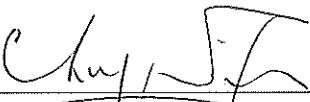


# Jardine Engineering Corporation Limited

Contract No. DE/2009/09  
Supply and Installation of Electrical and  
Mechanical Equipment for Tai Po Sewage  
Treatment Works Stage 5 Phase 2B

## Monthly Environmental Monitoring and Audit Report for March 2015

(Version 2.0)

Certified By   
(Environmental Team Leader)

REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties.

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## TABLE OF CONTENTS

	Page
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
Introduction .....	1
Environmental Monitoring and Audit Works .....	1
Environmental Licenses and Permits .....	1
Key Information in the Reporting Month.....	1
Future Key Issues .....	3
<b>1 INTRODUCTION.....</b>	<b>4</b>
Background .....	4
Construction Programme.....	6
Summary of EM&A Requirements .....	6
<b>2 AIR QUALITY MONITORING .....</b>	<b>8</b>
Monitoring Requirements.....	8
Monitoring Locations .....	8
Monitoring Equipment .....	8
Monitoring Parameters, Frequency and Duration .....	8
Monitoring Methodology and QA/QC Procedure.....	9
Results and Observations .....	10
<b>3 NOISE MONITORING .....</b>	<b>12</b>
Monitoring Requirements.....	12
Monitoring Locations .....	12
Monitoring Equipment .....	12
Monitoring Parameters, Frequency and Duration .....	12
Monitoring Methodology and QA/QC Procedures .....	13
Results and Observations .....	14
<b>4 ENVIRONMENTAL AUDIT.....</b>	<b>15</b>
Site Audits .....	15
Review of Environmental Monitoring Procedures.....	15
Status of Environmental Licensing and Permitting.....	15
Status of Waste Management .....	16
Implementation Status of Environmental Mitigation Measures.....	16
Summary of Exceedances .....	17
Implementation Status of Event Action Plans.....	17
Summary of Complaint and Prosecution.....	17
<b>5 FUTURE KEY ISSUES .....</b>	<b>18</b>
Monitoring Schedule for the Next Month .....	18
Construction Program for the Next Month.....	18
<b>6 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>18</b>
Conclusions .....	19
Recommendations .....	19

## **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 1.1	Key Project Contacts
Table 2.1	Locations for Air Quality Monitoring
Table 2.2	Air 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 3.1	Location of Noise Monitoring Station
Table 3.2	Noise Monitoring Equipment
Table 3.3	Noise Monitoring Parameters, Frequency and Duration
Table 3.4	Summary Table of Noise Monitoring Results during the Reporting Month
Table 4.1	Summary of Environmental Licensing and Permit Status
Table 4.2	Observations 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 45<sup>th</sup> monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract no. DE/2009/09 “Supply and Installation of Electrical and Mechanical Equipment for Tai Po Sewage Treatment Works Stage 5 Phase 2B”. This report documents the findings of EM&A Works conducted in March 2015.
2. The major site activities undertaken in the reporting month included:
  - T&C of E&M equipment for FC No.7B to 10B
  - T&C of RAS Pump No.4 at Stage IV RAS Pumping Station
  - T&C of E&M equipment for Aeration Tank No.5, 6 & 7
  - T&C of new Air Blower No.1 and No.2
  - T&C of Screw Pump No.4 and 8 at Stage IV Inlet Works
  - T&C of new Membrane Filter Press No.5 and ancillary equipment
  - T&C of filtrate treatment plant (SBR)
  - T&C of temporary hot water pipework for Stage IV sludge digestion tanks
  - BS & FS installation for various areas

**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**

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

**Environmental Licenses and Permits**

5. Environmental related licenses/permits granted to the Project include the Environmental Permit (EP) for the Project.

**Key Information in the Reporting Month**

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

**Table II Summary Table for Key Information in the Reporting Month**

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
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 (February 2015)	Submitted to EPD on 17 <sup>th</sup> March 2015 (EP condition 6.6)	N/A	---
Notifications of any summons & prosecutions	0	---	N/A	N/A	---

### **Future Key Issues**

7. Major site activities for the coming two months will include:
  - T&C of E&M equipment for FC No.7B to 10B
  - Replacement work for RAS Pump No.1 and No.3 at Stage IV RAS Pumping Station
  - T&C of E&M equipment for Aeration Tank No. 5, 6 & 7
  - T&C of Screw Pump No.4 and 8 at Stage IV Inlet Works
  - T&C of new Membrane Filter Press No.5 and ancillary equipment
  - T&C of temporary hot water supply system for Stage IV sludge digestion tanks
  - T&C of E&M equipment for new Sludge Digestion Tank No.3
  - BS & FS installation for various areas
  
8. The EM&A programme was terminated on 31<sup>st</sup> March 2015.

## 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 m<sup>3</sup>/day to 130,000 m<sup>3</sup>/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 m<sup>3</sup>/d and 130,000 m<sup>3</sup>/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 m<sup>3</sup>/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 16 May 2011.
- 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 45<sup>th</sup> monthly EM&A report summarizing the EM&A works for the Project in March 2015.

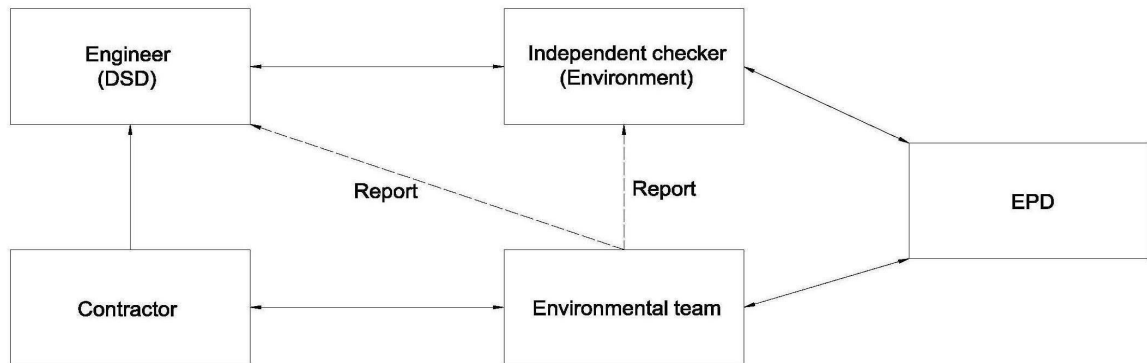
## Project Organizations

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 – Jardine Engineering Corporation Ltd.

1.6 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.7 The Project Organization during Construction Phase



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

**Table 1.1 Key Project Contacts**

Party	Role	Name	Position	Phone No.	Fax No.
DSD	E&M Branch	Mr. TONG Sau Kit	Senior Engineer	2594 7304	2827 8532
		Mr. TSE Ho	Engineer	2660 7638	
Cinotech	Environmental Team	Dr. Priscilla CHOY	ET Leader	2151 2089	3107 1388
		Mr. Harris WONG	Project Coordinator and Audit Team Leader	2151 2098	
		Mr. Henry LEUNG	Monitoring Team Leader	2151 2087	
Arup	Independent Environmental Checker	Mr. Coleman NG	Independent Environmental Checker	2268 3097	2865 6493
		Mr. Edmond PUT	Assistant to Independent Environmental Checker	2528 3031	
JEC	E&M Contractor	Mr. Alex LAW	Project Manager	9312 8659	2887 9090
		Mr. Kim Hung LAU	Site Agent	6393 7548	
		Mr. Brendan CHAN	Environmental Officer	6892 0956	



## **Construction Programme**

1.9 The site activities undertaken in the reporting month were:

- T&C of E&M equipment for FC No.7B to 10B
- T&C of RAS Pump No.4 at Stage IV RAS Pumping Station
- T&C of E&M equipment for Aeration Tank No.5, 6 & 7
- T&C of new Air Blower No.1 and No.2
- T&C of Screw Pump No.4 and 8 at Stage IV Inlet Works
- T&C of new Membrane Filter Press No.5 and ancillary equipment
- T&C of filtrate treatment plant (SBR)
- T&C of temporary hot water pipework for Stage IV sludge digestion tanks
- BS & FS installation for various areas

## **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 6 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.

**Table 2.1 Locations for Air Quality Monitoring**

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.

### Monitoring Equipment

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

**Table 2.2 Air Quality Monitoring Equipment**

Equipment	Model and Make	Qty.
HVS	Graseby GMW 2310 HVS, Model GS-2310105-1, Serial no. 10239 and 0810	2
	Tisch Environmental, Inc.; Model no. TE-5170, Serial no. 1704	1
Calibrator	TISCH.; Model no. TE-5025A Serial no. 0993	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.

**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

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

## 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  $\mu\text{m}$  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  $\pm 3$  °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 m<sup>3</sup>/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 ±5%. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.

## Maintenance/Calibration

2.12 The following maintenance/calibration was required for the HVS:

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

## Results and Observations

2.13 In the reporting month, 1-hr TSP monitoring was carried out as schedule at each designated monitoring station on 13 occasions. 24-hr TSP monitoring was carried out as scheduled at each designated monitoring station on 6 occasions. The monitoring schedule was updated and is shown in **Appendix C**. The weather during the monitoring sessions was mainly sunny and cloudy.

2.14 All measured 1-hr and 24-hr TSP levels were below the Action/Limit Levels. No exceedance was recorded in the reporting month.

2.15 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices D** and **E**, respectively.

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

Parameter	Minimum $\mu\text{g}/\text{m}^3$	Maximum $\mu\text{g}/\text{m}^3$	Average $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
1-hr TSP (CAM1)	130	268	216	315	500
24-hr TSP (CAM1)	56	105	80	171	260
1-hr TSP (CAM2)	89	211	121	336	500
24-hr TSP (CAM2)	28	78	53	177	260
1-hr TSP (CAM3)	109	271	198	344	500
24-hr TSP (CAM3)	52	107	78	192	260

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 3.1 Location 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 3.2 Noise Monitoring Equipment**

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVANTEK - SVAN 957 B&K - 4231	4
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 3.3 Noise Monitoring Parameters, Frequency and Duration**

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

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

## Monitoring Methodology and QA/QC Procedures

### Field Monitoring

3.7 The monitoring procedures are as follows:

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

### Maintenance and Calibration

3.8 Maintenance and Calibration procedures were as follows:

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



### Results and Observations

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

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

Parameter	Minimum Leq(30min) dB(A)	Maximum Leq(30min) dB(A)	Average Leq(30min) dB (A)	Action Level	Limit Level
NM1	58.2	63.1	61.7	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 ENVIRONMENTAL AUDIT

### Site Audits

- 4.1 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**.
- 4.2 Site audits were conducted on 5<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, 23<sup>rd</sup> and 31<sup>st</sup> March 2015 by ET. A joint site audit with the representative with ER, IEC, the Contractor and the ET was carried out on 13<sup>th</sup> March 2015. No site inspection was conducted by EPD during the reporting month. No major environmental deficiencies were observed during the site audits.

### Review of Environmental Monitoring Procedures

- 4.3 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.

### Status of Environmental Licensing and Permitting

- 4.4 All permits/licenses obtained for the Project are summarized in **Table 4.1**.

**Table 4.1 Summary of Environmental Licensing and Permit Status**

Permit / License No.	Valid Period		Details	Status
	From	To		
<b>Environmental Permit (EP)</b>				
EP-265/2007	22/3/2007	N/A	<u>Expansion and upgrading of existing Tai Po Sewage Treatment Works from 100,000 m<sup>3</sup>/day to 130,000 m<sup>3</sup>/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
<b>Registration of Chemical Waste Producer</b>				
5517-727-T3270-01	--	N/A	Major chemical waste types: Spent lubricating oil, spend hydraulic oil, spend cooling oil, surplus paint, spent alkaline electrolyte, spent battery and battery parts containing heavy metals, scrap battery cell containing heavy metals, Nickel and its compounds, spent flammable liquid, spent copper etchant (Ferric chloride), Sodium hypochlorite, polymer, electric and torch bulbs and tubes, alkaline cleaner (spent alkaline solution)	Valid

**Status of Waste Management**

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

**Implementation Status of Environmental Mitigation Measures**

- 4.6 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**.
- 4.7 During site inspections in the reporting month, no non-conformance was identified. In addition, there was no major environmental deficiency being identified on the site audit session on 5<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, 23<sup>th</sup> and 31<sup>st</sup> March 2015. No major environmental deficiencies were observed during the site inspections. The observations and recommendations made during the audit sessions are summarized in **Table 4.2**.

**Table 4.2 Observations and Recommendations of Site Audit**

<b>Parameters</b>	<b>Date</b>	<b>Observations and Recommendations</b>	<b>Follow-up</b>
Water Quality	N/A	N/A	N/A
Air Quality	N/A	N/A	N/A
Noise	N/A	N/A	N/A
Waste/ Chemical Management	N/A	N/A	N/A

**Summary of Exceedances**

- 4.8 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**

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

**Summary of Complaint and Prosecution**

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

## 5 FUTURE KEY ISSUES

### Monitoring Schedule for the Next Month

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

### Construction Program for the Next Month

- 5.2 A tentative construction programme is provided in **Appendix M**. The major construction activities in the coming month will include:
- T&C of E&M equipment for FC No.7B to 10B
  - Replacement work for RAS Pump No.1 and No.3 at Stage IV RAS Pumping Station
  - T&C of E&M equipment for Aeration Tank No. 5, 6 & 7
  - T&C of Screw Pump No.4 and 8 at Stage IV Inlet Works
  - T&C of new Membrane Filter Press No.5 and ancillary equipment
  - T&C of temporary hot water supply system for Stage IV sludge digestion tanks
  - T&C of E&M equipment for new Sludge Digestion Tank No.3
  - BS & FS installation for various areas

## **6 CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

- 6.1 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.
- 6.2 No exceedance of monitoring results was recorded in the reporting month.
- 6.3 There was no environmental complaint, prosecution or notification of summons received.

### **Recommendations**

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

#### ***Waste / Chemical Management***

- Good site practices should be adopted to check for any accumulation of waste materials on site and dispose waste materials at designated areas.
  - Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.
- 6.5 The EM&A programme was terminated on 31<sup>st</sup> March 2015.

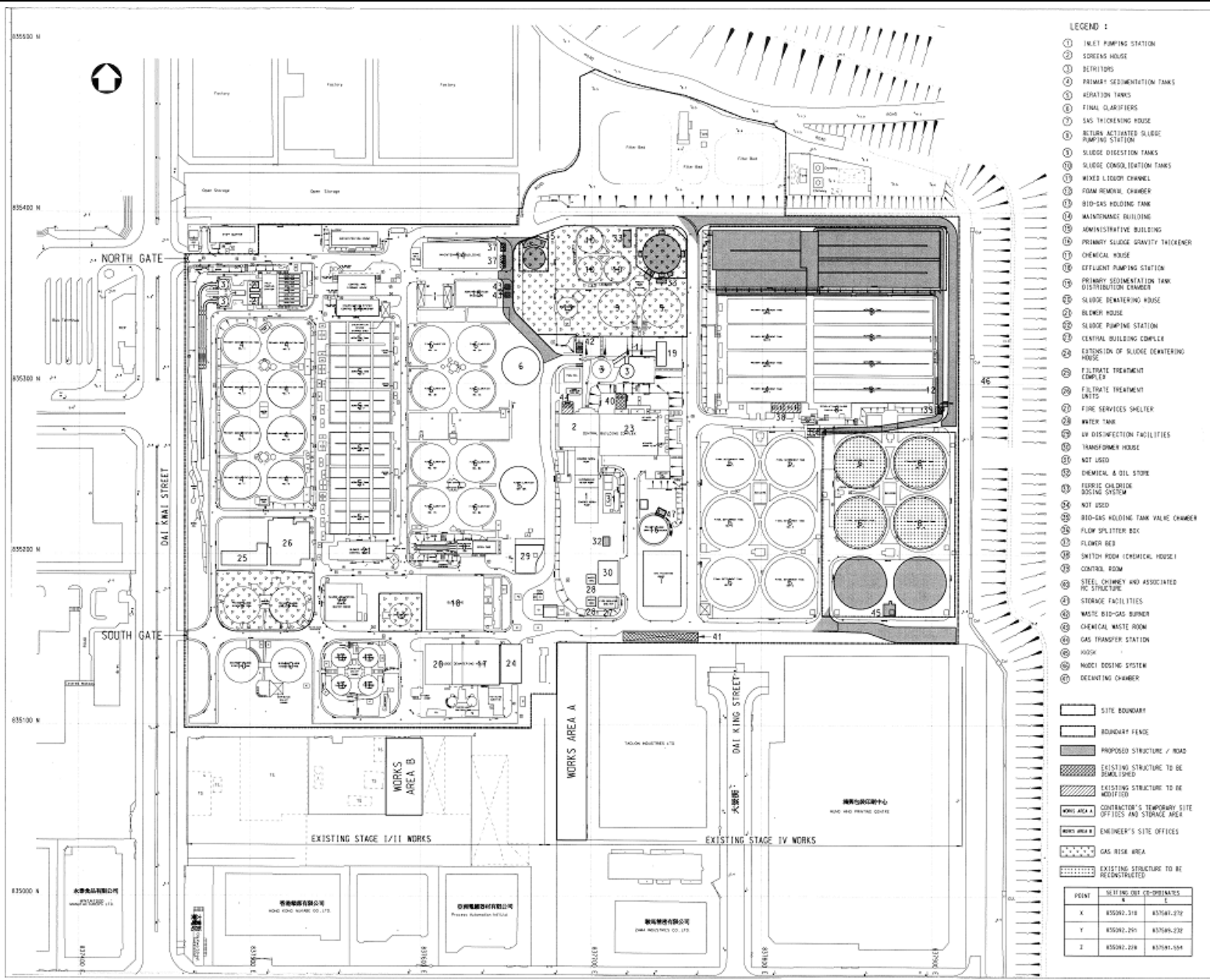
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## FIGURES

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- LEGEND :**
- ① INLET PUMPING STATION
  - ② SCREENS HOUSE
  - ③ DETRITORS
  - ④ PRIMARY SEDIMENTATION TANKS
  - ⑤ AERATION TANKS
  - ⑥ FINAL CLARIFIERS
  - ⑦ GAS THICKENING HOUSE
  - ⑧ RETURN ACTIVATED SLUDGE PUMPING STATION
  - ⑨ SLUDGE DISSOLUTION TANKS
  - ⑩ SLUDGE CONSOLIDATION TANKS
  - ⑪ MIXED LIQUOR CHANNEL
  - ⑫ FOAM REMOVAL CHAMBER
  - ⑬ BIOD-GAS HOLDING TANK
  - ⑭ MAINTENANCE BUILDING
  - ⑮ ADMINISTRATIVE BUILDING
  - ⑯ PRIMARY SLUDGE GRAVITY THICKENER
  - ⑰ CHEMICAL HOUSE
  - ⑱ EFFLUENT PUMPING STATION
  - ⑲ PRIMARY SEDIMENTATION TANK DISTRIBUTION CHANNEL
  - ⑳ SLUDGE DEWATERING HOUSE
  - ㉑ BLOWER HOUSE
  - ㉒ SLUDGE PUMPING STATION
  - ㉓ CENTRAL BUILDING COMPLEX
  - ㉔ EXTENSION OF SLUDGE DEWATERING HOUSE
  - ㉕ FILTRATE TREATMENT CENTER
  - ㉖ FILTRATE TREATMENT UNITS
  - ㉗ FIRE SERVICES SHELTER
  - ㉘ WATER TANK
  - ㉙ UV DISINFECTION FACILITIES
  - ㉚ TRANSFORMER HOUSE
  - ㉛ NOT USED
  - ㉜ CHEMICAL & OIL STORE
  - ㉝ FERRIC CHLORIDE DOSING SYSTEM
  - ㉞ NOT USED
  - ㉟ BIOD-GAS HOLDING TANK VALVE CHAMBER
  - Ⓜ FLOW SPLITTER BOX
  - Ⓝ FLOWMETER
  - Ⓞ SWITCH ROOM (CHEMICAL HOUSE)
  - Ⓟ CONTROL ROOM
  - Ⓠ SITE, CHIMNEY AND ASSOCIATED PG STRUCTURE
  - Ⓡ STORAGE FACILITIES
  - Ⓢ WASTE BIOD-GAS BURNER
  - Ⓣ CHEMICAL WASTE ROOM
  - Ⓤ GAS TRANSFER STATION
  - Ⓥ ROOF
  - Ⓦ HAZARDOUS WASTE STORAGE
  - Ⓧ DEWATERING CHAMBER
- ▭ SITE BOUNDARY
  - ▭ BOUNDARY FENCE
  - ▭ PROPOSED STRUCTURE / ROAD
  - ▭ EXISTING STRUCTURE TO BE DEMOLISHED
  - ▭ EXISTING STRUCTURE TO BE MODIFIED
  - ▭ WORKS AREA A CONTRACTOR'S TEMPORARY SITE OFFICES AND STORAGE AREA
  - ▭ WORKS AREA B ENGINEER'S SITE OFFICES
  - ▭ GAS RISE AREA
  - ▭ EXISTING STRUCTURE TO BE RECONSTRUCTED
- | POINT | SPLITTING POINT CO-ORDINATES |            |
|-------|------------------------------|------------|
|       | X                            | Y          |
| 1     | 835042.218                   | 837047.272 |
| 2     | 835042.265                   | 837049.232 |
| 3     | 835042.218                   | 837047.504 |

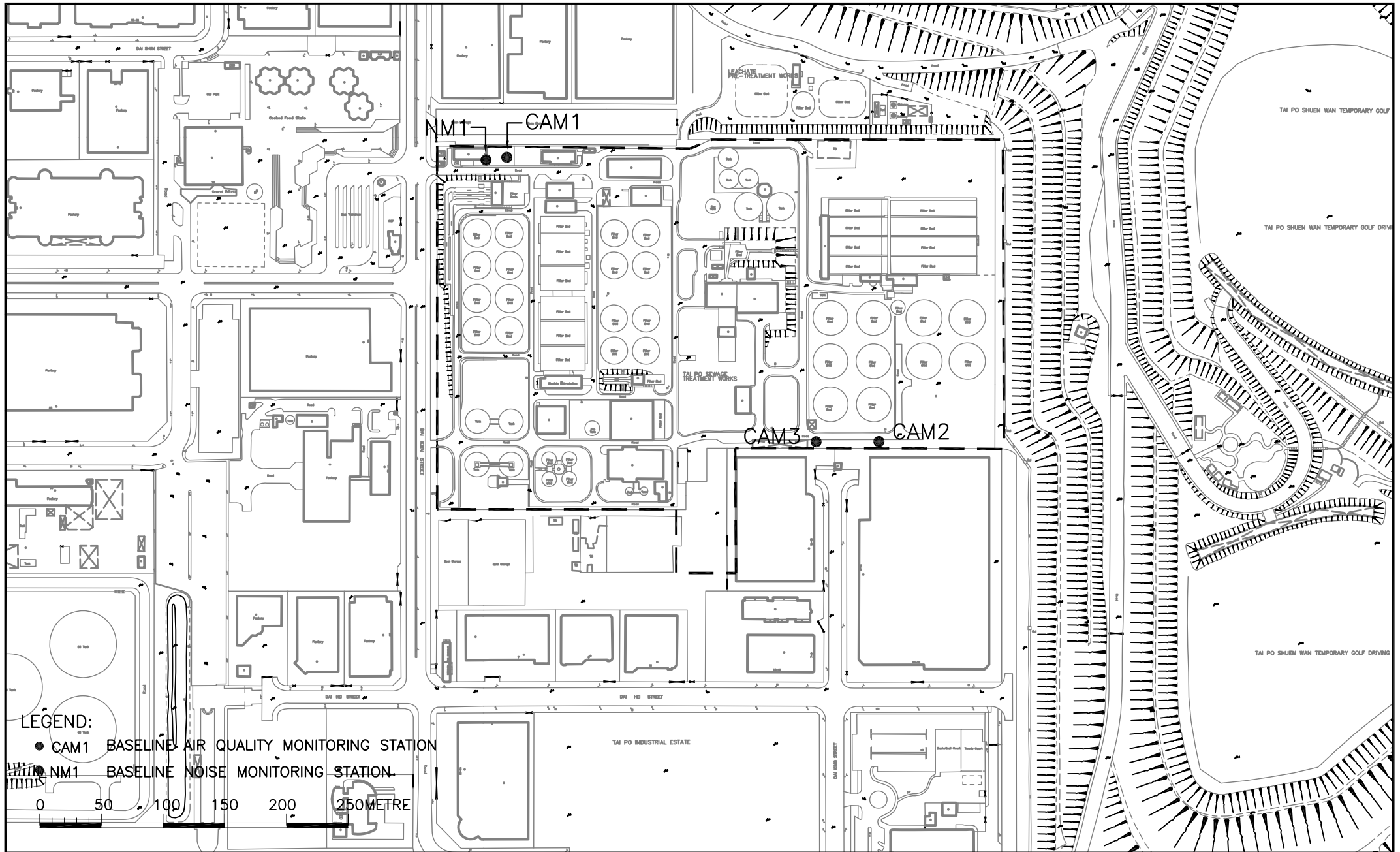
TAI PO SEWAGE TREATMENT WORKS, STAGE V, PHASE IIB

PROJECT SITE LAYOUT PLAN

Scale	N.T.S	Proposa No.	MA10069
Date	Mar-11	Figure	1.1







Tai Po Sewage Treatment Work, Stage V, Phase IIB  
**LOCATIONS OF AIR QUALITY AND NOISE MONITORING STATIONS**

SCALE	A4 1:4000	DATE	2011	
CHECK	IT	DRAWN	TY	
JOB No.	MA10069	DRAWING No.	1.2	REV —

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**APPENDIX A  
ACTION AND LIMIT LEVELS**

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**APPENDIX A – Action and Limit Levels****1-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	315	500
CAM2	336	
CAM3	344	

**24-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
CAM1	171	260
CAM2	177	
CAM3	192	

**Construction Noise**

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days		70* dB(A)
2300-0700 hrs of next day		55* dB(A)

Notes:

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

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**APPENDIX B  
COPIES OF CALIBRATION  
CERTIFICATES**

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## High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0069/37/0001

Station CAMI - Government Staff Quarter  
 Date: 4-Feb-15  
 Equipment No.: A-01-37

Operator: WK  
 Next Due Date: 3-Apr-15  
 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	290.4	Pressure, Pa (mmHg)	769.2

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0582	Intercept, bc	-0.0249
Last Calibration Date:	27-Sep-14	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Sep-15	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	ΔW (HVS), in. of oil	[ΔW x (Pa/760) x (298/Ta)] <sup>1/2</sup> Y-axis
1	11.6	3.47	60.07	7.9	2.86
2	9.8	3.19	55.24	6.5	2.60
3	7.5	2.79	48.38	5.2	2.32
4	5.1	2.30	39.97	3.3	1.85
5	3.4	1.88	32.72	2.1	1.48

By Linear Regression of Y on X

Slope, mw = 0.0504

Intercept, bw = -0.1602

Correlation coefficient\* = 0.9988

\*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; W = (mw x Qstd + bw) <sup>2</sup> x (760 / Pa) x (Ta / 298) = <u>3.88</u>	

Remarks: \_\_\_\_\_

Conducted by: Wk Tang Signature: \_\_\_\_\_  
 Checked by: GT Signature: \_\_\_\_\_

Date: 4/2/15  
 Date: 4 February 2015

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0069/A40/0001

Station CAM2 - Hung Hing Printing Centre Operator: WK  
 Date: 4-Feb-15 Next Due Date: 3-Apr-15  
 Equipment No.: A-01-40 Serial No. 10239

Ambient Condition			
Temperature, Ta (K)	290.8	Pressure, Pa (mmHg)	769

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0582	Intercept, bc	-0.0249
Last Calibration Date:	27-Sep-14	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Sep-15	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	$\Delta H$ (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	$\Delta W$ (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.8	3.50	60.53	7.9	2.86
2	9.6	3.16	54.64	6.4	2.58
3	7.2	2.73	47.38	5.0	2.28
4	5.2	2.32	40.33	3.5	1.91
5	3.3	1.85	32.21	2.1	1.48

By Linear Regression of Y on X

Slope, mw = 0.0486 Intercept, bw : -0.0664  
 Correlation coefficient\* = 0.9989

\*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>3.95</u>	

Remarks: \_\_\_\_\_

Conducted by: Lk, Tang Signature: [Signature] Date: 4/2/15  
 Checked by: [Signature] Signature: [Signature] Date: 4 February 2015

# High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA0069/35/0001

Station CAM3 - Talcon Industrial Ltd  
Date: 4-Feb-15  
Equipment No.: A-01-35

Operator: WK  
Next Due Date: 3-Apr-15  
Serial No. 0810

Ambient Condition			
Temperature, Ta (K)	290.6	Pressure, Pa (mmHg)	769.5

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0582	Intercept, bc	-0.0249
Last Calibration Date:	27-Sep-14	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	26-Sep-15				

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	$\Delta H$ (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	$\Delta W$ (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	11.8	3.50	60.57	7.4	2.77
2	9.7	3.17	54.96	6.1	2.52
3	7.5	2.79	48.38	4.9	2.26
4	5.3	2.35	40.73	3.2	1.82
5	3.2	1.82	31.75	2.0	1.44

By Linear Regression of Y on X

Slope, mw = 0.0467 Intercept, bw = -0.0485  
Correlation coefficient\* = 0.9987

\*If Correlation Coefficient < 0.990, check and recalibrate.

### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point;  $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  3.71

Remarks: \_\_\_\_\_

Conducted by: Wk. Tang Signature: Kwan  
Checked by: Wk Signature: \_\_\_\_\_

Date: 4/2/15  
Date: 4 February 2015

## TEST REPORT

Description	Calibration Orifice	Manufacturer	TISCH
Serial No.	0993	Temperature, Ta (K)	299
Model No.	TE-5025A	Pressure, Pa (mmHg)	761.8
Date	27 September 2014	Equipment No.:	A-04-04

Plate	Diff.Vol (m <sup>3</sup> )	Diff.Time (min)	Diff.Hg (mm)	Diff.H <sub>2</sub> O (in.)
1	1.00	1.4230	3.3	2.00
2	1.00	1.0050	6.5	4.00
3	1.00	0.8950	8.2	5.00
4	1.00	0.8570	9.0	5.50
5	1.00	0.7080	13.0	8.00

### DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9947	0.6990	1.4135
0.9905	0.9856	1.9990
0.9883	1.1042	2.2350
0.9872	1.1519	2.3441
0.9820	1.3870	2.8270

Y axis=  $\text{SQRT}[\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta})]$

Qstd Slope ( m ) = 2.05398

Intercept ( b ) = -0.02487

Coefficient ( r ) = 0.99996

Va	(X axis) Qa	(Y axis)
0.9957	0.6997	0.8860
0.9915	0.9865	1.2530
0.9892	1.1053	1.4009
0.9882	1.1531	1.4693
0.9829	1.3883	1.7720

Y axis=  $\text{SQRT}[\text{H}_2\text{O}(\text{Ta}/\text{Pa})]$

Qa Slope ( m ) = 1.28617

Intercept ( b ) = -0.01559

Coefficient ( r ) = 0.99996

### CALCULATIONS

$V_{\text{std}} = \text{Diff. Vol}[(\text{Pa} - \text{Diff. Hg})/760](298/\text{Ta})$

$Q_{\text{std}} = V_{\text{std}}/\text{Time}$

$V_{\text{a}} = \text{Diff. Vol}[(\text{Pa} - \text{Diff. Hg})/\text{Pa}]$

$Q_{\text{a}} = V_{\text{a}}/\text{Time}$

For subsequent flow rate calculations:

$Q_{\text{std}} = l/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta}))]-b\}$

$Q_{\text{a}} = l/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Ta}/\text{Pa}))]-b\}$

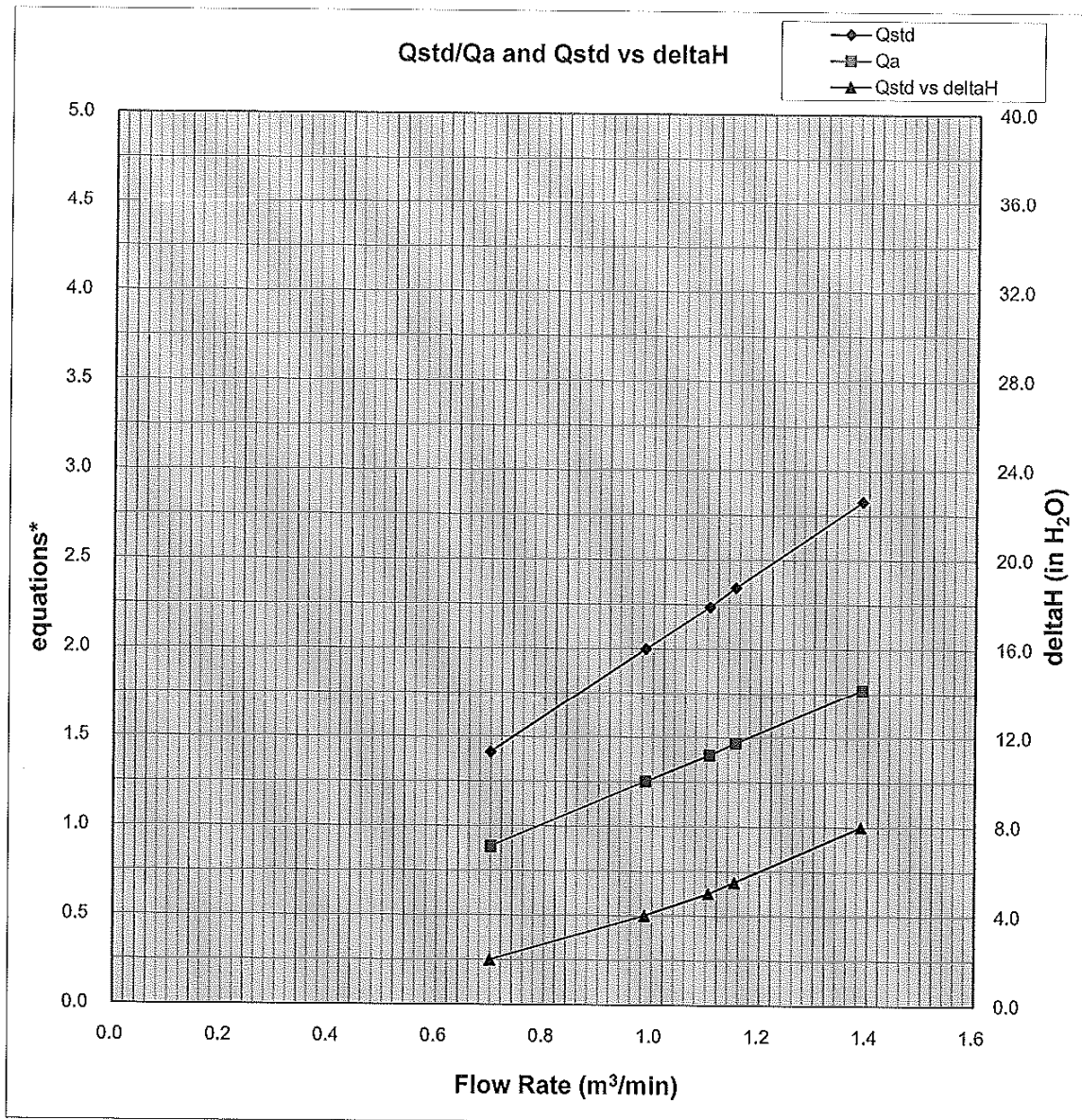
PREPARED AND CHECKED BY:  
For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
Laboratory Manager



**TEST REPORT**



Y-axis equations:

Qstd series:  $\text{SQRT}[\Delta H(\text{Pa}/\text{Pstd})(\text{Tstd}/\text{Ta})]$

Qa series:  $\text{SQRT}[\Delta H(\text{Ta}/\text{Pa})]$

## TEST REPORT

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

Test Report No.:	CA/140426
Date of Issue:	2014-04-27
Date Received:	2014-04-26
Date Tested:	2014-04-26
Date Completed:	2014-04-27
Next Due Date:	2015-04-26

**ATTN:** Mr. W.K Tang

Page: 1 of 1

### 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 : 19 degree Celsius  
Relative Humidity : 60%  
Pressure : 101.4 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

### TEST REPORT

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

Test Report No.:	C/N/140829/1
Date of Issue:	2014-09-01
Date Received:	2014-08-29
Date Tested:	2014-08-29
Date Completed:	2014-09-01
Next Due Date:	2015-08-31

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21455
Microphone No.	: 43730
Equipment No.	: N-08-07

**Test conditions:**

Room Temperature	: 24 degree Celsius
Relative Humidity	: 60%

**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

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

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

Test Report No.:	C/N/140822/3
Date of Issue:	2014-08-25
Date Received:	2014-08-22
Date Tested:	2014-08-22
Date Completed:	2014-08-25
Next Due Date:	2015-08-24

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21459
Microphone No.	: 43676
Equipment No.	: N-08-08

**Test conditions:**

Room Temperature	: 22 degree Celsius
Relative Humidity	: 55%

**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

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

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

Test Report No.:	C/N/140822/1
Date of Issue:	2014-08-25
Date Received:	2014-08-22
Date Tested:	2014-08-22
Date Completed:	2014-08-25
Next Due Date:	2015-08-24

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21460
Microphone No.	: 43679
Equipment No.	: N-08-09

**Test conditions:**

Room Temperature	: 22 degree Celsius
Relative Humidity	: 55%

**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

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**

Laboratory Manager

## TEST REPORT

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

Test Report No.:	C/N/141107/1
Date of Issue:	2014-11-08
Date Received:	2014-11-07
Date Tested:	2014-11-07
Date Completed:	2014-11-08
Ncxt Duc Date:	2015-11-07

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2326353
Equipment No.	: N-02-01

### Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 53 %

### Methodology:

The sound 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

## TEST REPORT

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

Test Report No.:	C/N/141003/2
Date of Issue:	2014-10-04
Date Received:	2014-10-03
Date Tested:	2014-10-03
Date Completed:	2014-10-04
Next Due Date:	2015-10-03

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24791
Equipment No.	: N-09-04

### Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 56%

### 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**

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**Contract No. DE/2009/09 - Construction of Tai Po Sewage Treatment Works - Stage 5 Phase 2B  
Impact Air Quality and Noise Monitoring Schedule for March 2015**

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

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**APPENDIX D  
1-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION**

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## Appendix D - 1-hour TSP Monitoring Results

### Station CAM1

### Government Staff Quarters

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	09:00	Cloudy	290.1	767.5	3.2021	3.2205	0.0184	24343.1	24344.1	1.0	1.22	1.22	1.22	73.2	252
3-Mar-15	15:40	Cloudy	293.8	760.3	3.2994	3.3183	0.0189	24368.1	24369.1	1.0	1.21	1.21	1.21	72.4	261
5-Mar-15	08:10	Cloudy	289.0	766.5	3.3334	3.3506	0.0172	24369.1	24370.1	1.0	1.22	1.22	1.22	73.2	235
9-Mar-15	09:00	Sunny	292.1	767.0	3.3034	3.3210	0.0176	24394.1	24395.1	1.0	1.22	1.21	1.22	72.9	241
10-Mar-15	09:00	Sunny	291.3	770.1	3.1913	3.2060	0.0147	24395.1	24396.1	1.0	1.22	1.22	1.22	73.1	201
13-Mar-15	15:25	Sunny	291.1	766.1	3.3206	3.3354	0.0148	24396.1	24397.1	1.0	1.22	1.22	1.22	73.0	203
16-Mar-15	09:00	Sunny	293.4	765.9	3.2509	3.2635	0.0126	24421.1	24422.1	1.0	1.21	1.21	1.21	72.7	173
17-Mar-15	09:00	Sunny	294.1	763.7	3.3215	3.3309	0.0094	24422.1	24423.1	1.0	1.21	1.21	1.21	72.5	130
19-Mar-15	09:00	Sunny	295.3	763.8	3.2606	3.2800	0.0194	24423.1	24424.1	1.0	1.21	1.21	1.21	72.4	268
23-Mar-15	10:00	Cloudy	293.3	767.5	3.2528	3.2688	0.0160	24448.1	24449.1	1.0	1.21	1.21	1.21	72.8	220
24-Mar-15	09:10	Cloudy	291.5	770.3	3.2900	3.3086	0.0186	24449.1	24450.1	1.0	1.22	1.22	1.22	73.1	254
26-Mar-15	09:00	Cloudy	290.1	771.9	3.3313	3.3480	0.0167	24474.1	24475.1	1.0	1.22	1.22	1.22	73.4	228
31-Mar-15	09:00	Cloudy	296.7	764.5	3.2634	3.2738	0.0104	24475.1	24476.1	1.0	1.20	1.20	1.20	72.3	144
														Min	130
														Max	268
														Average	216

### Station CAM2

### Heng Hing Printing Centre

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	09:00	Cloudy	290.1	767.5	3.1388	3.1473	0.0085	30618.3	30619.3	1.0	1.23	1.22	1.22	73.5	116
3-Mar-15	14:48	Cloudy	292.9	761.0	3.3196	3.3271	0.0075	30643.3	30644.3	1.0	1.21	1.21	1.21	72.8	103
5-Mar-15	08:10	Cloudy	289.0	766.5	3.3179	3.3266	0.0087	30644.3	30645.3	1.0	1.23	1.23	1.23	73.6	118
9-Mar-15	09:00	Sunny	292.1	767.0	3.3010	3.3106	0.0096	30669.3	30670.3	1.0	1.22	1.22	1.22	73.2	131
10-Mar-15	09:00	Sunny	291.3	770.1	3.3034	3.3112	0.0078	30670.3	30671.3	1.0	1.22	1.22	1.22	73.5	106
13-Mar-15	15:38	Sunny	291.1	766.1	3.3012	3.3113	0.0101	30671.3	30672.3	1.0	1.22	1.22	1.22	73.3	138
16-Mar-15	09:00	Sunny	293.4	765.9	3.2720	3.2785	0.0065	30696.3	30697.3	1.0	1.22	1.22	1.22	73.0	89
17-Mar-15	09:00	Sunny	294.1	763.7	3.2939	3.3008	0.0069	30697.3	30698.3	1.0	1.21	1.21	1.21	72.8	95
19-Mar-15	09:00	Sunny	295.3	763.8	3.2143	3.2219	0.0076	30698.3	30699.3	1.0	1.21	1.21	1.21	72.7	105
23-Mar-15	10:10	Cloudy	293.3	767.5	3.2512	3.2666	0.0154	30723.3	30724.3	1.0	1.22	1.22	1.22	73.1	211
24-Mar-15	09:00	Cloudy	291.5	770.3	3.2425	3.2508	0.0083	30724.3	30725.3	1.0	1.22	1.22	1.22	73.4	113
26-Mar-15	09:10	Cloudy	290.1	771.9	3.2969	3.3046	0.0077	30749.3	30750.3	1.0	1.23	1.23	1.23	73.7	104
31-Mar-15	09:00	Cloudy	296.7	764.5	3.1999	3.2103	0.0104	30750.3	30751.3	1.0	1.21	1.21	1.21	72.6	143
														Min	89
														Max	211
														Average	121

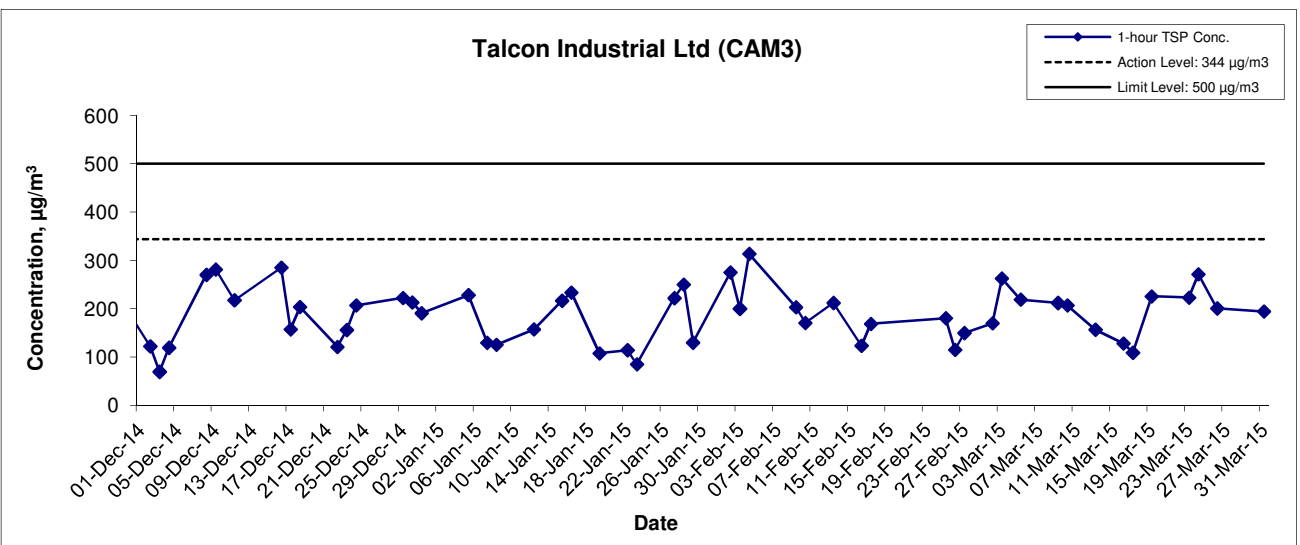
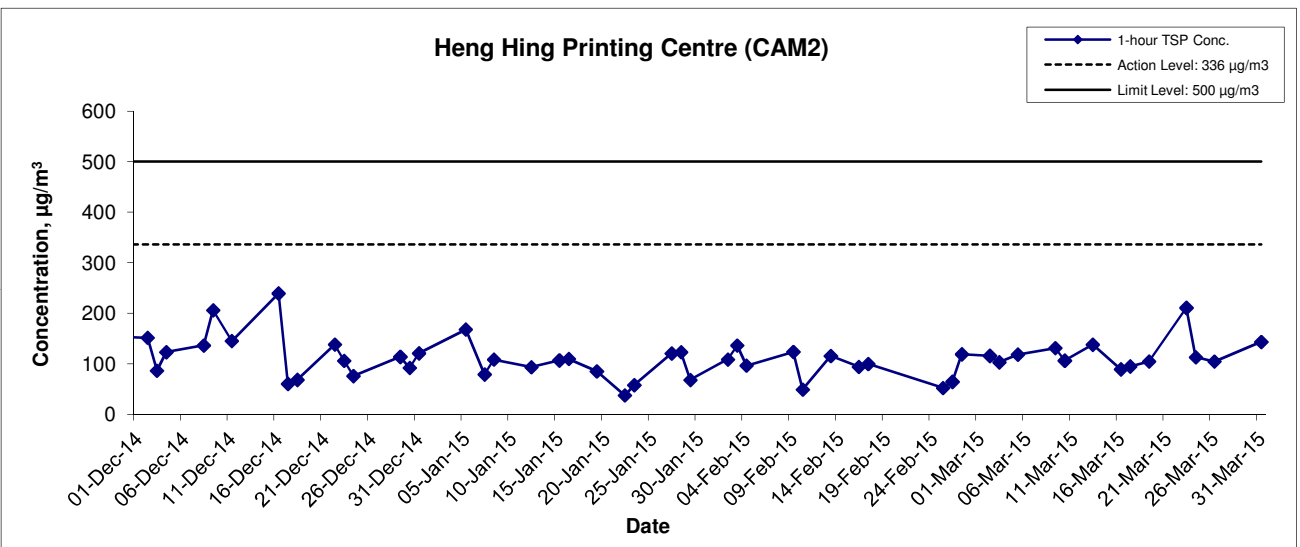
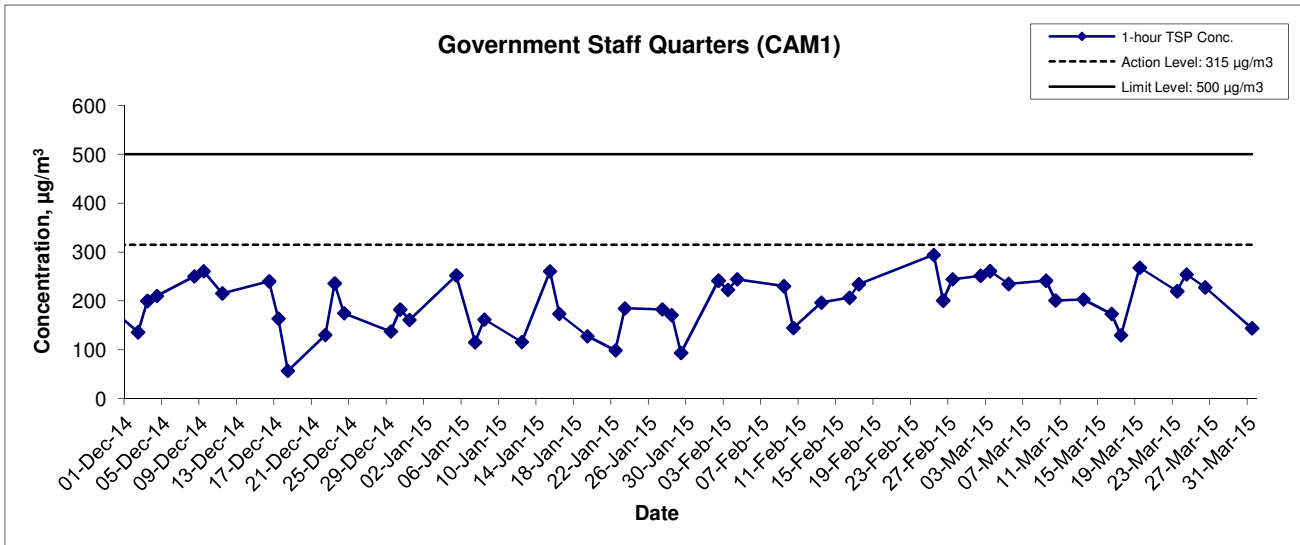
## Appendix D - 1-hour TSP Monitoring Results

Station CAM3

Talcon Industrial Ltd

Date	Sampling Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	09:00	Cloudy	290.1	767.5	3.1950	3.2074	0.0124	24753.9	24754.9	1.0	1.22	1.22	1.22	73.0	170
3-Mar-15	14:45	Cloudy	292.9	761.0	3.2679	3.2869	0.0190	24778.9	24779.9	1.0	1.21	1.21	1.21	72.4	263
5-Mar-15	08:10	Cloudy	289.0	766.5	3.3066	3.3226	0.0160	24779.9	24780.9	1.0	1.22	1.22	1.22	73.1	219
9-Mar-15	09:00	Sunny	292.9	766.6	3.3153	3.3307	0.0154	24804.9	24805.9	1.0	1.21	1.21	1.21	72.6	212
10-Mar-15	09:00	Sunny	291.8	770.5	3.3091	3.3242	0.0151	24805.9	24806.9	1.0	1.22	1.22	1.22	72.9	207
13-Mar-15	15:34	Sunny	291.9	766.3	3.3174	3.3288	0.0114	24806.9	24807.9	1.0	1.21	1.21	1.21	72.7	157
16-Mar-15	09:00	Sunny	293.4	765.9	3.2833	3.2926	0.0093	24831.9	24832.9	1.0	1.21	1.21	1.21	72.5	128
17-Mar-15	09:00	Sunny	294.1	763.7	3.2604	3.2683	0.0079	24832.9	24833.9	1.0	1.21	1.21	1.21	72.3	109
19-Mar-15	09:00	Sunny	295.3	763.8	3.2338	3.2501	0.0163	24833.9	24834.9	1.0	1.20	1.20	1.20	72.2	226
23-Mar-15	10:20	Cloudy	293.3	767.5	3.2886	3.3048	0.0162	24858.9	24859.9	1.0	1.21	1.21	1.21	72.6	223
24-Mar-15	09:00	Cloudy	291.5	770.3	3.2691	3.2889	0.0198	24859.9	24860.9	1.0	1.22	1.22	1.22	73.0	271
26-Mar-15	09:00	Cloudy	290.1	771.9	3.3250	3.3397	0.0147	24884.9	24885.9	1.0	1.22	1.22	1.22	73.2	201
31-Mar-15	09:00	Cloudy	296.7	764.5	3.1663	3.1803	0.0140	24885.9	24886.9	1.0	1.20	1.20	1.20	72.1	194
														Min	109
														Max	271
														Average	198

### 1-hr TSP Concentration Levels



Title Contract No. DE/2009/09  
 Supply and Installation of Electrical and Mechanical Equipment  
 for Tai Po Sewage Treatment Works Stage 5 Phase 2B  
 Graphical Presentation of 1-hour TSP Impact Monitoring  
 Results

Scale N.T.S  
 Date Mar 15

Project No. MA10069  
 Appendix D



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**APPENDIX E  
24-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION**

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## Appendix E - 24-hour TSP Monitoring Results

### Station CAM1

### Government Staff Quarters

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	Cloudy	290.1	764.2	3.2945	3.4780	0.1835	24344.1	24368.1	24.0	1.22	1.22	1.22	1752.3	105
7-Mar-15	Cloudy	289.3	767.6	3.2313	3.3453	0.1140	24370.1	24394.1	24.0	1.22	1.22	1.22	1758.2	65
13-Mar-15	Cloudy	291.0	765.9	3.2954	3.4539	0.1585	24397.1	24421.1	24.0	1.22	1.22	1.22	1751.8	90
19-Mar-15	Cloudy	295.8	763.5	3.2937	3.3915	0.0978	24424.1	24448.1	24.0	1.21	1.21	1.21	1735.9	56
25-Mar-15	Sunny	291.3	771.6	3.2431	3.4096	0.1665	24450.1	24474.1	24.0	1.22	1.22	1.22	1756.9	95
31-Mar-15	Cloudy	296.9	764.1	3.2441	3.3667	0.1226	24476.1	24500.1	24.0	1.20	1.20	1.20	1733.6	71
													Min	56
													Max	105
													Average	80

### Station CAM2

### Heng Hing Printing Centre

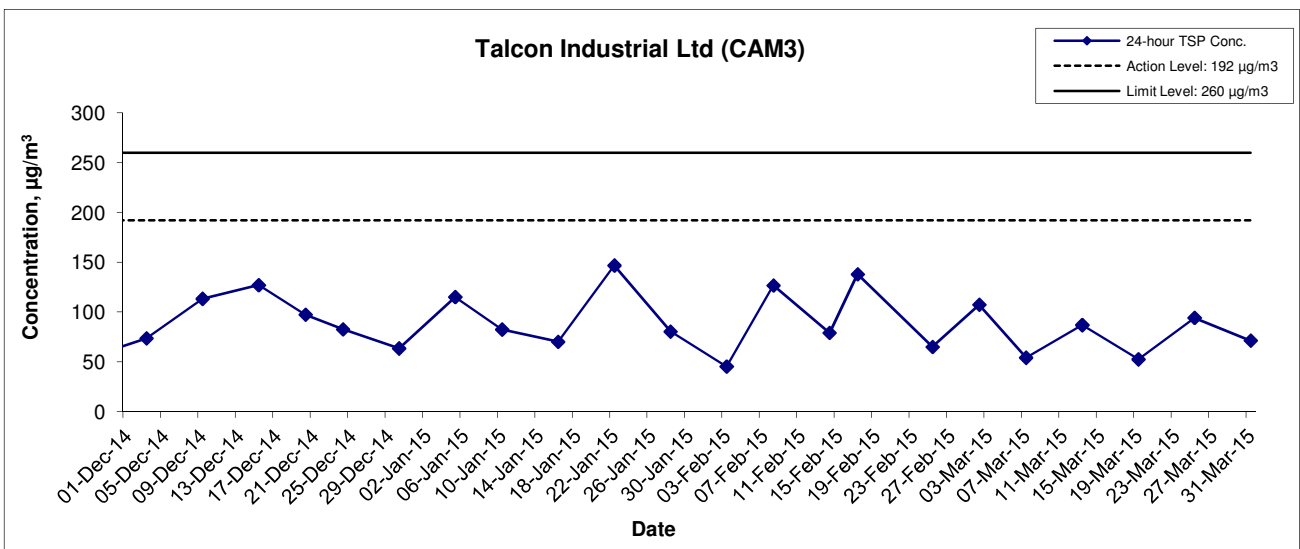
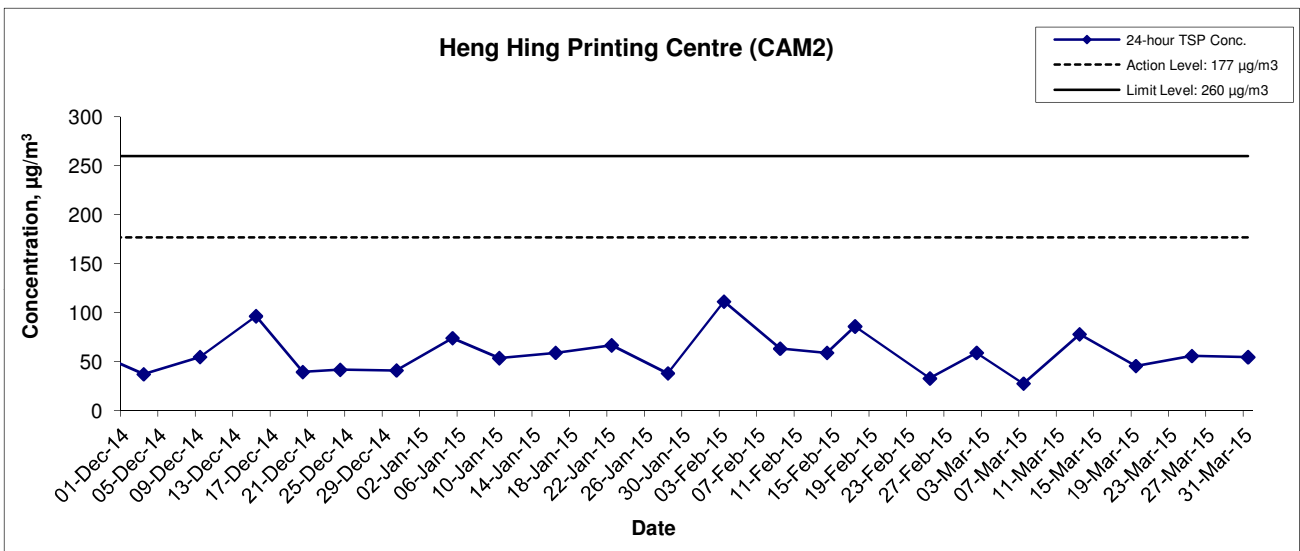
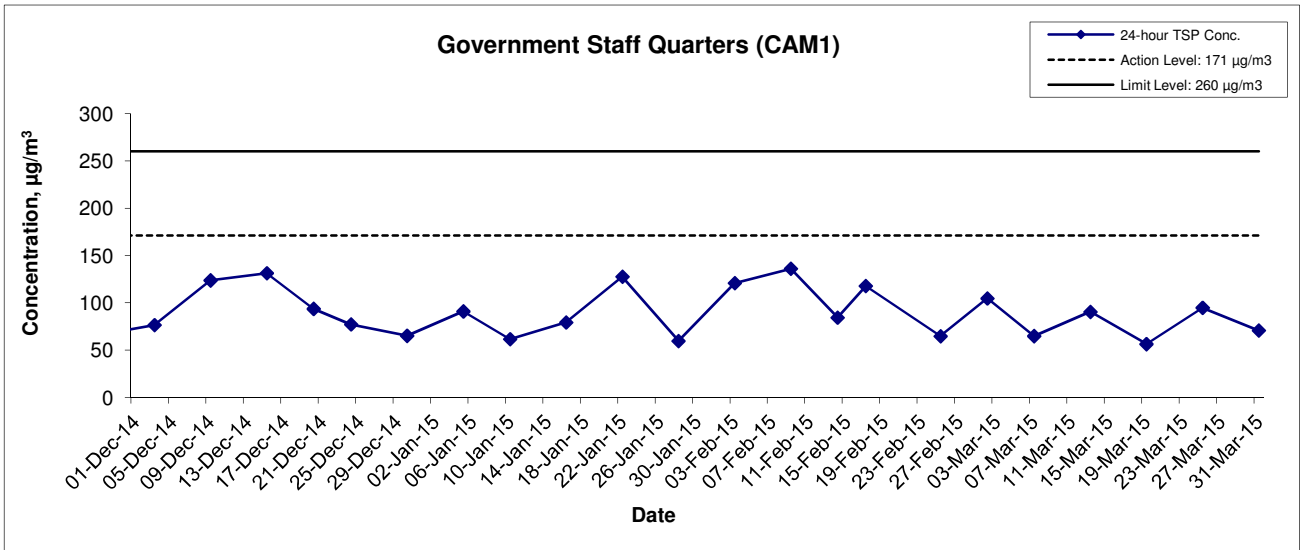
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	Cloudy	290.1	764.2	3.3148	3.4186	0.1038	30619.3	30643.3	24.0	1.22	1.22	1.22	1760.0	59
7-Mar-15	Cloudy	289.3	767.6	3.1886	3.2373	0.0487	30645.3	30669.3	24.0	1.23	1.23	1.23	1766.2	28
13-Mar-15	Cloudy	291.0	765.9	3.2809	3.4179	0.1370	30672.3	30696.3	24.0	1.22	1.22	1.22	1759.5	78
19-Mar-15	Cloudy	295.8	763.5	3.3032	3.3826	0.0794	30699.3	30723.3	24.0	1.21	1.21	1.21	1742.8	46
25-Mar-15	Sunny	291.3	771.6	3.2610	3.3595	0.0985	30725.3	30749.3	24.0	1.23	1.23	1.23	1764.8	56
31-Mar-15	Cloudy	296.9	764.1	3.2261	3.3211	0.0950	30751.3	30775.3	24.0	1.21	1.21	1.21	1740.3	55
													Min	28
													Max	78
													Average	53

### Station CAM3

### Talcon Industrial Ltd

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure (Pa)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
2-Mar-15	Cloudy	290.1	764.2	3.2893	3.4769	0.1876	24754.9	24778.9	24.0	1.21	1.21	1.21	1748.2	107
7-Mar-15	Cloudy	289.3	767.6	3.2409	3.3358	0.0949	24780.9	24804.9	24.0	1.22	1.22	1.22	1754.4	54
13-Mar-15	Cloudy	291.0	765.9	3.3213	3.4731	0.1518	24807.9	24831.9	24.0	1.21	1.21	1.21	1747.7	87
19-Mar-15	Cloudy	295.8	763.5	3.2892	3.3800	0.0908	24834.9	24858.9	24.0	1.20	1.20	1.20	1731.0	52
25-Mar-15	Sunny	291.3	771.6	3.2436	3.4085	0.1649	24860.9	24884.9	24.0	1.22	1.22	1.22	1753.0	94
31-Mar-15	Cloudy	296.9	764.1	3.2530	3.3761	0.1231	24886.9	24910.9	24.0	1.20	1.20	1.20	1728.5	71
													Min	52
													Max	107
													Average	78

## 24-hr TSP Concentration Levels



**Title** Contract No. DE/2009/09  
 Supply and Installation of Electrical and Mechanical Equipment  
 for Tai Po Sewage Treatment Works Stage 5 Phase 2B  
 Graphical Presentation of 24-hour TSP Impact Monitoring  
 Results

**Scale** N.T.S  
**Date** Mar 15

**Project No.** MA10069  
**Appendix** E





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**APPENDIX F  
NOISE MONITORING RESULTS AND  
GRAPHICAL PRESENTATION**

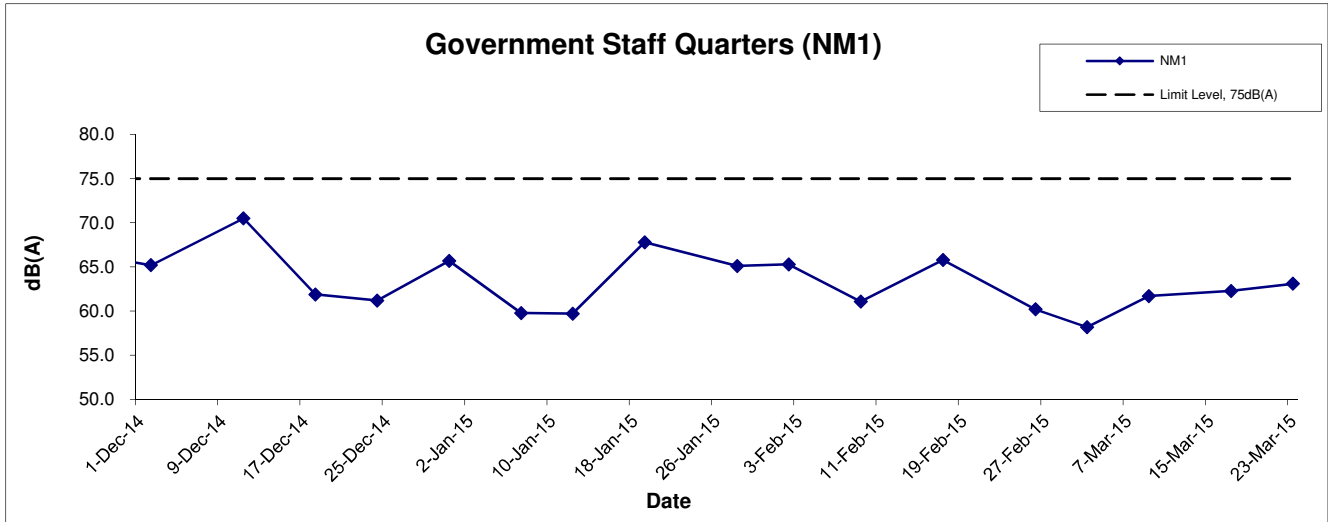
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## Appendix F - Noise Monitoring Results

Location NM1 - Government Staff Quarters					
Date	Time	Weather	dB (A) (30-min)		
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
3-Mar-15	16:05	Cloudy	58.2	59.4	56.5
9-Mar-15	17:00	Sunny	61.7	64.2	57.6
17-Mar-15	13:15	Cloudy	62.3	64.8	57.8
23-Mar-15	9:30	Cloudy	63.1	67.7	57.0
		Average	61.7	64.0	57.2
		Minimum	58.2	59.4	56.5
		Maximum	63.1	67.7	57.8

## Noise Levels



Title Contract No. DE/2009/09 Supply and Installation of Electrical and Mechanical Equipment for Tai Po Sewage Treatment Works - Stage V Phase 2B  Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA0069	
	Date Mar 15	Appendix F	

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**APPENDIX G**  
**SUMMARY OF EXCEEDANCE**

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## **APPENIDX G – SUMMARY OF EXCEEDANCE**

**Reporting Month:** March 2015

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

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

*c) Exceedance Report for Construction Noise (NIL)*

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**APPENDIX H**  
**SITE AUDIT SUMMARY**

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Contract No. DE/2009/09

Supply and Installation of Electrical and Mechanical Equipment for  
Tai Po Sewage Treatment Works Stage 5 Phase 2B

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	150305
Date	5 March 2015 (Thursday)
Time	09:00 – 10:00

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

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Noise</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Remark</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others</b></p> <ul style="list-style-type: none"><li>Follow-up on the previous audit session (Ref. No.150227), no environmental deficiency was observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Harris Wong		5 March 2015
Checked by	Dr. Priscilla Choy		5 March 2015

Contract No. DE/2009/09

Supply and Installation of Electrical and Mechanical Equipment for  
Tai Po Sewage Treatment Works Stage 5 Phase 2B

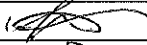

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	150313
Date	13 March 2015 (Friday)
Time	09:30 – 10:30

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

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Noise</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Remark</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others</b></p> <ul style="list-style-type: none"><li>Follow-up on the previous audit session (Ref. No.150305), no environmental deficiency was observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Harris Wong		13 March 2015
Checked by	Dr. Priscilla Choy		13 March 2015



**Supply and Installation of Electrical and Mechanical Equipment for  
Tai Po Sewage Treatment Works Stage 5 Phase 2B**



**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150320
Date	20 March 2015 (Friday)
Time	14:30 – 15:10

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

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part E – Noise</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H – Remark</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on the previous audit session (Ref. No.150313), no environmental deficiency was observed during the site inspection.</li> </ul>	

	Name	Signature	Date
Recorded by	Harris Wong		20 March 2015
Checked by	Dr. Priscilla Choy		20 March 2015

Contract No. DE/2009/09

**Supply and Installation of Electrical and Mechanical Equipment for  
Tai Po Sewage Treatment Works Stage 5 Phase 2B**

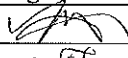

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150323
Date	23 March 2015 (Monday)
Time	9:30 – 10:30

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

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Noise</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Remark</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others</b></p> <ul style="list-style-type: none"><li>• Follow-up on the previous audit session (Ref. No.150320), no environmental deficiency was observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Harris Wong		23 March 2015
Checked by	Dr. Priscilla Choy		23 March 2015

Contract No. DE/2009/09

**Supply and Installation of Electrical and Mechanical Equipment for  
Tai Po Sewage Treatment Works Stage 5 Phase 2B**

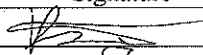

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150331
Date	31 March 2015 (Tuesday)
Time	15:00 – 16:00

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

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Noise</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Remark</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others</b></p> <ul style="list-style-type: none"><li>• Follow-up on the previous audit session (Ref. No.150323), no environmental deficiency was observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Victor Wong		31 March 2015
Checked by	Dr. Priscilla Choy		31 March 2015

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**APPENDIX I**  
**EVENT ACTION PLANS**

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

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>ACTION LEVEL</b>				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor’s working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IC(E) and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor’s working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
<b>LIMIT LEVEL</b>				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor, IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor’s working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor’s working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor’s remedial actions and keep IC(E), EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor’s remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. 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	ACTION			
	ET	IEC	ER	CONTRACTOR
<b><i>ACTION LEVEL</i></b>	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analyzed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
<b><i>LIMIT LEVEL</i></b>	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor’s working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor’s remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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**APPENDIX J  
UPDATED ENVIRONMENTAL  
MITIGATION IMPLEMENTATION  
SCHEDULE**

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

Type of Impact	Recommended Mitigation Measures	Status
<i>Air Quality</i>	Dust mitigation measures stipulated in <i>the Air Pollution Control (Construction Dust) Regulation</i> shall be incorporated to control dust emission. Notice shall be given to authority prior to commencing of work	√
<i>Noise</i>	Use of quiet PME	N/A
	Good Site Practice <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program;</li> <li>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program;</li> <li>• Mobile plant, if any, should be sited as far from NSRs as possible;</li> <li>• 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;</li> <li>• 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</li> <li>• Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	√
<i>Water Quality</i>	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted to minimize the potential water quality impacts from construction site runoff and various construction activities. The recommendation to install perimeter drains to collect site runoff and to properly treat the runoff by settlement tank/treatment system shall apply to all sites including those for mainlaying works. Minimum distances of 100 m should be maintained between the discharge points of construction site runoff and the existing WSD saltwater intake at Tai Po.	√
	A discharge licence needs to be applied from EPD for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies with all the standards listed in the TM. Reuse and recycling of the treated effluent can minimize water consumption and reduce the effluent discharge volume. The beneficial uses of the treated effluent may include dust suppression, wheel washing and general cleaning. Monitoring of the discharge quality of treated effluent should be part of the Environmental Monitoring and Audit (EM&A) programme. Detailed effluent sampling programme for water quality control during construction phase should be submitted to EPD, AFCD and WSD for approval prior to commencement of the construction works.	N/A
	The construction programme should be properly planned to minimize soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimize dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all time. The stockpiles of materials should be placed in the locations away from any stream courses so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work. It is suggested that haul roads should be paved with concrete and the temporary access roads are protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.	√
	Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from dropping into the nearby environment. It is recommended to clean the construction sites on a regular basis.	√



Type of Impact	Recommended Mitigation Measures	Status
	It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should not be less than 30 m from any watercourse. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis. The construction workers can also make use of the existing toilet facilities within the TPSTW as necessary.	√
	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project. Implementation of environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	√
	It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√
	Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken with the areas appropriately equipped to control these discharges.	√
	<p>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:</p> <ul style="list-style-type: none"> <li>• Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport</li> <li>• Chemical waste containers should be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents.</li> <li>• Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>	√
	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
<b>Waste Management</b>	<p>Good site practices during the construction activities include: □</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Training of site personnel in proper waste management and chemical waste handling procedures.</li> <li>• Provision of sufficient waste disposal points and regular collection for disposal.</li> <li>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.</li> <li>• Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.</li> <li>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.</li> <li>• 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.</li> <li>• In order to monitor the disposal of C&amp;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.</li> <li>• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed.</li> </ul>	√
	<p>Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Any unused chemicals or those with remaining functional capacity shall be recycled.</li> <li>• Maximize the use of reusable steel formwork to reduce the amount of C&amp;D material.</li> <li>• Prior to disposal of C&amp;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.</li> <li>• Proper storage and site practices to minimize the potential for damage or contamination of construction materials.</li> <li>• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.</li> <li>• Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering</li> </ul>	√
	<p><i>General Refuse</i> General refuse shall be stored in enclosed bins or compaction units separate from C&amp;D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&amp;D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material.</p>	√
	<p><i>Construction &amp; Demolition (C&amp;D) Material</i> C&amp;D material generated from the site formation and demolition works shall be sorted on-site into inert C&amp;D material (i.e. public fill) and C&amp;D waste. In order to minimise the impact resulting from collection and transportation of C&amp;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&amp;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&amp;D material and to facilitate the sorting process.</p>	√

Type of Impact	Recommended Mitigation Measures	Status
	<p><i>Bentonite Slurry</i>                      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.</p>	<p>N/A</p>

**Note:**

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

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**APPENDIX K  
WASTE GENERATION IN THE  
REPORTING MONTH**

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Name of Department: Drainage Services Department

Contract No. : DE/2009/09

**Monthly Summary - Waste Flow Table for 2015**

Month	Annual Quantities of Inert C&D Materials Generated Monthly						Annual Quantities of C&D Materials Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
Jan	0	0	0	0	0	0	0	0	0	0	3.3
Feb	0	0	0	0	0	0	0	0	0	0	1.7
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr											
May											
June											
July											
Aug											
Sept											
Oct											
Nov											
Dec											
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5.0</b>

Forecast of Total Quantities of C&D Materials to be Generated from the Contractor										
Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in m <sup>3</sup> )	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
0	20	0	0	20	0	100	100	50	10	500

- Notes:
- (1) The performance targets are given in PS Clause 1.40.8(14).
  - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (PS Clause 1.40.7(4)(b) refers).

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**APPENDIX L  
COMPLAINT LOG**

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**APPENDIX L – COMPLAINT LOG****Reporting Month:** March 2015

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

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

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**APPENDIX M**  
**CONSTRUCTION PROGRAMME**

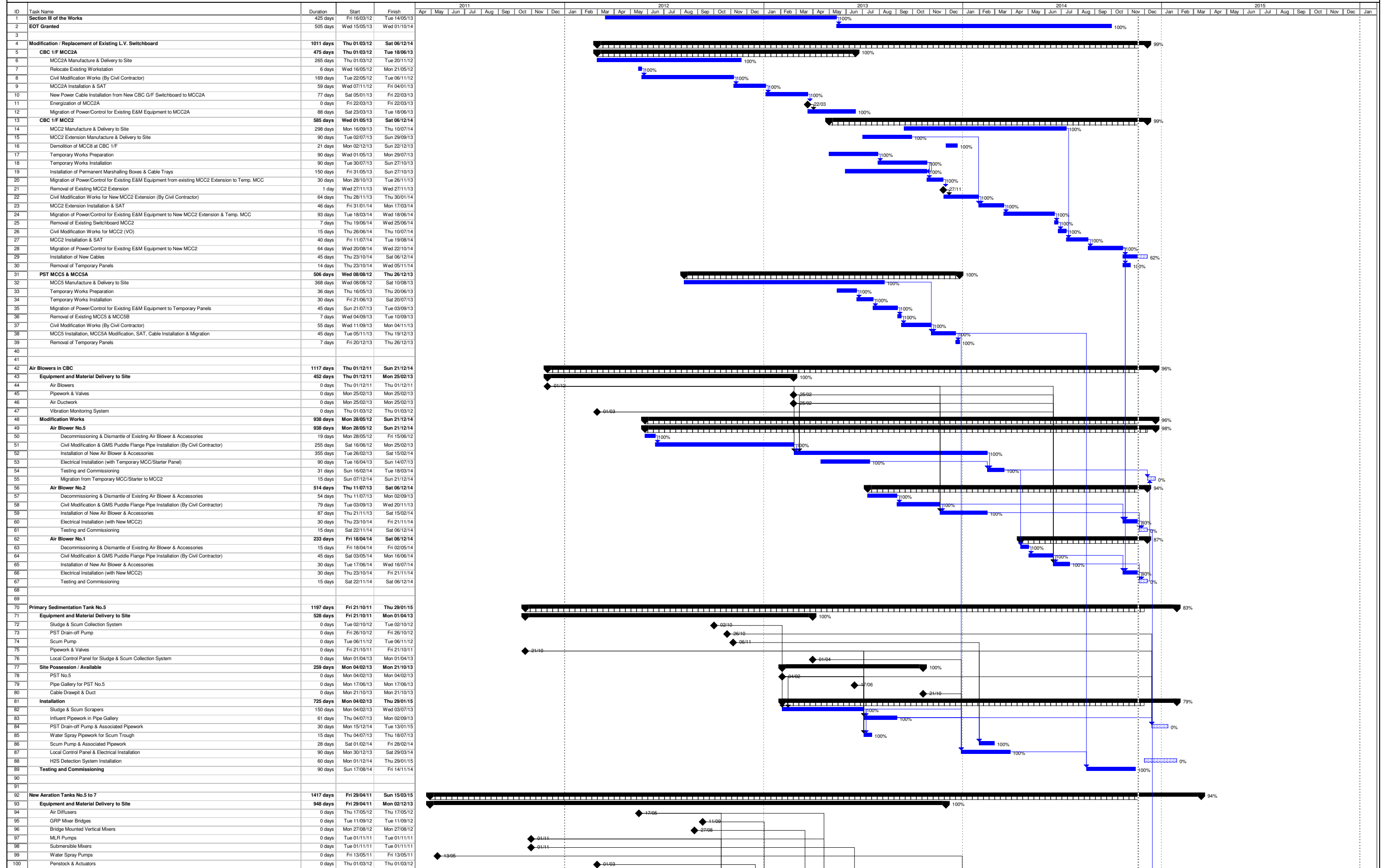
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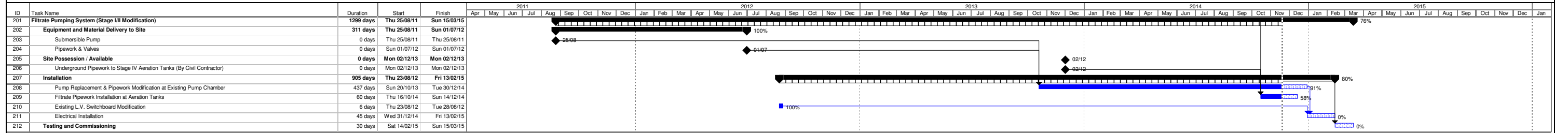


**Section III Works Programme**

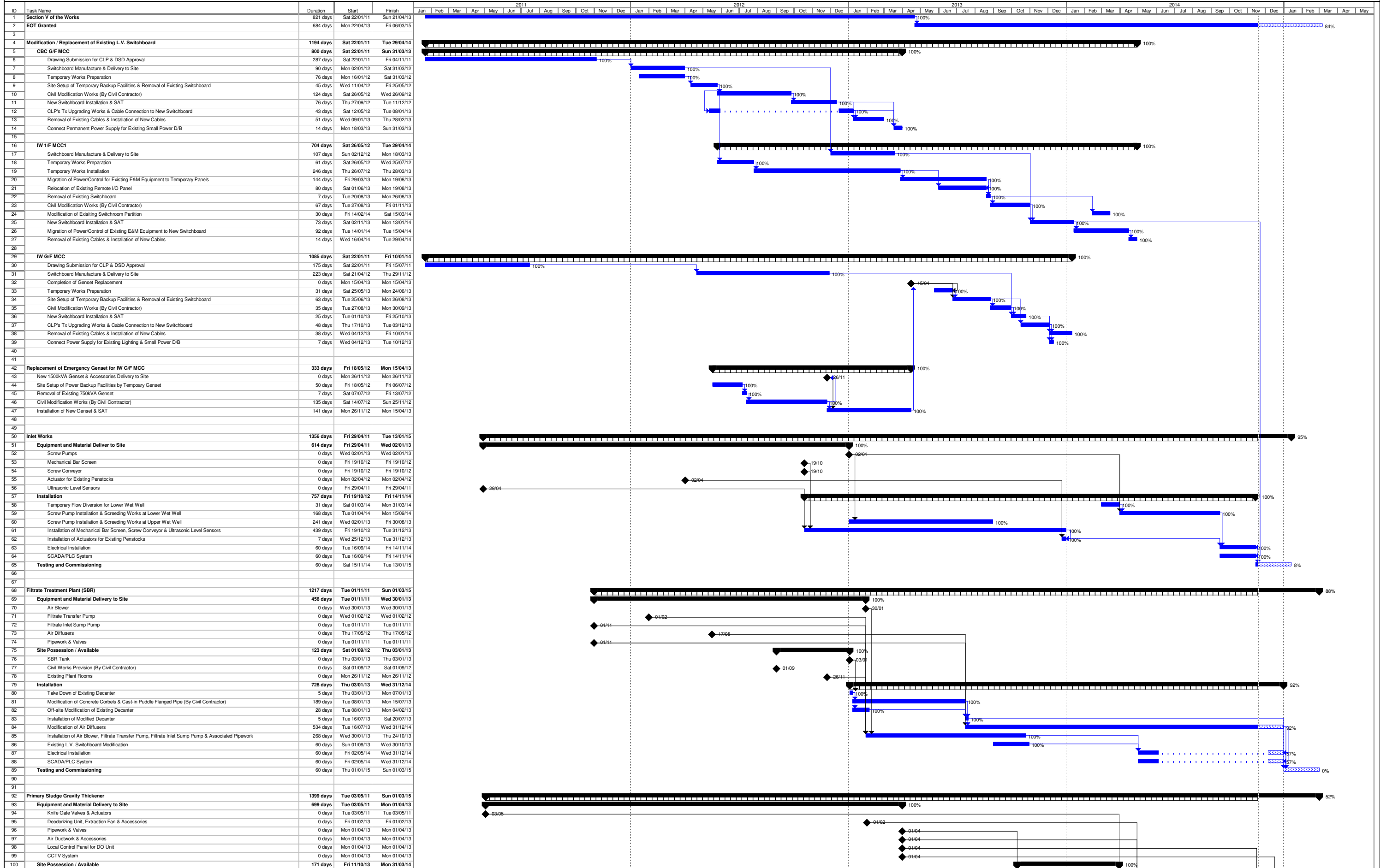




Section III Works Programme

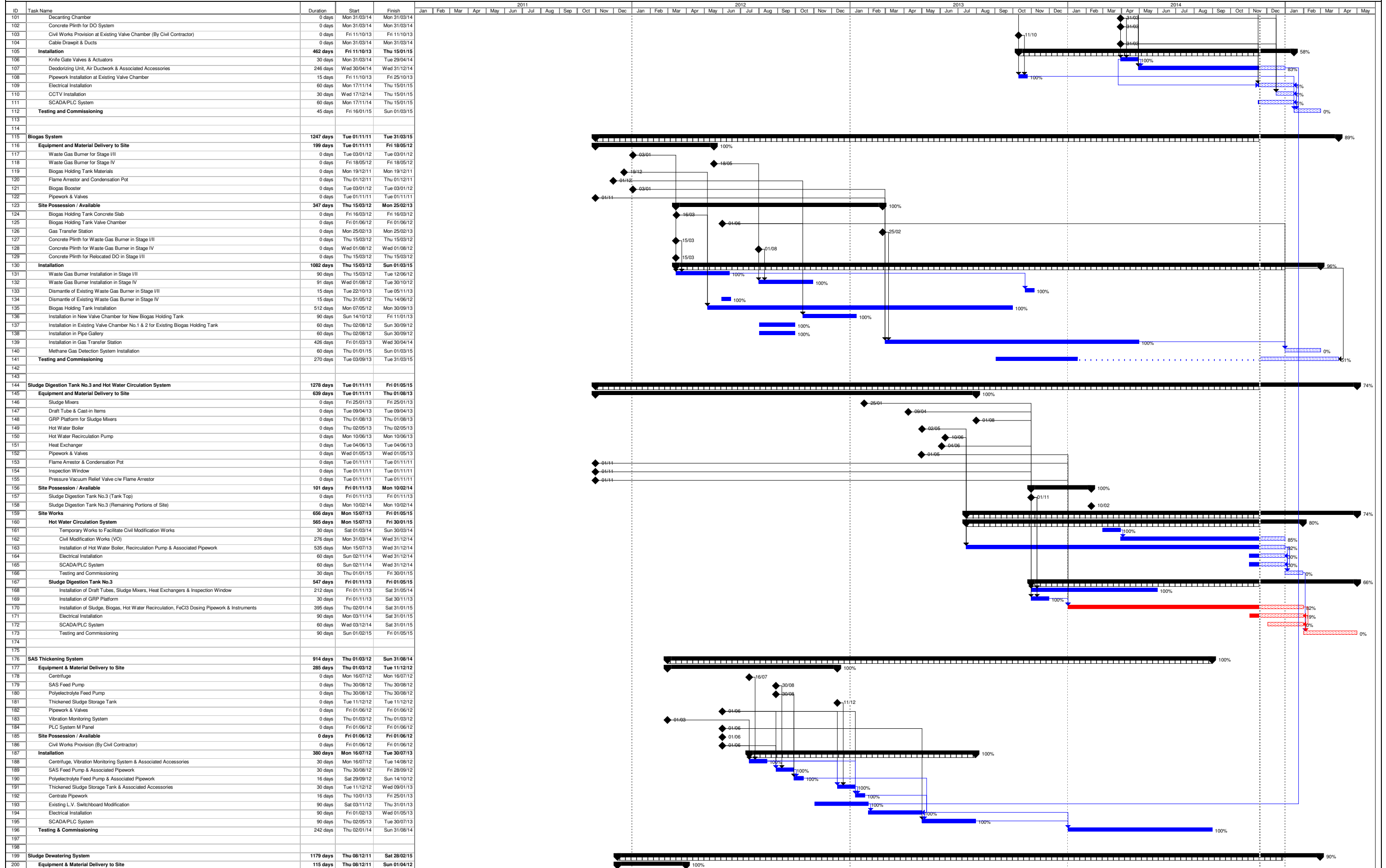


Section V Works Programme



Rev. 9 Date: 19 November 2014	Critical	Critical Progress	Split	Baseline	Baseline Milestone	Summary Progress	Project Summary	External Milestone
	Critical Split	Task	Task Progress	Baseline Split	Milestone	Summary	External Tasks	Deadline

Section V Works Programme



Section V Works Programme

