&M Contractor China Harbour Engineering Company Ltd.
- 1.6 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.7 The Project Organization during Construction Phase



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

Table 1.1	Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.	
	SP Division	Mr. LAI cheuk-ho	Chief Engineer	2594 7500		
DSD		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		
Armo	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2528 3031	
Arup			Mr. Ken LEE	Assistant to Independent Environmental Checker	2268 3573	2328 3031
		Mr. TK CHEUNG	Project Manager	9863 2954		
CHEC	Civil Contractor	Mr. Aaron AU	Site Agent	6345 0754	2603 6899	
		Mr. Jason TSE	Environmental Offiecr	6628 5739		

Construction Programme and Synopsis of Work

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

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

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

Monitoring Methodology and Calibration Details

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

Environmental Quality Performance Limits (Action and Limit Levels)

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

Environmental Mitigation Measures

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

3. MONITORING RESULTS

Weather Conditions

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

Air Quality

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

Construction Noise

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

Landfill Gas

3.7 No landfill gas monitoring was necessary in the reporting period.

4. AUDIT RESULTS

Implementation Status of Environmental Mitigation Measures

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

Site Audit Summary

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

Parameters	Date	Observations and Recommendations	Follow-up
	27 September 2013	Reminder: Clear the sand and mud near the car washing bay.	The observation was observed to be improved/rectified by the Contractor during the audit session on 4 October 2013.
	4 October 2013	<u>Reminder:</u> Stand water was observed near tank no.11. The contractor was reminded to clear the stand water.	The observation was observed to be improved/rectified by the Contractor during the audit session on 11 October 2013.
	18 October 2013	Reminder: Stand water in idle sedimentation tank should be cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 25 October 2013.
	30 October 2013	Reminder: Stand water near FC 2B and 4B should be cleared.	The observation was observed to be improved/rectified by the Contractor during the audit session on 8 November 2013.
Water Quality	8 November 2013 Quality	<u>Reminder:</u> Silt settled in wheel washing facility should be cleared regularly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 November 2013.
	29 November 2013	Reminder: 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.
	13 December 2013	<u>Reminder:</u> 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	Observation: 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.

 Table 4.1
 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Noise	N/A	N/A	N/A
	27 September 2013	Reminder: Clear the scrap metal near the haul road.	The observation was observed to be improved/rectified by the Contractor during the audit session on 4 October 2013.
Waste / Chemical	4 October 2013	<u>Reminder:</u> Construction materials were observed to accumulate near tank no. 9. The contractor was reminded to clear the construction materials and dispose of properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 11 October 2013.
Management	8 November 2013	Reminder: Construction waste should be cleared from area near FC2B and FC4B.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 November 2013.
	15 November 2013	Reminder: Cement not in use should be cleared	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 November 2013.
Permit/Licens es	N/A	N/A	N/A

Status of Environmental Licensing and Permitting

4.3 Environmental licenses and permits including the Environmental Permit (EP), the Construction Noise Permit and Waste Disposal (Chemical Waste) License were in place and valid during the reporting quarter. A summary of environmental licensing and permit status is given in **Appendix H**.

Advice on Waste Management Status

4.4 111 m³ of inert C&D waste, 210 kg of non-inert C&D waste and 30 m³ of general refuse were disposed in the reporting quarter. 200 kg of metals and 10 kg of paper/cardboard packaging were disposed in the reporting quarter. No chemical waste was generated in the reporting period. The amount of wastes generated by the activities of the Project in the reporting period fulfills the requirement of estimated volume of excavated material in EIA Report. The amount of wastes generated by the activities of the Project in the reporting period was attached in the appendices of the Monthly Reports for October to December 2013. Waste flow table please refer to **Appendix I**.

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

Summary of Exceedances

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

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

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

6. ENVIRONMENTAL COMPLAINTS AND PROSECUTIONS

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

7. COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

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

Effectiveness of Mitigation Measures

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

Conclusion

- 7.3 All measured 1-hour and 24-hour TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.4 All measured noise levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.5 All landfill gas monitoring levels were below the Action/Limit Levels. No exceedance was recorded in the reporting quarter.
- 7.6 There was no environmental complaint, prosecution or notification of summons received.
- 7.7 The anticipated environmental impacts will be mainly on ponding water and surface runoff after rain as well as the noise nuisance and dust emission from the major construction activities will be undertaken in the coming quarter, including:
 - Cable ducting works;
 - Fabrication of walkway for SDT3;
 - Backfilling for SDT3;
 - Backfilling for MLC;
 - Gas Pipe to Gas Transfer Station;
 - Gas Pipe connecting Gas Holder Tank;
 - Modification works of Aeration Tank No.1-3, RAS Pump Platform Station;
 - Sealing channel from EL to Flow Splitter Box;
 - Removal of Waste Bio-gas Burner at Stage I/II;
 - Removable Handrailing at Inlet Works;
 - Landscaping works;
 - Road and Drainage Works next to FC11B and FC 12B, along AT6 and AT7, along MLC Bay 3-8; and
 - Concrete paving around FC7B FC12B.

Recommendations

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

Water Impact

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

Dust Impact

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

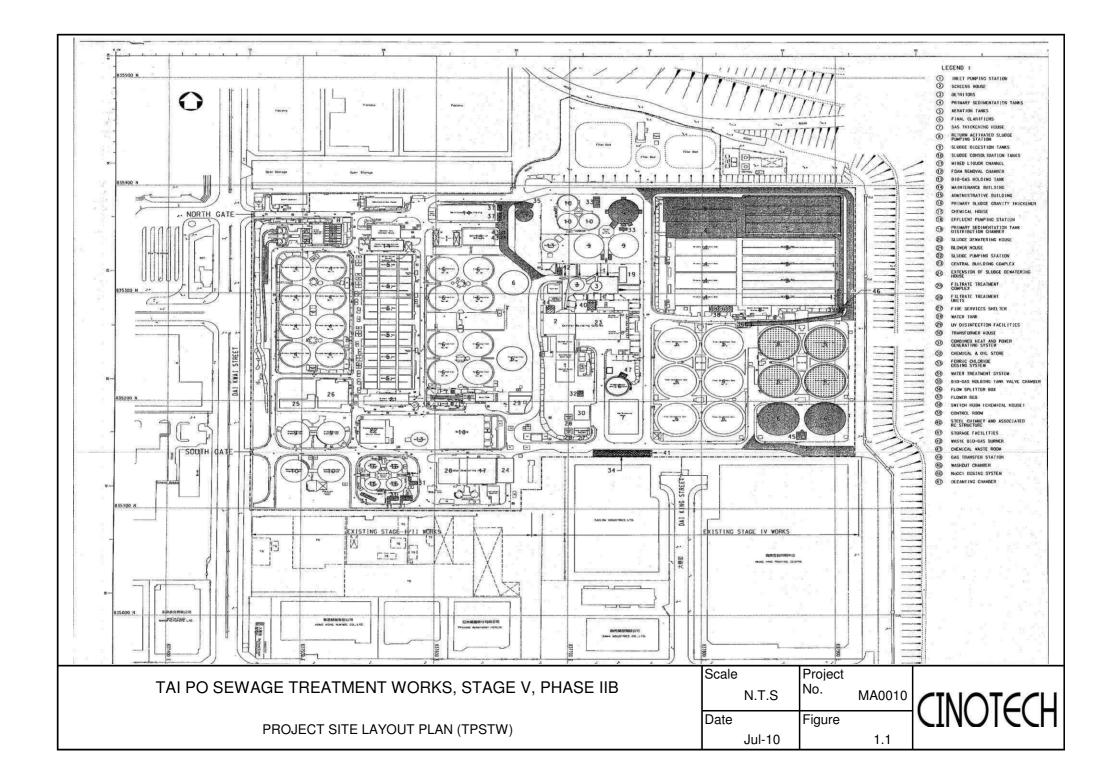
Noise

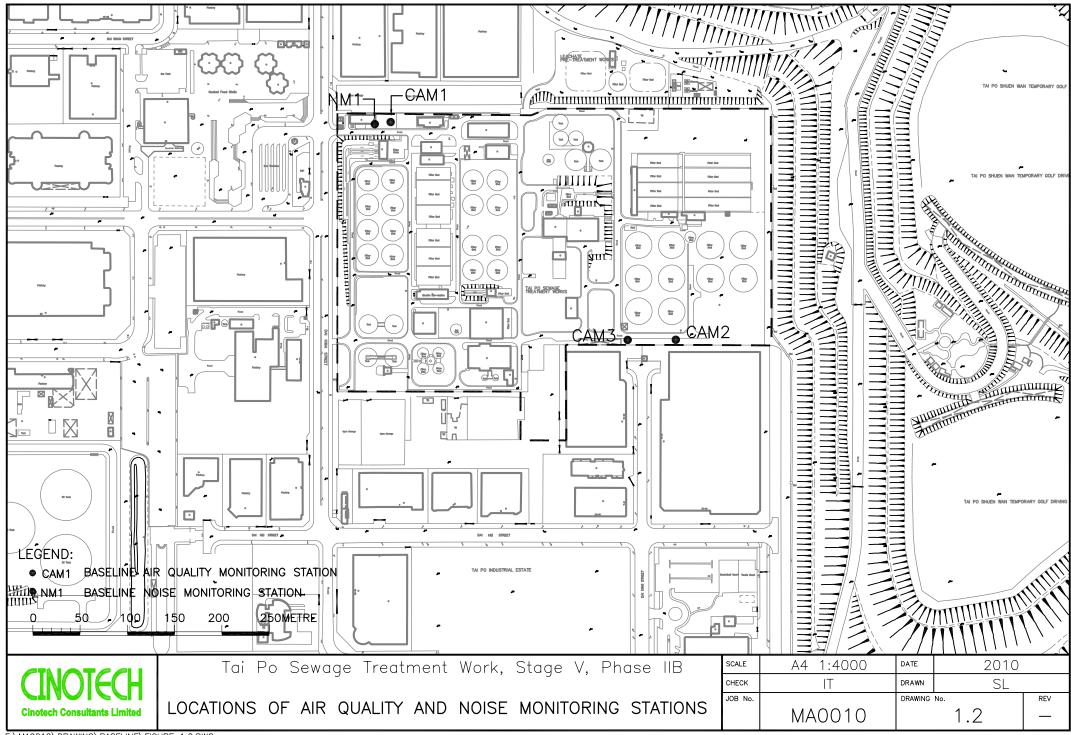
• Keep the monitoring equipment function properly.

Waste / Chemical Management

- Avoid and check for any accumulation of waste materials or rubbish on site.
- Avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment.
- Provide drip tray with adequate capacity and maintain well for equipment and chemical waste.
- Provide proper rubbish bins / skips for waste collection.
- Sort and disposal of C&D waste and general refuse properly.
- Proper label the chemicals on site and store properly with drip tray.

FIGURES





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

APPENDIX A CONSTRUCTION PROGRAMME

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

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

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

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

Act	Description	Orig	Early	Early	Total	%	2010			2011		2012			2013	3
ID بی		Dur	Start	Finish	Float	SAN SAN F	FMAMJJ	AS	ONDJFMA	MJJASO	NDJFM	AMJJ	ASON	DJFM		
23040	Construction of new Drawoff Chamber 3 (VO13)	_	25FEB13	12JUL13		100										Cons
23045	Watertightness Test for Drawoff Chamber 3 (VO13)			02OCT13	· • · · · · · · · · · · · · · · · · · ·	100										
Service Company and Company	Backfilling for new Drawoff Chamber 3 (VO13)	30	0900113	02NOV13		100									1	_
	l of Works					2000										
Drilling						400	Notification		 Engineer							
30001	Notification from Engineer			02APR10		100	Notification		Engineer J							
30010	Section III of Works Site Clearance		03MAY10	1	59d	95			l				in the first first first first search and the second second			
30020			28MAY10	02OCT10		100 100			Pre-drilling for PST	5 AT5~AT7 (/1 r	() ()					
	Pre-drilling for PST5, AT5~AT7 (41 nos) Pre-drilling for Mixed Liquor Channel 1 (25 nos)				+				-drilling for Mixed L	1 1 1	1 .					
30040	Pre-drilling for Mixed Liquor Channel 2 (6 nos)			24AUG10 150CT10		100 100			Pre-drilling for Mixed	1° 1 'I					1	
30060	Prelimiary Socketted H-piling	_		230CT10		100			Prelimiary Socke	1 1 1						
30070	Load Test for Preliminary Socketted H-pile	14		27NOV10		100			11 ·	Preliminary Sock	 etted H-nile					
30080	Socketted H-piling for PST5, AT5~AT7 (174 nos)	263				100			1	cketted H-piling for	-	 T7 (174 no:	s)			
30090	Proof Drilling for PST5 & AT5-AT7 (174 hos)	- · · ·	21MAR11			100			I i	Proof Drilling for P	1	1				
30100	Load Test for Socketted H-pile (2 nos)	14		31MAR11		100			I I I	oad Test for Sock	1	1 · ·				1
30110	Pre-drilling for Sludge Digestion Tank (7 nos)			290CT10		100			Pre-drilling for S	1 1 1						
30120	Socketted H-piling for SD Tank (29 nos)			22MAR11		100			11 10	ocketted H-piling f	1	nos)				
30120	Proof Drilling for Sludge Digestion Tank (2 no)			03JUN11		100			1 1111	Proof Drilling		1 1	(2 no)			
30130	Load Test for Sludge Digestion Tank (2 no)		01APR11	12APR11		100			1 110 -	Load Test for Sluc		1 1			1	
30140	Preliminary Mini-pile for Mixed Liquor Channel	- I. · ·		29NOV10		100		Щ	► III	.F		4 1 1				· ·
30160	Load Test for Preliminary Mini-pile (1 no)		03JAN11	10JAN11	+	100				st for Preliminary N	1 ·					
30170	Mini-piling for Mixed Liquor Channel (43 nos)	_	03NOV10			100		−₫	Mini-pili	1 1		nos)				
30180	Mini-piling for Mixed Liquor Channel (16 nos)			07MAY11		100				Mini-piling for M	1	1	os)			
30190	Mini-piling for MLC (M60~M67)	_	31MAY11			100				Mini-piling f	1	1 1				
30200	Mini-piling for MLC (M68~M79)			07APR12		100					1 1 11 11 1 1 1 1 1 1 1		for MLC (Me	68~M79)		
30210	Mini-piling for MLC (M17 & M20) (VO97)	45				100									ling for ML	.C (M
30220	Proof Drilling for Miixed Liquor Channel (1 no)	7	25JUL11	29JUL11		100		ļ		Proof D	rilling for Miixed	Liquor Cha	annel (1 no)			
30230	Remaining Proof Drilling for MLC (1 no)	14	08OCT12	170CT12		100		ľ					Ren	naining Pro	of Drilling f	for M
30235	Proof Drillig for add. 4 piles of MLC (VO97)	14	04FEB13	02MAR13		100		ľ		· ·				P	roof Drillig	for a
30240	Load Test for Mixed Liquor Channel (1 no)	14	20APR12	27APR12		100					L	Load Te	est for Mixed	Liquor Cha	nnel (1 no))
30250	Pre-drilling for Bio-gas Holding Tank (3 nos)	10	20JUL10	26AUG10	· · · ·	100		Pre	-drilling for Bio-gas	Holding Tank (3	nos)	· · .				· .
30260	Mini-piling for Bio-gas Holding Tank (4+8 nos)	52	10JAN11	03MAR11		100				i-piling for Bio-gas						
30270	Proof Drilling for Bio-gas Holding Tank (1 no)	7	11APR11	05MAY11		100			│││\\+₽►∎	Proof Drilling to	r Bio-gas Holdin	g Tank (1 r	10)			
30300	Load Test for Bio-gas Holding Tank Area (1 no)	14	04APR11	11APR11		100				Load Test for Bio-	gas Holding Ta	nk Area (1 i	no)			
Primary	Sedimentation Tank & Aeration Tank											· · ·				
31000	Excavation for AT5 & AT6 1st pour			25MAY11		100				<u></u>	r AT5 & AT6 1s	11 - 1				
31010	Excavation for AT5 & AT6 2nd pour		26MAY11			100		-			avation for AT5	I I	. 0			·
31020	Pile Head for AT5 & AT6 1st pour (63 nos)	_	-			100			 ▶		for AT5 & AT6					
120 22	Pile Head for AT5 & AT6 2nd pour (45 nos)	_	08JUL11	17SEP11		100					e Head for AT5	1 1	pour (45 nos	;)		·
31040	Pile Cap for AT5 & AT6 1st pour			03AUG11		100				· · · · · · · · · · · · · · · · · · ·	p for AT5 & AT	[]· · · ·]·				·
8 6 m	Pile Cap for AT5 & AT6 2nd pour			040CT11		100	· · .			, ⊨ ∎₽	ile Cap for AT5		3I I			
88 ST	Structural Wall for AT5 & AT6 1st pour (14pours)		1	19DEC11	-	100						1 F	T5 & AT6 1st		1	
888 E.P	Structural Wall for AT5 & AT6 2nd pour (10pours)			18FEB12	++	100	· · ·					1 C	I for AT5 & A	11 .	ir (10pours	9 -
200 IO	Watertightness Test for AT5			16MAR12		100		1			1		ess Test for			
255 AS	Watertightness Test for AT6				-	100						waterti	ghtness Test	TOT A 16		
88.8	Backfilling for AT5			10APR12		100						Backfilling				
※1公	Backfilling for AT6			02AUG12		100						I I	Backfilling f	0FA16		
200	Excavation for Effluent Chamber	· · · · · · · · · · · · · · · · · · ·		01DEC11	· · · · · · · · · · · · · · · · · · ·	100					Excavation	I E	ו זנ		1	
28 X	Pile Head for Effluent Chamber (15 nos)				+	100		[/			Pile Head for E			»)		
線際	Pile Cap for Effluent Chamber		02DEC11	15DEC11		100	[. I'						. . at Chambe		
[総図]	Structural Wall for Effluent Chamber			16MAR12		100		[/					Vall for Efflue			
26 M	Top Slab & Upstand Wall of Effluent Chamber			31MAR12	(100		[/					Watertight			
36 - C	Watertightness for Effluent Launder			13AUG12		100		ļ					ion for PST5			
	Excavation for PST5			24APR12		100							n of Platform	11	 had Test (\	1
	Provision of Platform for Add. Load Test (VO56)	15	TTAPR12	21APR12	I	100		!								
Start date	29JAN10 Early bar 99MAY14 Early bar													-		23
Finish date Data date	20DEC13						China II	o ele i	our Engine -	ring Co. 14	4					18
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Watertightness	awoff Chamber 3 (VO13) Test for Drawoff Chamber 3 or new Drawoff Chamber 3 (\	(VO13) /O13)	
Sec	tion III of Works		
; 17 & M20) (VO97) ; LC (1 no) dd. 4 piles of MLC			· · · · · · · · · · · · · · · · · · ·
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	Act	Orig Early Total o/ 2014 2015
3101 Add Logt Mark (17) (000) 11 (3200/2) 11		
1000 Pick 10000 Pick 10000	31215 Add. Load Test for AT7 (VO56)	
3 000 million 1000 millio	31218 Excavation for AT7	15 09JAN12 22JUN12 100
1300 The state Art 10 arcs 1200 res 1200 res <td>31220 Pile Head for PST5 Pipe Chamber (6 nos)</td> <td>14 19AUG11 04OCT11 100 Pile Head for PST5 Pipe Chamber (6 nos)</td>	31220 Pile Head for PST5 Pipe Chamber (6 nos)	14 19AUG11 04OCT11 100 Pile Head for PST5 Pipe Chamber (6 nos)
1400 PECKET VPETCE CONDUCT 000 1400 PECKET VPETCE VPECKET VPECKET VPETCE VPETCE VPECKET VPECKET VPECKET VPECKET VPECKE	31230 Pile Cap for PST5 Pipe Chamber up to base soffit	30 17OCT11 04NOV11 100
1350 Philosoph (17) 131 Section (17) 131 Sectio (17) 131 Section (17	31240 Pile Head for AT7 (30 nos)	
1355 Hold Stage Parts 171 172	31245 Pile Head for PST5 (15 nos)	28 01FEB12 23APR12 100
3100 Avdarg Water Kristen A. 2017 Construction Cons	31250 Pile Cap for AT7	30 13FEB12 16JUL12 100
3270: Weightings There to P(15: 8, 4/7) 10 Weightings There to P(15: 8, 4/7) 10 3270: Weightings There to P(15: 8, 4/7) 10 Meightings There to P(15: 8, 4/7) 10 3270: Weightings There to P(15: 8, 4/7) 10 Meightings There to P(15: 8, 4/7) 10 3270: Weightings There to P(15: 8, 4/7) 10 Meightings There to P(15: 8, 4/7) 10 3280: Meightings The Hard To P(15: 7, 4/7) 10 Meightings The Hard To P(15: 7, 4/7) 10 3280: Meightings The Hard To P(15: 7, 4/7) 10 Meightings The Hard To P(15: 7, 4/7) 10 3280: Meightings The Hard To P(15: 7, 4/7) 10	31255 Pile Cap for PST5	
1000 Description Part A 27 10 Sector 2 Notes 2000 Description Part A 27 10 Sector 2 Notes	31260 Structural Wall for PST5 & AT7 (10 pours)	
12020 Addit of Ruce Dependent in Rule 3 20 Section 14 (Rule 2004) 1000 2020 Addit of Ruce Dependent in Rule 2007 2000 10000 1000 </td <td>31270 Watertightness Test for PST5 & AT7</td> <td></td>	31270 Watertightness Test for PST5 & AT7	
1202 International Rest 2000 (September Text 6.3 GOT) 0.9 0.0000 (September Text 6.3 GOT) 0.9 0.	31280 Backfilling for PST5 & AT7	
1111 Finded Genetacion for SOTI (22 roots) 00 562/29 (1/00112 00001 1120 Finded Genetacion for SOTI (22 roots) 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 000000 000000 000000 000000 000000 000000 000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 0000000 00000000 000000000000 000000000000000000000000000000000000	31290 Details of Sludge Digestion Tank No. 3	30 28FEB12 24APR12 100 Details of Sludge Digestion Tank No. 3
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1222 Bastler + Texnolog State (r 607) 32 200/02 200/00 1350 Hundler Volg State (r 607) 40 (490/01) 600 1350 Hundler Volg State (r 607) 20 200/02 200/01 1000 1350 Hundler Volg State (r 607) 20 200/02 200/01 1000 1000 1350 Hundler Volg State (r 607) 20 200/01 200/01 1000/01	31310 Pile Head Construction for SDT3 (29 nos)	20 15SEP12 17OCT12 100
1330 Boundari Wat for 5071 0 (2000) (2000) (2001) 0 (2000) (2001) (2001) 0 (2000) (2001) (200	31320 Base Slab for SDT3	
19:00 Number Top Bale & 6070 40 NUMBER Top Bale & 6070 1000000000000000000000000000000000000	31325 Backfilling + Removing Struts for SDT3	
19-100 Beathings of Bathesis for 46 (207) 300 (007) 100	31330 Structural Wall for SDT3	
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19720 Buschfing for 6073 15 2.2.4.0.11 0 0 19700 Buschfing for 6073 0 <td>31350 Watertightness Test for SDT3</td> <td></td>	31350 Watertightness Test for SDT3	
14360 Lagging for 5075	31360 Air Tightness Test for SDT3	
19400 Disputision for MC, Bay 2 + Fram Removel House 00 / 200111 07000111	31370 Backfilling for SDT3	
19/14/2 Pile Carpto MAC Bay 7 + Som Removel House 300 Standard III Bay 7 + Som Removel House 19/14/2 Pile Carpto MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III Bay 7 + Som Removel House 19/14/2 Excenden MAC Bay 7 + Som Removel House 100 Standard III	31380 Lagging for SDT3	55 04FEB14 30MAR14 0 0
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19500 Evanamine for M.C (Bry 440) 16 111/211/212 1000 19500 Evanamine for M.C (Bry 440) 16 1000/112 1000 19500 Evanamine for M.C (Bry 34.6) 15 1000/112 1000 1000/112 1000 1000/112 1000 1000/112 1000 1000/112 <t< td=""><td>31410 Pile Cap for MLC Bay 7 + Foam Removal House</td><td></td></t<>	31410 Pile Cap for MLC Bay 7 + Foam Removal House	
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1910 Disk Compton Statutor Water MLC (Bay 440) Operating Compton Operating Compton<	31505 Excavation for MLC (Bay 1~2)	15 06OCT12 20OCT12 100 Excavation for MLC (Bay 1~2)
15:00 Piles Cape Structure Wall for MLC (Bay 1-2) 00 220/11 220/11 15:00 Piles Cape Structure Wall for MLC (Bay 28.4) 100 11:00	31508 Excavation for MLC (Bay 3 & 6)	
1552 Occession of residual celliever site of ATC 30 01AN12 22AN13 1000 1550 Pile Cap ForMucci Wall for ML (Bay 3.6.) 00 10000 10000 10000 1000	31510 Pile Cap + Structural Wall for MLC (Bay 4&5)	
1500 Precedup 49 Expected Well for MLC (Bay 3.6.0) 001 Precedup 49.6.0 Pre	31520 Pile Cap + Structural Wall for MLC (Bay 1~2)	
1959 Concreting surround for DN1900 Concretive Pipe 30 (TSEP12 100EC12 100EC) 1000 1950 Excerving for MLC (Bay & 1.8.9) 45 (2ANN13 134AN13 1000 1000 Excerving for MLC (Bay & 2.8.9) 100E (2a) (CBay & 3.8.9) 100E (CBay & 3.8.9)	31525 Construction of residual cantilever slab of AT6	
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32006 Pipework for Pipe Chamber @PST5	98 07MAR13 260CT13 10		Pipework for Pipe Chamber @PST5
32020 Pipework for Effluent Chamber	19 290CT12 03NOV12 10		► Pipework for Effluent Chamber
32025 Pipe Support at Effluent Launder (PVO)	30 02JAN13 23JAN13 10		Pipe Support at Effluent Launder (PVO)
32030 DN900 Sewage Pipe to PST5	90 09AUG12 10NOV12 10		DN900 Sewage Pipe to PST5
32040 Pipework for SDT3	30 21SEP13 02OCT13 10		Pipework for SDT3
32070 Pipework for Valve Chamber	29 07NOV11 13AUG12 10		Pipework for Valve Chamber
32080 DN1500 Air Main	90 08AUG11 30MAY13 10		DN1500 Air Main
32083 Pipe Support for DN1500 Air Main @CBC	45 15JUL13 28SEP13 10		Pipe Support for DN1500 Air Main @CBC
32086 Pipe Support for DN1500 Air Main @AT7	15 29DEC13 12JAN14 77d		Pipe Support for DN1500 Air Main @AT7
32090 Gas Pipe to Gas Transfer Station	60 20FEB14 20APR14 -21d		Gas Pipe to Gas Transfer Station
32100 Gas Pipe connecting Gas Holder Tank	60 20FEB14 20APR14 -21d		Gas Pipe connecting Gas Holder Tank
Modification / Removal Works			
33010 Removal of extg Control Room	30 15AUG11 08MAR13 10		Removal of extg Control Room
33020 Modi. of Chemical House for Switch Room (VO57)	90 21NOV11 050CT12 10		Modi. of Chemical House for Switch Room (VO57)
33030 Modi. of extg Flow Splitter Box Stage I (VO16)	60 02MAR13 19JUL13 10		Modi. of extg Flow Splitter Box Stage I (VO16)
33040 Modi. of extg Flow Splitter Box Stage II (VO16)	60 08JUL13 03SEP13 10		Modi. of extg Flow Splitter Box Stage II (VO16)
33050 Modification of extg Aeration Tank No. 4	30 01JAN14 30JAN14 59d		Modification of extg Aeration Tank No. 4
33060 Modification of extg Aeration Tank No. 1~3	60 11MAR14 09MAY14 -40d		Modification of extg Aeration Tank No. 1
33070 Modi. of extg Effluent Launder (EL) Stage I	60 02MAR13 25MAR13 10		Modi. of extg Effluent Launder (EL) Stage I
33075 Sealing channel from EL to Flow Splitter Box	30 11MAR14 09APR14 -10d		Sealing channel from EL to Flow Splitter B
33080 Shelter for NaOCI Dosing System	60 29AUG13 29OCT13 10		Shelter for NaOCI Dosing System
33090 Watertightness Test for NaOCI Dosing Shelter	15 21SEP13 03OCT13 10		₩ Watertightness Test for NaOCI Dosing Shelter
Variation Order			
33100 Sealing openings for E&MP for SDT3 (VO/128)	0 04DEC13 14DEC13 10		₩ Sealing openings for E&MP for SDT3 (VO/128)
33110 Temporary diversion of extg air main at AT4	10 21DEC13 31DEC13 59d 7		Temporary diversion of extg air main at AT4
33120 Walkway on conc. bridge at SDT3 (VO124)	20 02FEB14 21FEB14 2d		Walkway on conc. bridge at SDT3 (VO124)
Section IV of Works			
Drilling Works			
40010 Section IV of Works	384 29JAN10 22APR14 -1161d 6	8	Section IV of Works
40020 Pre-drilling for Decanting Chamber (1 no)	7 06MAY10 11MAY10 10	🖬 가지 나는 사람이 가지 않아? 👔 이 이 지난 것 같아? 것 같아요. 이 것 같아요. 이 이 이 가지 않아? 이 이 이 이 가지 않는 것 같아요. 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이	
40030 Dismantling Extg Cantilever of PSGT (VO02)	14 22JUL10 02AUG10 10		
40040 Mini-piling for Decanting Chamber (4 nos)	28 27AUG10 130CT10 10		un de la companya de
40050 Proof Drilling (2 nos)	28 190CT10 260CT10 10		n fan de stal gelegen de stel 🖬 este meer ten stal de stel de st
Structural Works			
41010 Excavation for Decanting Chamber	10 270CT10 03NOV10 10	0 Excavation for Decanting Chamber	이는 이번 이번 NET 이번 방법에 NET
41020 Pile Cap for Decanting Chamber	20 04NOV10 15DEC10 10		- 가슴 등을 알려 있는 것을 다시네. [1] 물질을 가려서 한 것을 만하는 것이다.
41030 Structural Wall for Decanting Chamber	30 16DEC10 31JAN11 10		
41040 FRP Cover for Decanting Chamber	20 28SEP12 17OCT12 10		► FRP Cover for Decanting Chamber
41050 Excavation for Chemical & Oil Store	15 04AUG10 19AUG10 10		
41060 Base Slab for Chemical & Oil Store	20 20AUG10 13SEP10 10	글 같은 것 같은	
41070 Structural Wall for Chemical & Oil Store	40 14SEP10 01NOV10 10		
41080 Top Slab for Chemical & Oil Store	20 250CT10 01NOV10 10		
41090 Conc. Plinth at CHPG Stage I/II (VO64)	120 07FEB12 07FEB13 10		Conc. Plinth at CHPG Stage I/II (VO64)
41100 Conc. Plinth at Waste Burner (VO60)	120 07FEB12 260CT12 10		Conc. Plinth at Waste Burner (VO60)
Modification / Removal Works			
42010 Removal of Chemical Waste Room	30 23JUL10 24JUL10 10	I Removal of Chemical Waste Room	
42020 Removal of Flower Bed	20 12JUL10 280CT10 10		
42030 Removal of Waste Bio-gas Burner at Stage I/I	30 20FEB14 21MAR14 9d		Removal of Waste Bio-gas Burner at Stage
42040 Removal of Chimney & Associated RC Structure	60 28AUG13 09SEP13 10		Removal of Chimney & Associated RC Structure
42050 Removal of Storage Facilities	30 29AUG12 12SEP12 10	-	→■ Removal of Storage Facilities
42060 Structures for RO Plant (VO97)	120 09NOV12 29JUL13 10		Structures for RO Plant (VO97)
42070 Shelter for FeCl3 Dosing System	60 11NOV10 15DEC10 10		
42080 Rectification of Shelter for FeCl3 Dosing System	15 10JAN11 22JAN11 10		
42090 Steelwork for FeCl3 Dosing Shelter	30 20DEC10 30APR11 10		
42100 Watertightness Test for FeCl3 Dosing Shelter	16 14MAR11 27MAR11 10		
42110 Removal of FeCl3 Dosing System	60 14APR12 20APR12 10		I of FeCl3 Dosing System
			Date Revision Checked App
			23APR12 D AA TKC
Data data 20DEC13		China Harbour Engineering Co. Ltd.	18JAN13 E AA TKC
Run date 06JAN14		• •	03AUG13 F AA TKC
Page number 6A		TPSTW Stage 5 Phase 2B	06JAN14 G AA TKC
c Primavera Systems, Inc. Start milestone point			
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Act ID	Description	Orig Early Dur Start	Early Finish	Total % Float	2010 FMAMJJASO	2011 N.D.J.F.M.A.M.J.J.A.S.O.N.D.J.F.M.A.M.	2012 2013 2014 20 J J A S O N D J F M A M J J A S O N <u>D</u> J F M A M J J A S O N D J F M A
42120 N	Aodifi of Central Blg Complex (VO43)	770 10NOV11		0 88			Modifi of Central Big Complex (VO43)
	Addification of SAS Thickening House (VO53)	120 14DEC12		100			Modification of SAS Thickening House (VO53)
	Aodi. of Primary Sludge Gravity Thickener (VO02)	60 22DEC10	12NOV12	100		↓	Modi. of Primary Sludge Gravity Thickener (VO02)
42150 N	Addification of Filtrate Treatment Plant (VO33)	120 10JAN13	- · · ·	100			Modification of Filtrate Treatment Plant (VO33)
42160 N	Addification of Chlorination House (VO18)	150 07NOV11	19FEB13	100			Modification of Chlorination House (VO18)
	loor Opening at Service Tower Building (16 nos)	30 24OCT11	310CT11	100		Floor Opening at Ser	rvice Tower Building (16 nos)
	Aodi. of Genset Rm at Inlet Works (VO101)	90 02NOV12		100			Modi. of Genset Rm at Inlet Works (VO101)
1	Removable Handrailing at Inlet Works (VO101)	30 29DEC13		62d 0			Removable Handrailing at Inlet Works (VO1
	Covered Walkway @ Sludge Dewatering House (VO94)	100 22DEC12	23AUG13	100			Covered Walkway @ Sludge Dewatering House (VO94)
Children and Chi	ainage Works						
	Road & Drainage Works in Portion A	120 12JUL10	15JUN11	100		Road & Drainage Works in Portion	n A
Variation C			· · · · · · · · · · · · · · · · · · ·				
	dditional Works for FeCl3 Dosing System	100 28APR11		100		Additional Works for FeCI3 E	
	dditional Work at Service Tower Building (VO58)	20 18JAN13		100			Additional Work at Service Tower Building (VO58)
	Puddle at Service Tower Building (VO58)	10 08JAN14		72d 0			Puddle at Service Tower Building (VO58)
	Opening at Service Tower Building (VO58)	35 22FEB14		2d 0			□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
> 	Pipes to Sludge Dewatering House (VO97)	90 20MAY13		100			Pipes to Sludge Dewatering House (VO97)
	Pipes to SAS Thickening House (VO97)	90 12JUN13		100			Pipes to SAS Thickening House (VO97)
	ipes to Sludge Pumping Station (VO97)	105 03JUN13		100			
	ipe to Central Building Complex (VO97)	90 03JUL13	30SEP13	100			Pipe to Central Building Complex (VO97)
ection V of							
Landscapin		1					Section V of Works
	ection V of Works	1254 29JAN10		100			
	ree Survey	60 08MAR10	1	100	Tree Survey		
	ree Transplanting & Felling Tree	90 22APR10		100		Tree Transplanting & Felling Tree	
· · · · · · · · · · · · · · · · · · ·	stablishment Works to Transplanted Tree	365 03NOV10		100		Establishment Work	s to Transplanted Tree
1	andscaping Softworks			10d 92			Landscaping Softworks
3	andscaping works around FC7B ~ FC12B	45 14FEB14		0 0			
-	andscaping works along AT7 & MLC	45 07FEB14		7d 0			Landscaping works along AT7 & MLC
	stablishment Works to Softworks (FC1A~FC10A)	365 12MAR11	11MAR12	100		Establis	hment Works to Softworks (FC1A~FC10A)
	stablishment Works to Softworks (in Stage I/II)	365 14AUG12		100		an an an an the state of the st	Establishment Works to Softworks (in Stage I/II)
	stablishment Works to Other Softworks			10d 0			1 I I I I I I I I I I I I I I I I I I I
	rigation System @circular tanks & UV~RO (VO67)			100			► ■ Irrigation System @circular tanks & UV~RO (VO67)
	rigation System @PSTs & RO Plant (VO67)	45 23MAY13		100			□ Irrigation System @PS is & RO Plant (VO67)
	rigation System @BHT (VO67)	20 110CT13		100			
	reen Roof at Sludge Dewatering System	120 05JAN12		100			Roof at Sludge Dewatering System Roof at Transformer House
	reen Roof at Transformer House	120 05JAN12		100			Roof at Transformer House
	stablishment Works to Green Roof	365 14AUG12		100			B Green Roof at Contractor's Site Office
50120 G Others	reen Roof at Contractor's Site Office	20 28NOV12		100			
	iversion of DN600 Concerts Pine	AE ADDAVAG				sion of DN600 Concrete Pipe	
	iversion of DN600 Concrete Pipe	45 18MAY10	- · · · · · · · · · · · · · · · · · · ·	100		Sion of Divoou Concrete Pipe	Road & Drainage Works next FC11B
	oad & Drainage Works next FC11B & FC12B	55 04FEB14					Road & Drainage Works along AT6 & AT7
	oad & Drainage Works along AT6 & AT7	100 27MAR13		7d 60			Road & Drainage Works along MLC Bay 3
f -	oad & Drainage Works along MLC Bay 3~8	100 25NOV13		46d 60		SSE Cabla Dusting and Decumits	
	able Ducting and Drawpits for FC11B & FC12B	20 18JUL11		100	gan ang ananang kara	Cable Ducting and Drawpits	(1) 你们还是我们的问题,我们的问题,你们的时候,我们的问题,你们的问题。""你们还不能帮助你。""你们还不能帮助你。"你们还不能帮助你们的问题。"你们还不知道。
	able Ducting % CBC & Transformer Hse (16 ducts)	60 03NOV11		100			e Ducting % CBC & Transformer Hse (16 ducts)
	able Ducting % CBC & Transformer Hse (12 ducts)	60 01MAR12		100			Cable Ducting % CBC & Transformer Hise (12 ducts)
	emaining Cable Ducting and Drawpits	350 28MAY12	14JAN14	0 95			
Variation O							□ ┃ ■ Pipe from SBR tank to U2 (VO/92)
	pe from SBR tank to U2 (VO/92)	45 09OCT13		100			Add. DN300 drain @ Ext. of Sludge Dewatering Hse
	dd. DN300 drain @ Ext. of Sludge Dewatering Hse	75 29JUL13	den and the second s	100	·		Pipe from SAS to VC2 (VO87)
	pe from SAS to VC2 (VO87)	90 29JUL13		100			Modi. of RAS Pump Platform Stage 1 (VO114)
	odi. of RAS Pump Platform Stage 1 (VO114)	30 05AUG13	<u> </u>	100			Modi. of RAS Pump Platform Stage 1 (VO114)
	odi of RAS Pump Platform Stage 2 (VO114)	30 29DEC13		2d 0			→ Moder of RAS Pump Platform Stage 2 (VOT
	odi. of RAS Pump Platform Stage 3 (VO114)	30 27FEB14		2d 0			Concrete paving around FC7B ~ FC12B
51170 Co	oncrete paving around FC7B ~ FC12B	30 15JAN14	13FEB14	0 0			
art date	29JAN10 Early bar						Date Revision Checked
nish date	09MAY14 Progress bar						23APR12 D AA 18JAN13 E AA
ita date in date	29DEC13 Critical bar 06JAN14					ır Engineering Co. Ltd.	18JAN13 E AA 03AUG13 F AA
ige number	7A Summary bar				TPSTW	Stage 5 Phase 2B	06JAN14 G AA
	Systems, Inc. Start milestone point						
	Finish milestone point						

APPENDIX B MONITORING REQUIREMENTS

APPENDIX B – MONITORING REQUIREMENTS

Type of Monitoring	Parameter	Frequency	Duration	Location of Measurement
Noise ⁽¹⁾	L _{eq} (30 min.) (0700-1900 hrs. on normal weekdays)	Once per week	30 mins	• NM1 (Outside the corridor of 1/F of Government Staff Quarter)
	1-hour TSP	3 times every six days	1 hour	CAM1 (on flat roof of Government Staff Quarters)
Air	24-hour TSP	Once every six days 24 hours		 CAM2 (on ground within TPSTW and just next to the Printing Centre of Hung Hing Printing Centre) CAM3 (on ground within TPSTW and just next to Talcon Industrial Ltd.)
Landfill Gas	Methane (v/v) Carbon Dioxide (v/v) Oxygen (v/v)	2 times per day	N/A	The Locations where the excavation is 1m depth or more and within the 250m Consultation Zone of Shuen Wan Landfill • FC7B

APPENDIX C ACTION AND LIMIT LEVELS

APPENDIX C – Action and Limit Levels

<u>1-Hour TSP</u>

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)

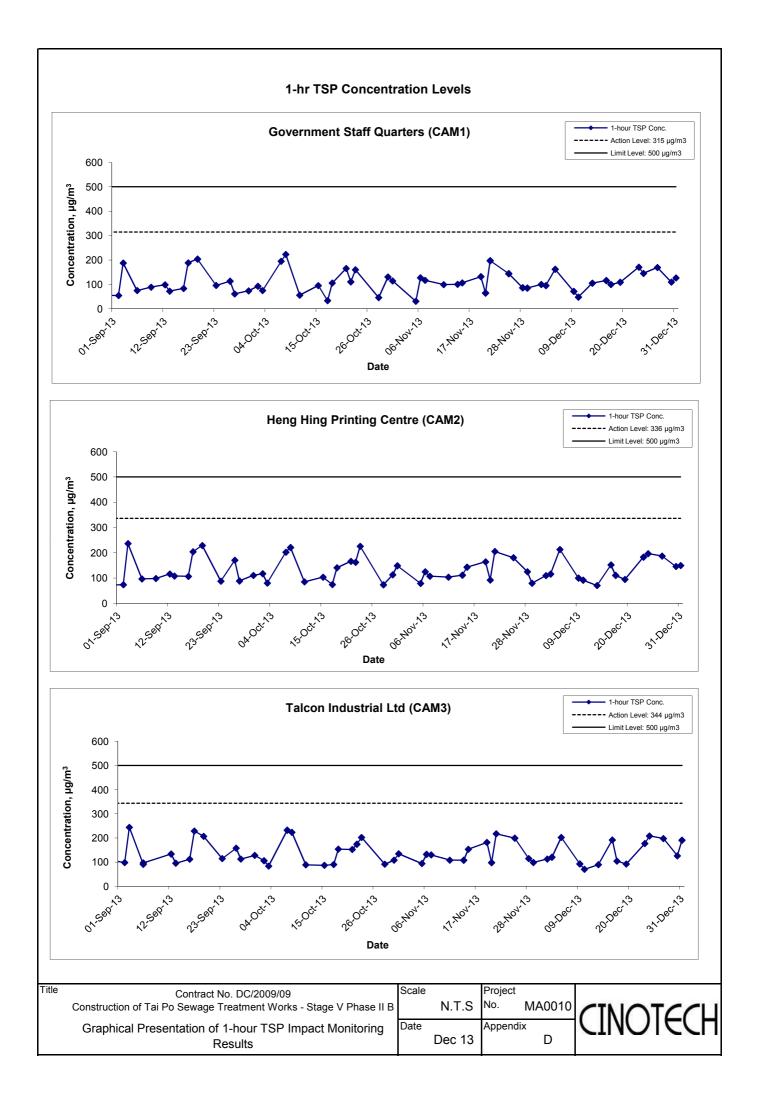
Notes:

* 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.

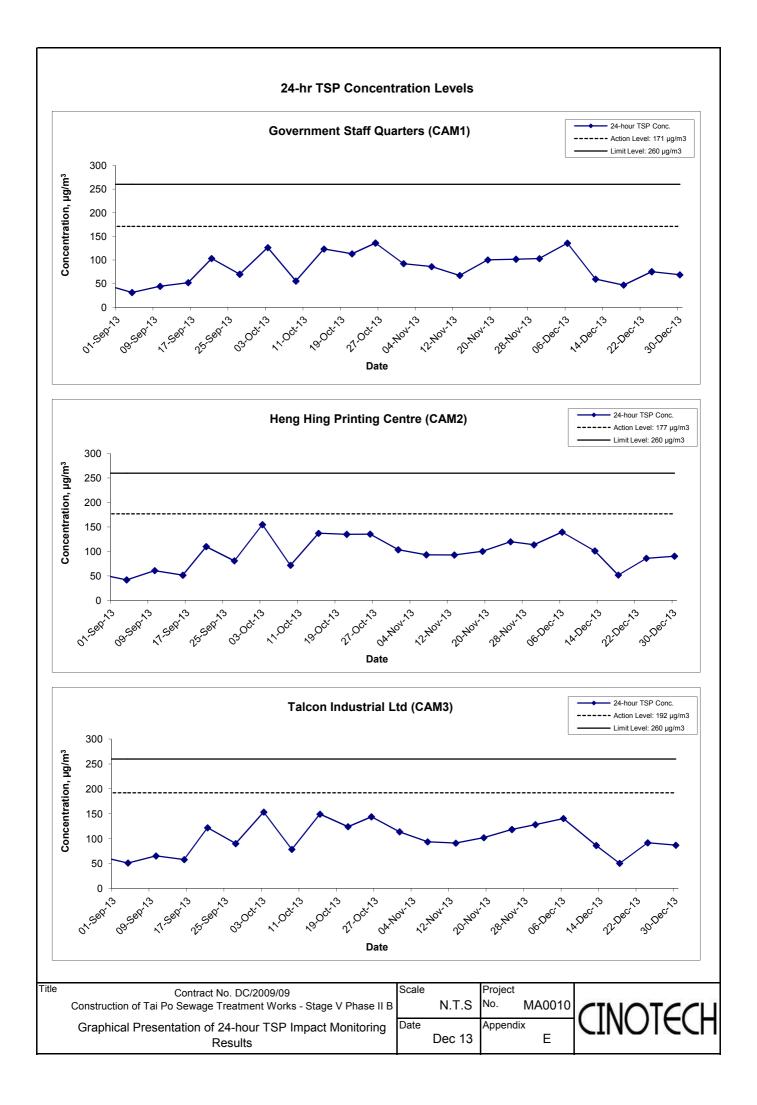
Landfill Gas

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

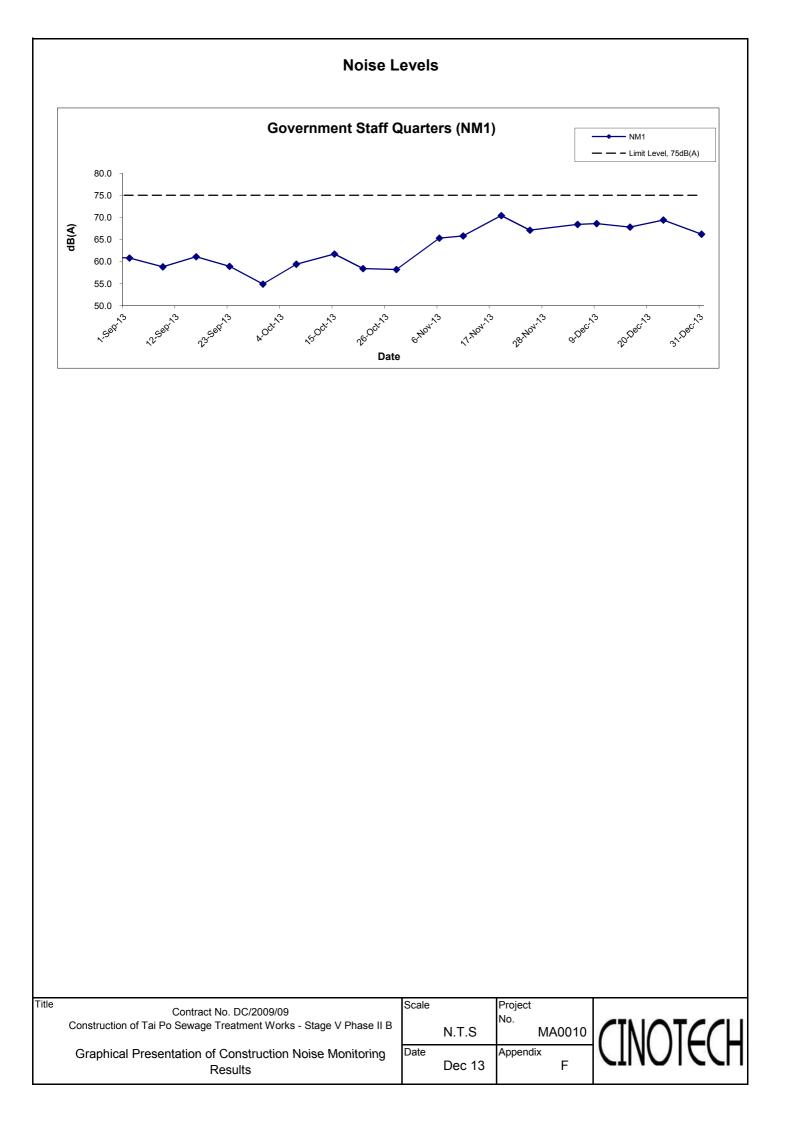
APPENDIX D GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS



APPENDIX E GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS



APPENDIX F GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS



APPENDIX G 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	V					
Noise	Use of quiet PME						
	 Good Site Practice Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program; Mobile plant, if any, should be sited as far from NSRs as possible; Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities. 	√					
Water Quality	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted to minimize the potential water quality impacts from construction site runoff and various construction activities. The recommendation to install perimeter drains to collect site runoff and to properly treat the runoff by settlement tank/treatment system shall apply to all sites including those for mainlaying works. Minimum distances of 100 m should be maintained between the discharge points of construction site runoff and the existing WSD saltwater intake at Tai Po.	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.	√					
	The construction programme should be properly planned to minimize soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimize dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all time. The stockpiles of materials should be placed in the locations away from any stream courses so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work. It is suggested that haul roads should be paved with concrete and the temporary access roads are protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.	√					
	Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment. It is recommended to clean the construction sites on a regular basis.	√					

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

Type of Impact	Recommended Mitigation Measures					
	It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should not be less than 30 m from any watercourse. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis. The construction workers can also make use of the existing toilet facilities within the TPSTW as necessary.					
	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project. Implementation of environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	V				
	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.	V				
	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. 	V				
	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. 	V
	 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 	V
	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.	V

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.					
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 area to be free of landfill gas precautionary measures involved with excavation and piping works shall be included in the Safety Plan Monitoring shall be conducted at the cracks on the ground floor during ground-works construction 	N				
	 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 	V				

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

APPENDIX H SUMMARY OF ENVIRONMENTAL LICENSING AND PERMIT STATUS

APPENDIX H – Summary of Environmental Licensing and Permit Status

Dommit / Licomac No	Valid	Period	Deteile	Statura
Permit / License No.	From To		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	. ,	00/10/10		.
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 effluent: Water Control Zone: Tolo Harbour and Channel Discharge Points: Communal drain for the carriage of surface drainage water	Valid
Waste Disposal (Cher	nical Waste)			
WPN : 5213-727-C2397-16	09/7/10	End of Project	Disposal of Chemical Waste including spent oil, lubricating oil, diesel oil and methanol, surplus paint, thinner	Valid

APPENDIX I WASTE GENERATION IN THE REPORTING QUARTER Name of Department: <u>DSD</u>

Contract No.: DC/2009/09

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

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	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
Month	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastic (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	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 J SUMMARY OF EXCEEDANCE

APPENIDX J – SUMMARY OF EXCEEDANCE

Reporting Period: October to 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 K COMPLAINT LOG

APPENDIX K – COMPLAINT LOG

Reporting Period: October to December 2013

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

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