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**TEST REPORT**

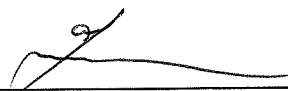
**China Harbour – China State Joint Venture**

**CONTRACT NO. CV/2009/02**  
**HANDLING OF SURPLUS PUBLIC FILL**  
**TSEUNG KWAN O AREA 137 FILL BANK**  
**MONTHLY EM&A REPORT NO.36**  
**(NOVEMBER 2012)**

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14 December 2012

By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited  
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Attention: Mr. C. L. Lau

Dear Mr. Lau,

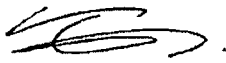
**Re: Contract No. CV/2009/02  
Handling of Surplus Public Fill -- Tseung Kwan O Area 137 Fill Bank  
Monthly EM&A Report No. 36 for November 2012**

Reference is made to your submission of the draft Monthly EM&A Report for November 2012 for the captioned by E-mail on 13 December 2012.

We are pleased to inform you that we have no comment on the captioned report.

Thank you very much for your attention and please do not hesitate to contact our Simon Lam or the undersigned should you have any queries.

Yours sincerely,



Tony Cheng  
Independent Environmental Checker

c.c. CEDD  
CHCSJV

Attn: Mr. Panda Liu / Mr. Jason Wong  
Attn: Mr. Dennis Tang

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## **EXECUTIVE SUMMARY**

This monthly Environmental Monitoring and Audit (EM&A) report No.36 was prepared by ETS-Testconsult Ltd (ET) for the "Contract No: CV/2009/02 – Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank" (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 in November 2012.

### **Site Activities**

As informed by the Contractor, the site activities in this reporting month were as below:

- Removal & delivery of public fill stockpiled material to Mainland
- Operation of the road water lorries and the road sweeper
- Maintenance of haul road within fill bank area
- Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank
- Operation of the tipping hall (A1, A2 & A3)
- Operation at the queuing area for public truck lorries
- Operation of stone crushing plant at TKOFB

### **Environmental Monitoring Progress**

The summary of the monitoring activities in this monitoring month is listed below:

- Noise Monitoring (Day-time): 1 Occasion at 1 designated location
- 24-hour TSP Monitoring: 5 Occasions at 2 designated locations
- 1-hour TSP Monitoring: 15 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 13 Occasions at 2 designated locations
- Weekly-site inspection: 4 Occasions

### **Noise Monitoring**

No exceedance of Action and Limit levels for noise monitoring was recorded in the reporting month.

### **Air Monitoring**

Since the old CREO was closed, dust monitoring station TKO-A2 located at old Combined Reception and Exit Office (CREO) was relocated to the new dust monitoring station TKO-A2a at the new CREO under the proposal by ET, approval by the ER and agreement by IC(E) and effective on 01 February 2011.

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

### **Marine Water Quality Monitoring**

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded in this reporting month.

### **Site Inspection**

Environmental site inspections conducted in this reporting month are presented as follows:

<u>Concerned Parties</u>	<u>Dates of Audit / Inspection</u>
ET Weekly site inspection	07, 14, 23 and 28 November 2012
IEC site inspection	07 and 23 November 2012

In general, performance on environmental mitigation measures implemented was found to be satisfactory in this reporting month. The major findings observed during site inspections are presented in the Section 7.0.

### **Landscape and Visual**

The germination rate on the panels was satisfactory in this reporting month. The Contractor should properly maintain the hydroseeded panels.

### **Environmental Complaints, Notification of summons and successful prosecutions**

No complaints and no notification of summons or successful prosecutions with respect to environmental issues were received in this reporting month.



### **Future Key Issues**

Based on the site inspections and forecast of engineering works in the coming month, key issues to be considered are as follows:

- *Noise and air quality impact due to site works;*
- *Maintain wheel washing facilities properly;*
- *Maintain all drainage and desilting facilities properly;*
- *Use and maintain silt curtain properly;*
- *Clean up the fill material on concrete pavement along the BHA frequently;*
- *Watering, hydroseeding or covering all opening slopes and stockpiles with tarpaulin to avoid wind and water erosion;*
- *Sufficient drip trays for all oil drums / chemical containers;*
- *Implement all necessary preventive measures to avoid oil leakage. In the event an oil leakage happens, the Contractor should properly remove the leaked oil and handle the contaminated soil and all materials using for this cleaning works as chemical waste;*
- *Maintain good site practice and waste management to minimize environmental impacts at the site; and*
- *Follow-up improvements on waste management issues.*



## 1.0 INTRODUCTION

China Harbour – China State Joint Venture (CHCSJV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the “Contract No: CV/2009/02 –Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank” (The Project).

In accordance with the Environmental Permit (No.: EP-134/2002/J) (the EP), an EM&A programme should be implemented in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-060/2002). The EM&A programme for this study as stated in Section 2.3.1 of the EM&A Manual covers the following environmental aspects during the establishment, operation and removal phases of the Fill Bank at Tseung Kwan O Area 137:

- *Fugitive Dust;*
- *Noise generation from onsite activities;*
- *Water Quality; and*
- *Landscape and Visual.*

The EM&A programme requires environmental monitoring for air quality, noise and water quality and environmental site inspections for air quality, noise, water quality, landscape and visual, and waste management. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Monitoring schedules for the reporting month and forthcoming months;*
- *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.*

Baseline monitoring was completed in August and September 2002 by MaterialLab. Action and Limit Levels were established for air and water quality parameters based on the baseline monitoring results.

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 in November 2012.

## 2.0 PROJECT INFORMATION

### 2.1 Scope of the Project

The scale and scope of the Project as stated in the EP include:

- Site clearance;
- Construction of a temporary storm water system;
- Stockpiling of 6 million m<sup>3</sup> of public fill;
- Setting up two barging points: one at the Tseung Kwan O Basin (TKO Basin) and one at the Construction and Demolition Material Sorting Facility (C&DMSF) for transporting the stockpiled public fill by barges;
- Setting up a temporary barging point at the existing Explosive Off-loading Barging Point located in the south-eastern part of Area 137 for the period of May 2004 to December 2004 for transporting the stockpiled public fill by barge;
- Construction and operation of a Construction and Demolition Material Sorting Facility (C&DMSF);
- Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin; and
- Remove the temporary fill bank.

## 2.2 Site Description

Tseung Kwan O Area 137 is located at the southern end of Wan Po Road. In the vicinity of the site are other industrial uses such as SENT landfill, TKO Industrial Estate, etc. Both Island Resort and Fullview Garden are also situated at more than 1.8km from the site. Other existing ASRs and NSRs, including resident developments and schools, are located at a further distance away from TKO Area 137.

## 2.3 Work Programme

Details of work programme are shown in Appendix I G.

## 2.4 Project Organization and Management Structure

The organization chart and lines of communication with respect to the on-site environmental management and monitoring program are shown in Appendix I A.

## 2.5 Contact Details of Key Personnel

The key personnel contact names and telephone numbers are shown in Table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Name of Key Staff	Project Role	Tel. No.	Fax No.
CEDD	Mr. Lawrence NG Mr. LIU Chi Yuen Mr. LIU Kai Chun Mr. WONG Kai Chung	Engineer's Representative	2762 5545	2714 0113
IEC (Materialab) *	Mr Joseph Poon	IEC	2450 8238	2450 6138
IEC (Environ) *	Mr Tony Cheng	IEC	3743 0722	3548 6988
Contractor (CHCSJV)	Mr. Wah Fung Lok	Contractor's Agent	9772 7055	2243 4089
ET (ETL)	Mr C. L. Lau	ET Leader	2946 7791	2695 3944

Remark (\*): Materialab was being as IEC of this Project until 31 January 2010 and was replaced by Environ from 01 February 2010.

## 3.0 WORK PROGRESS IN THIS REPORTING MONTH

As informed by the Contractor, the activities in the reporting month include:

- Removal & delivery of public fill stockpiled material to Mainland
- Operation of the road water lorries and the road sweeper
- Maintenance of haul road within fill bank area
- Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank
- Operation of the tipping hall (A1, A2 & A3)
- Operation at the queuing area for public truck lorries
- Operation of stone crushing plant at TKOFB

## 4.0 AIR QUALITY MONITORING

### 4.1 Monitoring Requirement

TSP levels were monitored in the reporting month in accordance with the EM&A Manual. Table 4.4 shows the Action and Limit Levels for the environmental monitoring works.

### 4.2 Monitoring Equipment

Both 1-hour and 24-hour TSP air quality monitoring was performed using a GMWS2310 High Volume Air Sampler (HVS) located at each of the designated monitoring station. Table 4.1 summarizes the equipment used in the air quality monitoring programme. A copy of the calibration certificates for the HVS and calibrator are attached in Appendix I B1.



Table 4.1 Air Quality Monitoring Equipment

<i>Equipment</i>	<i>Model and Make</i>
<i>HVS</i>	<i>Greasby GMWS2310</i>
<i>Calibrator</i>	<i>Tisch TE-5025A</i>
<i>Wind Data Logger</i>	<i>Davis Weather Monitor II</i>

#### 4.3 Monitoring Parameters, Frequency and Duration

Table 4.2 summarizes the monitoring parameters, monitoring duration and frequencies of air quality monitoring.

Table 4.2 Monitoring parameters, duration, frequency of air quality monitoring

<i>Parameter</i>	<i>Duration</i>	<i>Frequency</i>
<i>24-hr TSP</i>	<i>24 hr</i>	<i>Once every six days</i>
<i>1-hr TSP</i>	<i>1 hr</i>	<i>Three times per day every six days</i>

#### 4.4 Monitoring Locations

Since the old CREO was closed, dust monitoring station TKO-A2 located at old Combined Reception and Exit Office (CREO) was relocated to the new dust monitoring station TKO-A2a at the new CREO under the proposal by ET, approval by the ER and agreement by IC(E) and effective on 01 February 2011.

Table 4.3 tabulates the air quality monitoring locations of this project.

Table 4.3 Air quality monitoring locations

<i>Monitoring station</i>	<i>Location</i>
<i>TKO-A1</i>	<i>Site Egress</i>
<i>TKO-A2a</i>	<i>New CREO</i>

#### 4.5 Monitoring Methodology

##### ***Both 1-hr and 24-hr air quality monitoring (High Volume Sampler)***

##### Instrumentation

High volume sampler, as HVS, (Greasby GMWS2310) complete with appropriate sampling inlets were employed for both 1-hour and 24-hour TSP monitoring. The sampler is 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).

##### Installation

The installation of HVS refers to the requirement stated in EM&A Manual.

##### Operation/Analytical Procedures

Operating/analytical procedures for the operation of HVS are as below:

- Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 0.6m<sup>3</sup>/min and 1.7m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. The flow rate was indicated on the flow rate chart.
- For TSP sampling, fiberglass filters (GA-55) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air 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 air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.



- The programmable timer will be set for a sampling period of 1 hour or 24 hours. 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.).
- After sampling, the filter was transferred from the filter holder of the HVS to a sealed plastic bag and sent to the laboratory for weighting. The elapsed time was also recoded.
- Before weighting, all filters were equilibrated in a desiccator for 24 hour with the temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and the relative humidity (RH)  $<50\% \pm 5\%$ .
- All measurement procedures in Section 2.3 of the EM&A Manual were followed during the reporting month.

#### Maintenance & Calibration

- HVS and their accessories should be maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVS should be calibrated at bi-monthly intervals.

#### **Wind Data Monitoring**

Wind data (wind speed and wind direction) were directly extracted from Tseung Kwan O Station of Hong Kong Observatory. All wind data during this reporting month are shown in Appendix I E.

#### **4.6 Action and Limit Levels**

Table 4.4 shows the Action and Limit levels for 24-hr TSP and 1-hr TSP monitoring.

Table 4.4 Action and Limit Levels for 24-hr TSP and 1-hr TSP

Monitoring Location	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	Action Level	Limit Level	Action Level	Limit Level
TKO-A1	210	260	376	500
TKO-A2 & TKO-A2a *	210	260	376	500

Remark (\*): Since dust monitoring stations TKO-A2 and TKO-A2a are located close to the major dust emission sources and also close to the same sensitive receptor and no significant difference between them on the prevailing meteorological conditions, the baseline data from TKO-A2 can also be valid in the case of TKO-A2a.

#### **4.7 Event-Action Plans**

Please refer to Appendix I F for details.

#### **4.8 Results and Observation**

##### **4.8.1 1-hour and 24-hour TSP Monitoring results**

Monitoring data of both 1-hour and 24-hour TSP monitoring carried out in this reporting month are summarized in Appendix I B2. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting month is shown in Appendix I B3. Wind data included wind speed and wind direction was extracted from Tseung Kwan O Station of Hong Kong Observatory during this reporting month and is presented in Appendix I E. Table 4.5 summarizes 1-hr TSP and 24-hr TSP monitoring results.

Table 4.5 Summary of 1-hr TSP and 24-hr TSP Monitoring Results

Air quality monitoring Stations	Location	Monitoring Period						
		24-hr TSP			1-hr TSP			
		Date	Result ( $\mu\text{g}/\text{m}^3$ )	Exceedance #	Date	Start Time	Result ( $\mu\text{g}/\text{m}^3$ )	Exceedance #
TKO-A1	Site Egress	02/11/12	108	X	02/11/12	10:00	230	X
					05/11/12	15:00	261	X
					07/11/12	16:00	272	X
		08/11/12	105	X	09/11/12	09:05	253	X
					09/11/12	10:10	256	X
					12/11/12	10:40	277	X
		14/11/12	117	X	14/11/12	09:00	249	X
					16/11/12	09:40	259	X
					19/11/12	15:22	212	X
		20/11/12	127	X	21/11/12	14:50	265	X
					21/11/12	15:55	243	X
					23/11/12	13:50	278	X
		26/11/12	115	X	26/11/12	15:00	270	X
					28/11/12	09:40	288	X
					30/11/12	09:00	275	X
TKO-A2a	New CREO	02/11/12	97	X	02/11/12	10:05	191	X
					05/11/12	15:10	215	X
					07/11/12	16:15	219	X
		08/11/12	93	X	09/11/12	09:10	208	X
					09/11/12	10:22	209	X
					12/11/12	10:45	248	X
		14/11/12	90	X	14/11/12	09:15	202	X
					16/11/12	09:45	210	X
					19/11/12	15:31	205	X
		20/11/12	106	X	21/11/12	14:55	213	X
					21/11/12	16:00	178	X
					23/11/12	13:55	189	X
		26/11/12	106	X	26/11/12	15:05	193	X
					28/11/12	09:45	171	X
					30/11/12	09:05	191	X

Remark (\*): L=Limit Level exceedance, A=Action Level exceedance and X=not an exceedance

No exceedance of Action and Limit Level of 1-hr TSP and 24-hour TSP monitoring results was recorded during the reporting month.

#### 4.8.2 Observation

Generally, the Contractor implemented sufficient dust mitigation measures, including operation of the mist spraying systems at the CEDD Combined Reception Office and the site egress area, wheel washing facilities, road dampening by water bowsers and automatic water sprinklers on the main haul roads. Furthermore, hydroseeded slopes on the stockpiling areas was maintained properly in order to prevent dust generation from wind erosion of the exposed surfaces. Other dust sources near TKO Area 137 also included operation of the C&DMSF at the PBR2 Project site, the temporary C&DMSF at Portion K and dumping activities at the SENT Landfill.

### 5.0 Noise Monitoring

#### 5.1 Monitoring Requirements

Noise monitoring was conducted at 1 monitoring station as specified in the approved EM&A Monitoring Proposal for good site practice. The equipment, parameter, frequency, duration, methodology, calibration details, results and observations of the noise monitoring for the reporting month are presented in this section.



## 5.2 Monitoring Equipment

An Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level reading including equivalent continuous sound pressure level ( $L_{eq}$ ) and percentile sound pressure level ( $L_x$ ). It complies with International Electro Technical Commission Publications 651:1979 (Type1) and 804:1985 (Type1), and speed in m/s was used to monitor the wind speed.

Table 5.1 summarizes noise monitoring equipment model being used. A copy of the calibration certificate for noise meter and calibrator are attached in Appendix I C1.

Table 5.1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Cesva SC-20C Sound Level Meter
Calibrator	Rion NC-73 Acoustic Calibrator
Portable Wind Speed Indicator	TSI Model 8340-M Air Velocity Meter

## 5.3 Monitoring Parameters, Duration and Frequency

Duration, frequencies and parameters of noise measurement are presented in Table 5.2.

Table 5.2 Duration, Frequencies and Parameters of Noise Monitoring

Time period	Duration/min	Parameters	Frequency
Day-time: 0700-1900 hrs on normal weekday	30	$L_{eq}$ , $L_{10}$ , $L_{90}$	Once per month

## 5.4 Monitoring Locations

One Noise monitoring was conducted at the noise monitoring location, TKO-N1 as shown in Figure 2 during the reporting month. Table 5.3 describes the location of the monitoring station.

Table 5.3 Noise Monitoring Locations

Monitoring station	Location	Type of Measurement
TKO-N1	Outside site Egress along Wan Po Road	Free Field

## 5.5 Monitoring Procedures and Calibration Details

### Operation/Analysis Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces.
- The battery condition was checked to ensure the correct 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
  - Time measurement : 30 mins
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with a portable wind meter.
- During 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.
- Correction factor of +3dB(A) should be made to the free Field measurements.
- Noise monitoring would be cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind gusts exceeding 10m/s.

### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator are cleaned with soft cloth in quarterly intervals.
- The meter is sent to the supplier or HOKLAS laboratory to check and calibrated in yearly intervals.

## 5.6 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 5.4.

Table 5.4 Action and Limit Levels for noise monitoring

<i>Time Period</i>	<i>Time Period</i>	<i>Action</i>	<i>Limit</i>
<i>Normal hours</i>	<i>0700-1900 hrs on normal weekdays</i>	<i>When one documented complaint is received</i>	<i>75 dB(A)</i>

## 5.7 Event-Action Plans

Please refer to the Appendix I F for details.

## 5.8 Results and Observation

### 5.8.1 Results

Only Day-time noise monitoring was carried out at monitoring station TKO-N1 in this reporting month. The detail of the noise monitoring is provided in Appendix I C2. Graphical presentation of the monitoring result for the reporting month is shown in Appendix I C3. A summary of the monitoring result is presented in Table 5.5.

Table 5.5 Summary of Impact Noise Level

<i>Date</i>	<i>Start Sampling Time (hh:mm)</i>	<i>Noise Level dB (A) *</i>		
		<i>L<sub>eq(30min)</sub></i>	<i>L<sub>10</sub></i>	<i>L<sub>90</sub></i>
<i>07/11/12</i>	<i>09:15</i>	<i>67.4</i>	<i>69.0</i>	<i>62.5</i>

Remark: (\*) : Correction factor of +3dB(A) was added to the measured results due to the free Field measurements.

Since no documented complaints on noise issue were received in this reporting month, no Action Level exceedances were recorded. Besides, no exceedances in Limit Level were recorded according to the result from Day-time monitoring.

### 5.8.2 Observation

The major noise source during the monitoring event was the dump truck traffic. Operation of the Fill Bank was from 08:00 to 21:00 from Monday to Sunday in the reporting month. Whereas the operation hours for barge activities in the TKO Basin was from 08:00 to 23:00. The monitoring result complied with the noise limit of 75dB(A).

## 6.0 MARINE WATER QUALITY MONITORING

### 6.1 Monitoring Requirements

In accordance with the EM&A Manual, impact marine water quality monitoring was conducted three days per week. Measurements were taken at both mid-flood and mid-ebb tides at three depths (i.e. 1m below surface, mid depth and 1m from seabed) at Control Station, C1 and Monitoring Station, M4.

### 6.2 Monitoring Locations

For the Reclamation Project, there were 4 Designated Monitoring Stations and 2 Designated Control Stations specified in the EM&A Manual. Upon the completion of the monitoring programme under Stage 2 reclamation works, the ET started monitoring events at the impact station M4 and the control station C1 from 18 May 2004 onwards. Figure 1 shows the location of the marine water quality monitoring stations. Table 6.1 describes the locations of the monitoring stations in the reporting month.

Table 6.1 Locations of Marine Water Monitoring Stations

Station Description	Code	HK Metric Grid E	HK Metric Grid N
Control Station (Ebb tide)	TKO-C1	844 740.208	815 371.502
Monitoring Station, Tung Lung Chau Fish Culture Zone	TKO-M4	847 741.029	812 977.878

### 6.3 Monitoring Parameters

Monitoring of the marine water quality parameters are listed in Table 6.2.

Table 6.2 Marine Water Quality Monitoring Parameters

In-situ measurement	Laboratory analysis
Depth (m)	Suspended solids (mg/L)
Temperature (°C)	
Dissolved Oxygen (mg/L and % saturation)	
Turbidity (NTU)	
Salinity (ppt)	

### 6.4 Monitoring Frequency

The monitoring frequency of the marine water monitoring is summarized in Table 6.3.

Table 6.3 Monitoring frequency of the marine water

Parameter	Frequency	No. of Location	No. of Depths
Temperate	3 days/week, 2 tides/day	2 (TKO-C1 and TKO-M4)	3 (Surface, mid-depth & bottom)
Salinity			
DO			
Turbidity			
Suspended solids			

### 6.5 Monitoring Methodology and Equipment Used

#### For Location of the monitoring stations

##### **Global Positioning System (GPS)**

A hand-held digital GPS was used to identify the designated monitoring stations prior to water sampling.

#### For Water Depth measurement

##### **Echo Sounder**

A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

#### For In-situ Water Quality Measurement

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals or sometimes longer throughout all stages of the water quality monitoring.

##### **Dissolved Oxygen, Salinity and Temperature Measuring Equipment**

A portable, weatherproof dissolved oxygen & salinity measuring instrument, which complete with cable, sensor and DC power source (e.g. YSI 85 or equivalent) was used for measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200 % saturation;
- a salinity in range 0-40 ppt; and
- a temperature of 0-45 degree Celsius

A membrane electrode with automatic temperature compensation complete with a cable was installed.

### **Turbidity Measurement Instrument**

A portable and weatherproof turbidity meter (HACH model 2100P) was used during impact monitoring. It has a photoelectric sensor capable of measuring turbidity between 0-1000 NTU. Response of the sensor was checked with certified standard Turbidity solutions before the start of measurement.

### **For Water Sampling and Sample Analysis**

In-situ monitoring was carried out at three depths: 1 meter below water surface, at mid-depth and 1 meter above the seabed. If the water depth is less than 6 m, the mid-depth station shall be omitted and if the water depth is below 3 m, only the mid depth station shall be monitored.

### **Water Sampler**

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 liters, was lowered into the water body at the predetermined depth. The both opening ends of the sampler were then closed accordingly by dead weight and water samples were collected.

### **Water Container**

The sample container, made by high-density polythene, was rinsed with a portion of the water sample. The water sample was then transferred to the container, labelled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The water samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

The summary of testing method of testing parameter as recommended by EIA or required by EPD, with the QA/QC results in accordance with the requirement of HOKLAS or international accredited scheme is shown in Table 6.4.

Table 6.4 Summary of testing procedures

<i>Laboratory Analysis</i>	<i>Testing Procedure</i>	<i>Detection Limit</i>
<i>Total suspended solids</i>	<i>In house method based on APHA 19<sup>th</sup> ed 2540D</i>	<i>1.0 mg/L</i>

### **In-situ measurement**

All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter was carried out before the start of measurement.

At each measurement/sampling depth, two consecutive measurements of dissolved oxygen (DO), dissolved oxygen saturation (DOS), turbidity and salinity were taken. For turbidity measurement, the sample was collected by using sampler and then transferred to the cell. The reading of turbidity of the sample was directly recorded from the Turbidimeter (HACH 2100P) after inserting the cell to the Turbidimeter. For DO, DOS and Salinity, duplicate measurements were performed by dropping the calibrated probes of the corresponding monitoring equipments to the designated depths of the water column and taking readings after stabilized. The duplicate measurements were averaged if the difference was not greater than 25%. If the difference is greater than 25%, repeat measurement will be required.

Table 6.5 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix I D1.

Table 6.5 Details of Marine Water Quality Monitoring Equipment (In-site measurement)

<i>Parameter</i>	<i>Model</i>	<i>Date of Calibration</i>	<i>Due Date</i>	<i>Equipment No.</i>
<i>Coordinate of Monitoring stations</i>	<i>MLR GPS Navigator, SP24</i>	<i>----</i>	<i>----</i>	<i>ET/EW/005/01*</i>
<i>Dissolved Oxygen (Saturation), Temperature, Salinity</i>	<i>YSI Dissolved Oxygen, Salinity &amp; Temperature Meter, YSI Pro2030</i>	<i>13/08/12 10/11/12</i>	<i>12/11/12 09/02/13</i>	<i>ET/EW/008/004*</i>
<i>Turbidity</i>	<i>HACH Model 2100Q Turbid Meter</i>	<i>09/10/12</i>	<i>08/01/13</i>	<i>ET/0505/009</i>
<i>Water Depth</i>	<i>EAGLE Strata 128 Sonar</i>	<i>----</i>	<i>----</i>	<i>EW/002/02</i>

Remark: (\*) indicates the instrument should be calibrated on use.

## 6.6 Action and Limit Level

The water quality criteria, namely Action and Limit (A/L) levels are presented in the table below.

Table 6.6 Water Quality Action and Limit Levels

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface &amp; Middle</u> <5.45 mg/L (5%-ile of baseline data) <u>Bottom</u> <4.72 mg/L (5%-ile of baseline data)	<u>Surface &amp; Middle</u> <5.10 mg/L (1%-ile of baseline data) <u>Bottom</u> <2.00 mg/L
SS (mg/L) (Depth-averaged)	>6.74 mg/L (95%-ile of baseline data) or >120% of the upstream control station's SS at the same tide on the same day	>7.67 mg/L (99%-ile of baseline data) or >130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>4.28 NTU (95%-ile of Impact data) or >120% of the upstream control station's turbidity at the same tide on the same day	>4.58 NTU (99%-ile of Impact data) or >130% of the upstream control station's turbidity at the same tide on the same day

## 6.7 Event and Action Plan

Please refer to the Appendix I F for details.

## 6.8 Monitoring Duration and Period in this reporting month

Below is the time schedule for the marine water quality monitoring events that were conducted in this reporting month:

Table 6.7 Time Schedule of Impact Marine Water Quality Monitoring

November 2012						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Remarks: (▼) = Marine water quality monitoring carried out by ET.

The daily marine water quality monitoring duration are detailed in Appendix I D2.

## 6.9 Marine Water Quality Monitoring Results

The impact water quality measurement results are detailed in Appendix I D2. Appendix I D3 presents the water quality monitoring data and graphical presentations of monitoring results respectively.

The summary of marine water quality exceedances is shown in Table 6.8.

Table 6.8 Summary of Impact Marine Water Quality Exceedances in this reporting month

Station	Exceedance Level	DO		Turbidity		SS		Total	
		Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb
TKO-C1	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0
TKO-M4	Action	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0

According to the summary of marine water monitoring results, no exceedance of Action and limit levels was recorded for this reporting month.



## 7.0 IEC SITE AUDIT AND WEEKLY ET SITE INSPECTIONS

### 7.1 IEC Site Audit

7.1.1 During this reporting period, the IEC team conducted two independent site audits of the Contract CV/2009/02 site (TKO Area 137 Fill Bank).

7.1.2 Findings of the site audit have been recorded on site checklists, copies of which were submitted to the Contractor for their further action as appropriate, and to the Client for their records. Key issues were highlighted to the Contractor's representative at the completion of each site audit to ensure that they were aware of the problem(s) identified and where necessary, to take immediate corrective actions. A copy of the completed checklists are appended to this report in Appendix I H.

Table 7.1 Dates of IEC Site Audits in this reporting month

Date of Audit	Work Period	Site Audit Checklist Submitted Under IEC's Ref No.
07 November 2012	Operation of TKO Area 137 Fill Bank	CEDPFRSFEM00_121107_TKOFB
23 November 2012		CEDPFRSFEM00_121123_TKOFB

7.1.3 The major findings recorded during the site audit conducted during this reporting period are summarized below. Full details are provided in the site audit checklists presented in Appendix I H.

Table 7.2 Key Findings of IEC Site Audits in this reporting month

Date	Key Findings	Action(s) Taken recommended by IEC	Action(s) Taken by the Contractor during the site audit	Rectification Status by IEC
07 November 2012	Deposition of silt and silty water were found at Catchpit No.8 at CREO. (Previous item)	The Contractor was reminded to frequently clean and maintain the catchpit.	The deposited silt inside catchpit had been cleared.	Closed
23 November 2012	No adverse environmental observation was recorded.			

### 7.2 Weekly ET Site Inspections

Weekly ET site inspections were carried out by ET to monitor the timely implementation of proper environmental pollution control and mitigation measures for the Project. In this reporting month, four weekly site inspections were conducted (07, 14, 23 and 28 November 2012).

Table 7.3 Key Findings of Weekly ET Site Audits in this reporting month

Date	Key Findings	Action(s) Taken recommended by IEC	Action(s) Taken by the Contractor during the site audit	Rectification Status by IEC
07 November 2012	Mud and silt were noted accumulated inside the drainage channel near Chung Shun Site Office. (Previous item)	The Contractor was reminded to clean the accumulated mud and silt and maintain the drainage channel properly.	Accumulated Mud and slit had been cleared.	Closed
14 November 2012	The skirt curtain of a generator at dry soils deposition area was broken. (New item)	The Contractor was reminded to replace a new skirt curtain immediately.	---	Follow-up
	C&D wastes such as steel and boxes were found discarded at Section A6 – Tyre Workshop. (New item)	The Contractor was reminded to collect and disposed of the waste properly.	---	Follow-up



Date	Key Findings	Action(s) Taken recommended by IEC	Action(s) Taken by the Contractor during the site audit	Rectification Status by IEC
23 November 2012	The skirt curtain of a generator at dry soils deposition area was broken. (Previous item)	The Contractor was reminded to replace a new skirt curtain immediately.	the skirt curtain of a generator at dry soils deposition area had been replaced.	Closed
	C&D wastes such as steel and boxes were found discarded at Section A6 – Tyre Workshop. (Previous item)	The Contractor was reminded to collect and dispose of the waste properly.	C&D wastes such as steel and boxes discarded at Section A6 – Tyre Workshop had been collected.	Closed
28 November 2012	No adverse environmental observation was recorded.			

### 7.3 Review of Environmental Monitoring Procedures

The monitoring works conducted by the Environmental Team were inspected regularly. The observations for the monitoring works were recorded and summarized as follows:

#### **Air Quality Monitoring**

- The monitoring team recorded the observations around the monitoring stations within and outside of the site.
- The monitoring team recorded the temperature, air pressure and general weather condition on the monitoring day.

#### **Noise Monitoring**

- The monitoring team recorded the observations around the monitoring station, which might affect the results.
- Major noise sources were identified and recorded.

#### **Water Quality Monitoring**

- The monitoring team recorded the observations around the monitoring stations, which might affect the results.

### 7.4 Assessment of Environmental Monitoring Results

All monitoring results were audited against the Action and Limit levels and any exceedance would be validated.

No exceedance was recorded in water quality, air quality and noise monitoring in this month.

The monitoring results in this reporting period were comparable with those of baseline period. Detailed discussions were given in Section 4, 5 and 6 of this Report.

### 7.5 Advice on the Solid and Liquid Waste Management Status

The Contractor usually disposed of non-inert waste, including general refuse and materials segregated from the existing stockpiles, to SENT landfill. Table 7.4 summarizes data on offsite waste disposal in this reporting month.

Table 7.4 Actual amounts of Waste generated in this reporting month

Waste Type	Actual Amount	Disposal Locations
Public Fill	0 m <sup>3</sup>	---
C&D Waste (general refuse)	0 m <sup>3</sup>	---
Chemical Waste	0 kg	---

The Contractor should provide sufficient preventive measures during equipment maintenance works so as to avoid oil leakage on the ground. In the event of any oil leakage, the Contractor should clean up the polluted soil and handle all the materials used for this cleaning works as chemical waste.

Concrete bunding has erected outside the CEDD combined reception office and near the automatic wheel washing facilities for storing generator sets and oil drums. The drain outlet of all the bunded areas should be plugged properly. Besides, pre-cast drip trays were provided for oil drums at several areas, such as workshop and chemical storage area. The Contractor should collect and dispose of any stagnant water accumulated in the concrete bunding and drip trays and handle them as chemical waste.

The Contractor should use suitable containers with proper labels to store chemical wastes in accordance with Code of Practice on the Packaging, Labeling and Storage of Chemical Waste. The Contractor should also advise their workers of the proper procedures in handling the chemical waste. All the trip tickets for chemical waste disposal were properly kept in the site office. No chemical waste disposal was undertaken in the reporting month.

The Contractor was reminded to increase the frequency of inspection and cleaning of the site drainage system, including permanent desilting chambers, desilting facilities, oil interceptor bypass tank, DP3 and DP4 and all the trapezoidal channels. Moreover, the Contractor should apply approved pesticides in the stagnant water ponds.

All the runoff from the parking area should be pumped to the desilting facilities and oil interceptors to remove suspended solids and oil & grease prior to discharge.

## 8.0 Status of Environmental Licensing and Permitting

All permits/licenses valid in this reporting month are summarized in Table 8.1.

Table 8.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Amended Environmental Permit	EP-134/2002/J	14/11/11	---	<ul style="list-style-type: none"> <li>▪ Site clearance</li> <li>▪ Construction of a temporary storm water system</li> <li>▪ Stockpiling of 6 million m3 of public fill</li> <li>▪ Setting up two barging points for transporting the stockpiled public fill by barges</li> <li>▪ Setting up a temporary barging point at the existing Explosive Off-loading Barging Point for the period of May 2004 to December 2004 for transporting the stockpiled public fill by barge</li> <li>▪ Construction of operation of a construction and Demolition Material Sorting Facility (C&amp;DMSF)</li> <li>▪ Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin</li> <li>▪ Remove the temporary fill bank</li> </ul>
Chemical Waste Producer	5213-839-C3577-02	17/12/09	---	Spent Lubricating Oil, Spent Flammable Liquid, Spent Battery containing Heavy Metals and Surplus Paint
Effluent Discharge License	WT00005777-2010	12/05/10	31/05/15	Wastewater arising from the wheel washing bay, Sedimentation Tank & Desilting Tank
Marine Dumping Permit	EP/MD/13-068	01/10/12	31/12/12	Approval for dumping 3,600,000 tons (approximately equal to 2,000,000 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank and MTR XRL Contracts 803A to D to designated dumping area at Guanghaiwan of Taishan

## 9.0 ENVIRONMENTAL NON-CONFORMANCE

### 9.1 Summary of air quality, noise and marine water quality

No Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded in this reporting month.



Since no documented complaints on noise issue were received in this reporting month, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was recorded according to the result from Day-time monitoring.

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded for this reporting month.

## 9.2 Summary of Environmental Complaints

No complaint was received in this reporting month.

## 9.3 Summary of Notification of Summons and successful Prosecution

There was no notification of summons and successful prosecution respect to environmental issues registered in this reporting month.

## 10.0 IMPLEMENTATION STATUS

### 10.1 Implementation Status of Environmental Mitigation Measures

An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in Appendix I J. Most of the necessary mitigation measures were implemented properly. Any deficiencies were noted in the remarks of the schedule.

### 10.2 Implementation Status of Event and Action Plan

Since no exceedance of Action and Limit level of air, noise and marine water monitoring results was recorded for this reporting month, no further action was required.

### 10.3 Implementation Status of Environmental Complaint, Notifications of Summons and Successful Prosecutions Handling

No complaint, notification of summon and successful prosecution was received in this reporting month. A summary of environmental complaints, notifications of summons and successful prosecutions was given in Table 10.1 and further details of the complaint could be found in the Complaint Log (Appendix I M).

Table 10.1 Summary of Environmental Complaints and Prosecutions

<i>Complaints logged</i>		<i>Summons served</i>		<i>Successful prosecution received</i>	
<i>November 2012</i>	<i>Cumulative</i>	<i>November 2012</i>	<i>Cumulative</i>	<i>November 2012</i>	<i>Cumulative</i>
0	5	0	0	0	0

## 11.0 CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Impact monitoring of air quality, noise and water quality were carried out at designated locations in accordance with the EM&A Manual in this reporting month.

No Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded in this reporting month.

Since no documented complaints on noise issue were received in this reporting month, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was recorded according to the result from Day-time monitoring.

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded for this reporting month.

According to the ET weekly site inspections and IEC site audits carried out in this reporting month, the Contractor generally implemented sufficient dust mitigation measures, including operation of the mist spraying systems and automatic wheel washing facilities, dampening of haul roads and stockpiling areas.

No complaint, prosecutions and notifications of summons were received in this reporting month.

### **Recommendations**

According to the environmental site inspections performed in the reporting month, the following recommendations were provided:

#### ***Air Quality***

- Ensure the frequency of water spraying on haul roads, unloading areas and stockpiles to be sufficient to suppress the dust sources;
- Provide proper maintenance for the powered mechanical equipment and barges to avoid emission of dark smoke;
- Provide water spraying onto the truckloads during inspection of fill material;
- Conduct road sweeping on all paved haul roads and public roads especially outside and near the site egress by the road sweeper. Undertake water spraying on stockpiling area by water bowsers;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the site activities;
- Designate proper haul roads to ensure effective water spraying; and
- Ensure all vehicles to be washed before leaving the site egress by provision, operation and maintenance of automatic wheel washing facilities.

#### ***Noise***

- Conduct noisy activities at a farther location from the NSRs.

#### ***Water Quality***

- Maintain the drainage system, including the trapezoidal channels, permanent desilting chambers, DP3 & DP4 regularly;
- Operate and maintain the silt curtains regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- Provide proper treatment for the oil discharge from the area near air monitoring station TKO-A1;
- Clean up the fill material on the concrete pavement at BHA frequently; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

#### ***Chemical and Waste Management***

- Remove waste materials from the site to avoid accumulation regularly;
- Handle and store chemical wastes properly;
- Remove unwanted material in the existing stockpiles and avoid further dumping of such material;
- Provide and maintain sufficient drip trays for diesel drums, chemical containers, chemical waste storage drums and diesel operated generator set;
- Maintain mesh screen on top of the additional drainage to avoid improper dumping of rubbish;
- Maintain good housekeeping at the workshop area;
- Ensure sufficient tarpaulin sheets are provided to cover drip trays; and
- Avoid soil being polluted during oil filling and equipment maintenance; hence, properly remove and store the contaminated soil, if any.

#### ***Landscape and Visual***

- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding/chaining fences in accordance with agreed design at proper location; and
- Maintain the hydroseeded slopes in accordance with the Landscape Plan.



## 12.0 FUTURE KEY ISSUES

### 12.1 Work Programme for the Coming Month

As informed by the Contractor, the activities to be conducted by them in the next month included:

- Removal & delivery of public fill stockpiled material to Mainland
- Operation of the road water lorries and the road sweeper
- Maintenance of haul road within fill bank area.
- Delivery of public fill received at the Chai Wan Public Fill Barging Point to TKO fill bank
- Operation of the tipping hall (A1, A2 & A3)
- Operation of the queuing area for public truck lorries
- Operation of stone crushing plant at TKOFB
- Maintenance of the Tripping Hall (A1, A2 & A3)

### 12.2 Key Issues for the Coming Month

**Key issues to be considered in the coming month include:**

- Chemical and waste management;
- Treatment of runoff and wastewater prior to discharge;
- Dust generated from loading and unloading activities; and
- Dust generated from dump trucks traffic.

**Mitigation measures to be required in the coming month:**

#### Air Quality Impact

- To provide adequate water spraying on haul roads and working platform;
- To operate and maintain automatic wheel washing facilities properly;
- To dampen the fill material prior to unloading or movement;
- To provide road sweeping on haul road near site egress and public roads outside site egress;
- To ensure implementation of the dust mitigation measures for the site activities;
- To maintain proper operation of the mist spraying system;
- To provide proper maintenance for vehicles and machines on site; and
- To investigate any other dust sources around the air sensitive receivers

#### Noise

- To switch off equipment if not in use;
- To operate silent equipment;
- To identify the noise sources inside and outside of the site;
- To follow up any exceedance caused by the Fill Bank operation; and
- To re-schedule the work activities in the event of valid noise exceedance.

#### Water Quality Impact

- To maintain the drainage system in the Fill Bank;
- To ensure the cleanliness of oil interceptor bypass tanks and all the drainage channels;
- To maintain the existing silt trap to ensure good efficiency of wheel wash facilities;
- To repair, inspect and maintain the silt curtains regularly;
- To provide covers for the drip trays to avoid stagnant water pond due to rainfall;
- To provide proper treatment for oily water discharged from the area around air monitoring station TKO-A1;
- To deploy a cleaning vessel to remove floating rubbish in the TKO Basin;
- To clean up the concrete paved area at Portion I every night to avoid fill materials from being washed into the sea; and
- To avoid any stagnant water or provide insecticide to avoid mosquito breeding in the Fill Bank.



Chemical and Waste Management

- To remove waste from the site regularly;
- To properly store and handle chemical wastes on site;
- To implement trip ticket system for all the imported public fill and general refuse disposal;
- To provide and manage sufficiently sized drip trays for diesel drums or chemical containers;
- To remove existing unwanted material in the stockpiles and avoid improper disposal at the Fill Bank through inspection of imported truckloads;
- To maintain proper housekeeping at the workshop area;
- To remove the oil stains in the event of leakage and handle all materials using for this cleaning works as chemical waste;
- To maintain mesh screen on top of the additional drainage, DP3 opening to avoid improper dumping of rubbish into this channel; and
- To identify C&D material by packaging, labeling, storage, transportation and disposal in accordance with statutory regulations.

**12.3 Monitoring Schedule for the Coming Month**

The proposed EM&A program of the coming month is attached in Appendix I L.

- END OF REPORT -



## **Appendix I**

### **A**

## **Organization Chart and Lines of Communication**



**JOINT VENTURE MANAGEMENT BOARD**  
**CHEN Fan Jian, WANG Yan, PAN Shu Jie, George CHAN**

- Project Director: **Yang Min**
- Project Manager: **Shum Hong Sui**
- Deputy Project Manager: **Zhou Chang Ying**

QA Team  
**Allan D Herrera**

Health & Safety Manager  
**S. L. So, Lawrence**

Environmental Engineer  
**Jimmy K.W. Ng**

Commercial Manager  
**K.S. Lo, Tom**  
**O.H. Chau, Irene**

Project Representative (Mainland)  
**Yang Min**  
 Site Representative (Mainland)  
**Zhou Chang Ying**  
 Assistant Project Manager (Mainland)  
**Lian Xue Bao**

Administration Manager  
**Ms. Becky Chan**  
**Sau Ngor**

Contractor's Agent  
**Lok Wah Yung**

Senior Planning Engineer  
**Star CHEUNG**

Operation Manager (TKO & CW)  
**Simon Pan**

Chief Surveyor  
**S.P. Mok**

Environmental Officer  
**Tang Hoi Fung**

Environmental Supervisor  
**Sing Sau Wang**

Environmental Team Leader  
**C.L. Lau**

Safety Advisor  
**John Lau Chi Wing**

Safety Officers  
**Francis Lau Kin Chung & Ho Chi Yiu**

Safety Supervisor(s)

Environmental Team EIS Resources Ltd.

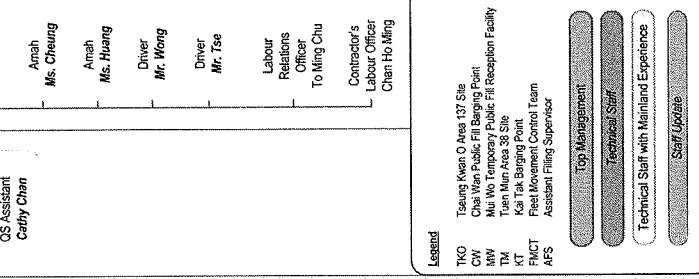
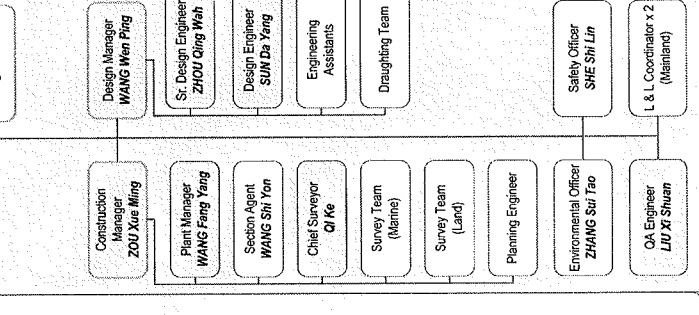
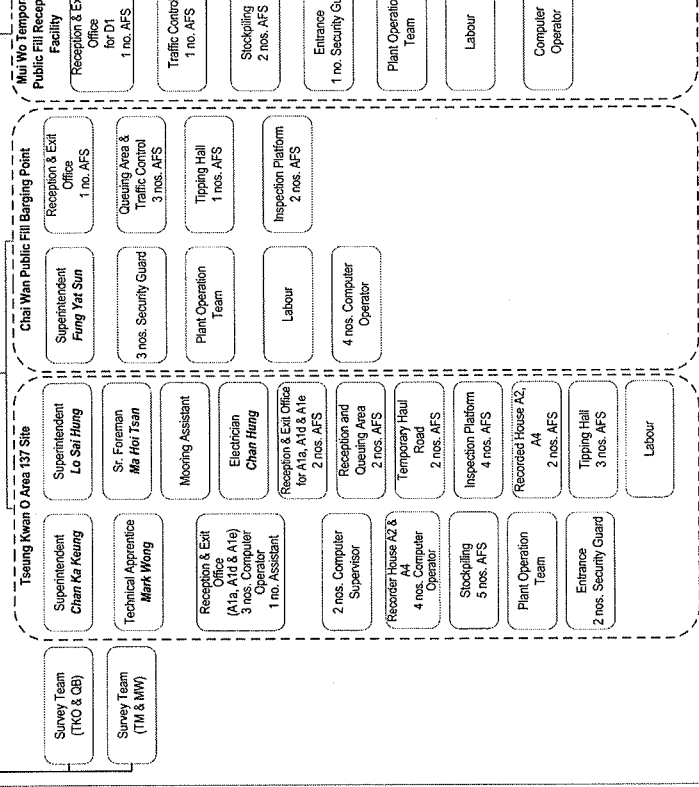
**CONSTRUCTION & OPERATION TEAM**

- Chief Surveyor (TKO & CW): **Simon Pan**
- Operation Manager (MW & TM): **Zhou Chang Ying**
- Assistant Operation Manager: **Tang Hoi Fung**
- Graduate Engineer: **Alan Lo**
- Project Engineer: **Tommy Chu**
- Graduate Engineer: **Jack Chan**

- Liaison & Logistic (L & L) Manager (KT): **Phillip Leung**
- Engineer: **Tam Wing Lim**
- L & L Coordinators: **Wai Yeung, Andy Kwok, Sunny Yu**

- MAN/LAND TEAM
- Operation Manager: **CHEN Gui Tan**
- Coordinator: **Peng Yao Nan**
- Design Manager: **WANG Wen Ping**
- Construction Manager: **ZOU Xue Ming**
- Plant Manager: **WANG Fang Yang**
- Section Agent: **WANG Shi Yon**
- Chief Surveyor: **Qi Ke**
- Survey Team (Mainland)
- Survey Team (Land)
- Planning Engineer
- Environmental Officer: **ZHANG Sui Tao**
- QA Engineer: **LIU Xi Shuan**
- Safety Officer: **SHE Shi Lin**
- L & L Coordinator x 2 (Mainland)

- COMMERCIAL
- Q.S.: **Michael Chan**
- Q.S.: **Michael Fok**
- OS Assistant: **Carly Chan**
- ADMINISTRATION
- Administration Officer: **Ms. Eling Yu**
- Site Clerk: **Ms. Shady Leung**
- Amah: **Ms. Cheung**
- Amah: **Ms. Huang**
- Driver: **Mr. Wong**
- Driver: **Mr. Tse**
- Labour Relations Officer: **To Ming Chu**
- Contractor's Labour Officer: **Chan Ho Ming**



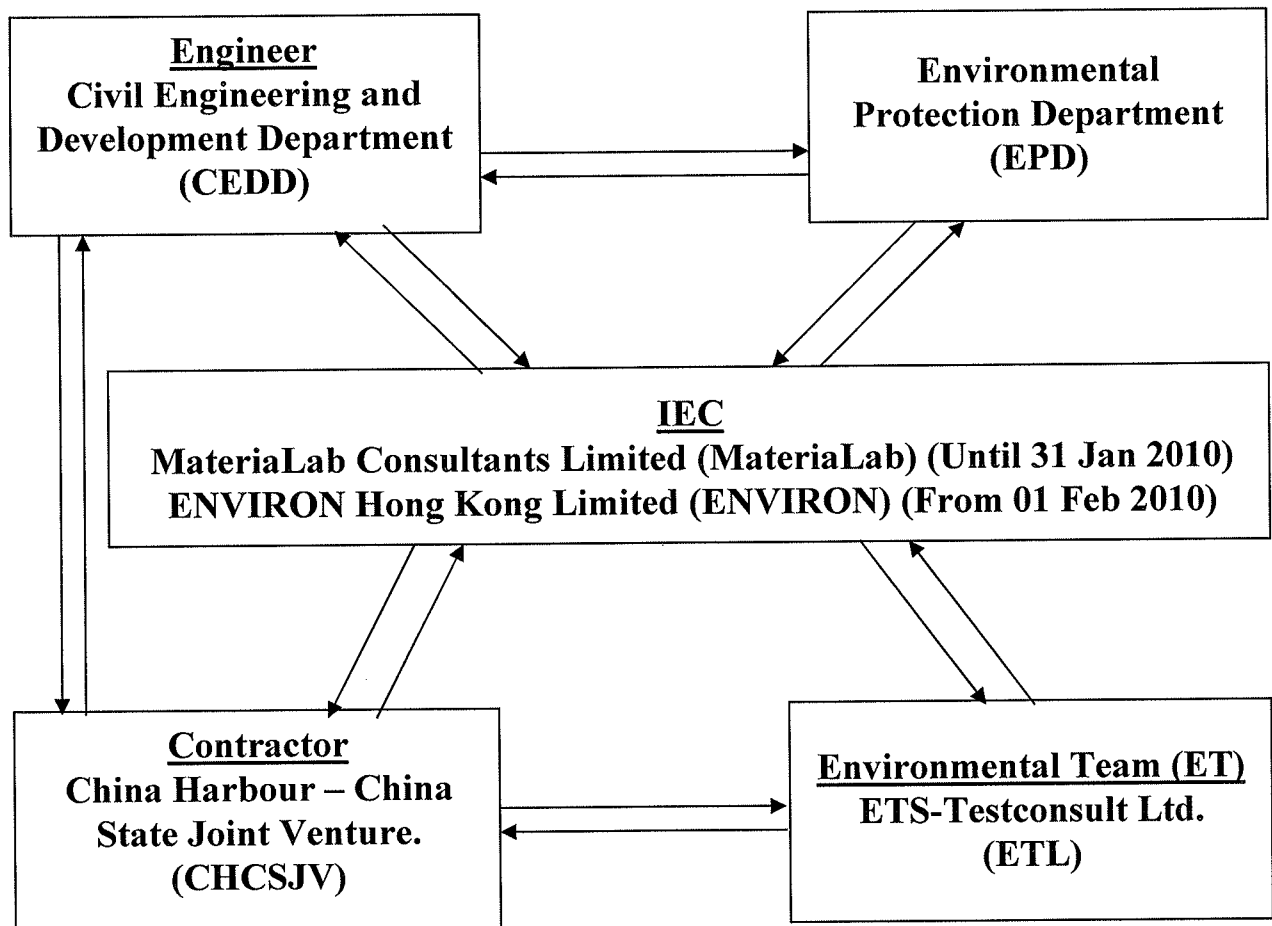
**Legend**

- TKO: Tsung Kwan O Area 137 Site
- CW: Chai Wan Public Fill Barging Point
- MW: Mui Wo Temporary Public Fill Reception Facility
- TM: Tuen Mun Area 38 Site
- KT: Kai Tak Barging Point
- PLMCT: Fleet Movement Control Team
- AFS: Assistant Filing Supervisor

**Management Levels:**

- Top Management
- Technical Staff
- Technical Staff with Mainland Experience
- Staff Update

# Lines of Communication





## **Appendix I**

### **B1**

# **Calibration Certificates for Impact Air Quality Monitoring Equipment**



**東業德勤測試顧問有限公司**  
**ETS-TESTCONSULT LIMITED**

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
 Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
 Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

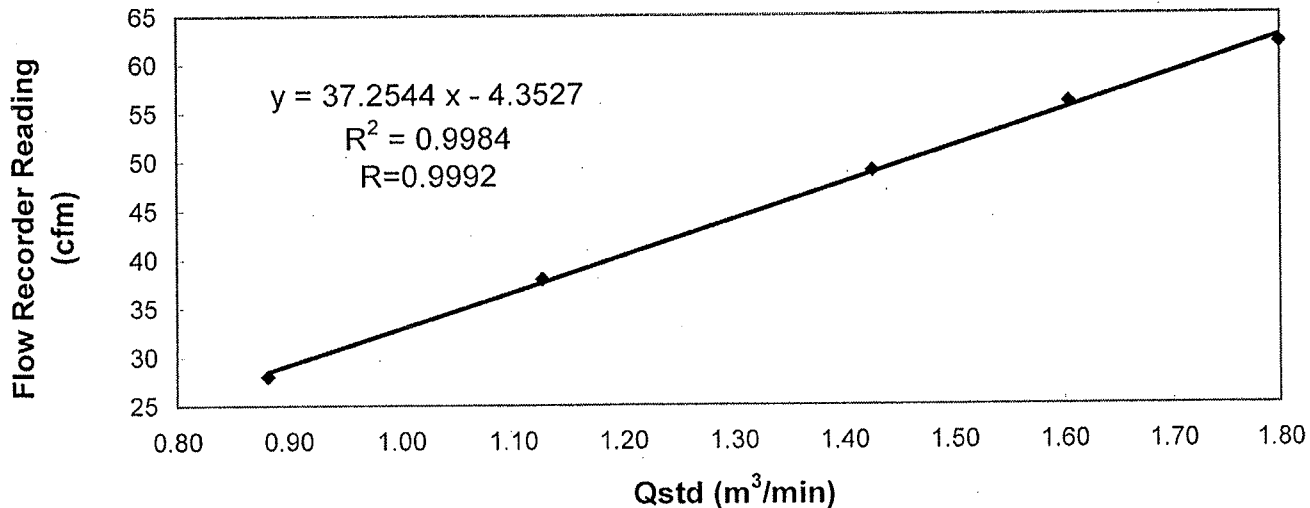
**Calibration Report**  
**of**  
**High Volume Air Sampler**

**Manufacturer** : Graseby GMW **Date of Calibration** : 17 September 2012  
**Serial No.** : 10581 ( ET / EA / 003 / 22 ) **Calibration Due Date** : 16 November 2012  
**Method** : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

**Results** :

Flow recorder reading (cfm)	62	56	49	38	28
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.80	1.60	1.43	1.13	0.88
Pressure :	761.31	mm Hg	Temp. :	303	K

**Sampler 10581 Calibration Curve**  
**Site: Tseung Kwan O A-1**



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies\* / does not comply\* with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by :   
 LEE, Chak Man  
 (Site Technician)

Checked by :   
 LAU, Chi Leung  
 ( Environmental Consultant)



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

8/F, Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

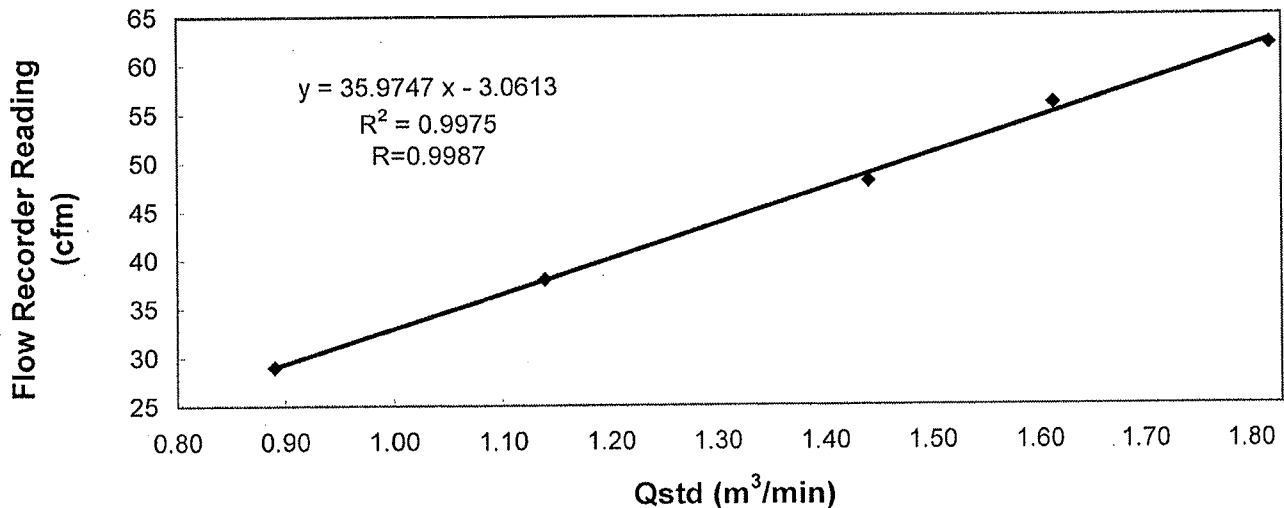
**TEST REPORT**

**Calibration Report**  
of  
**High Volume Air Sampler**

Manufacturer : Graseby GMW Date of Calibration : 16 November 2012  
Serial No. : 10581 ( ET / EA / 003 / 22 ) Calibration Due Date : 15 January 2013  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	62	56	48	38	29
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.82	1.61	1.44	1.14	0.89
	Pressure : 762.06 mm Hg	Temp. : 297 K				

**Sampler 10581 Calibration Curve**  
Site: Tseung Kwan O A-1

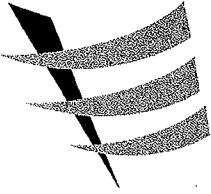


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies\* / does not comply\* with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by : MAK, Kei Wai  
MAK, Kei Wai  
(Assistant Supervisor)

Checked by : LAW, Sau Yee  
LAW, Sau Yee  
(Senior Environmental Officer)



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

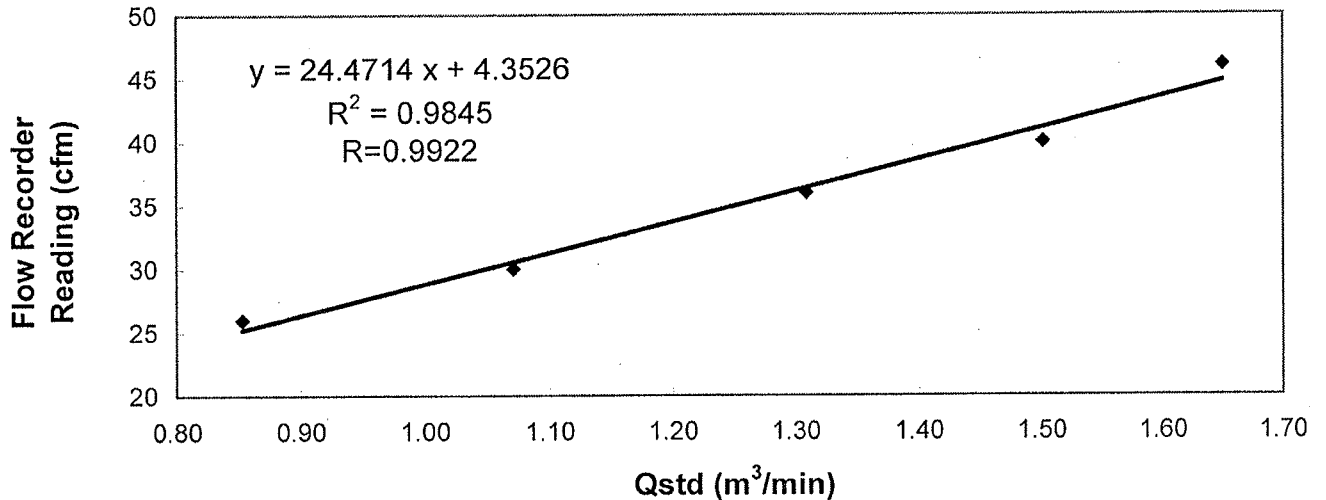
**TEST REPORT**

**Calibration Report  
of  
High Volume Air Sampler**

Manufacturer : Graseby GMW Date of Calibration : 17 September 2012  
Serial No. : 1172 (ET / EA / 003 / 11) Calibration Due Date : 16 November 2012  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	46	40	36	30	26
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.65	1.50	1.31	1.07	0.85
	Pressure : 761.31 mm Hg	Temp. : 303 K				

**Sampler 1172 Calibration Curve  
Site: Tseung Kwan O A-2**

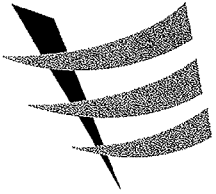


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies\* / ~~does not comply\*~~ with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by :   
LEE, Chak Man  
(Site Technician)

Checked by :   
LAU, Chi Leung  
( Environmental Consultant)



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

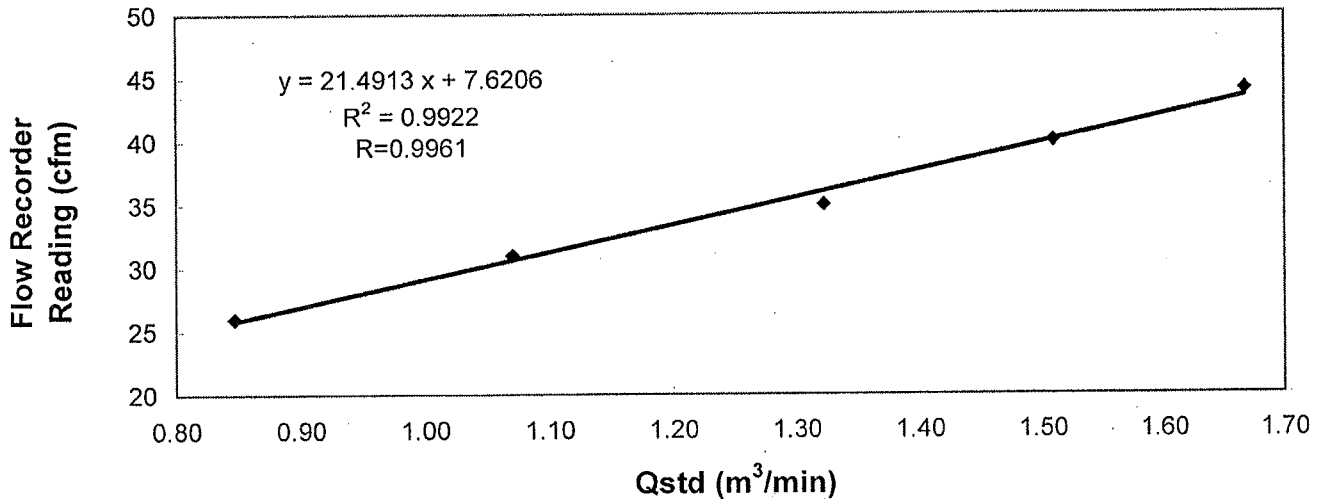
**TEST REPORT**

**Calibration Report  
of  
High Volume Air Sampler**

Manufacturer : Graseby GMW Date of Calibration : 16 November 2012  
Serial No. : 1172 (ET / EA / 003 / 11) Calibration Due Date : 15 January 2013  
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	44	40	35	31	26
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.67	1.51	1.32	1.07	0.85
	Pressure :	762.06	mm Hg	Temp. :	297	K

**Sampler 1172 Calibration Curve  
Site: Tseung Kwan O A-2**

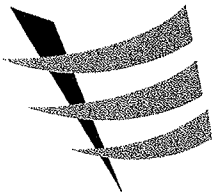


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration.

The high volume sampler complies\* / does not comply\* with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by : MAK Kei Wai  
MAK Kei Wai  
(Assistant Supervisor)

Checked by : LAW, Sau Yee  
LAW, Sau Yee  
(Senior Environmental Officer)



**東業德勤測試顧問有限公司**  
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8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
 Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
 Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

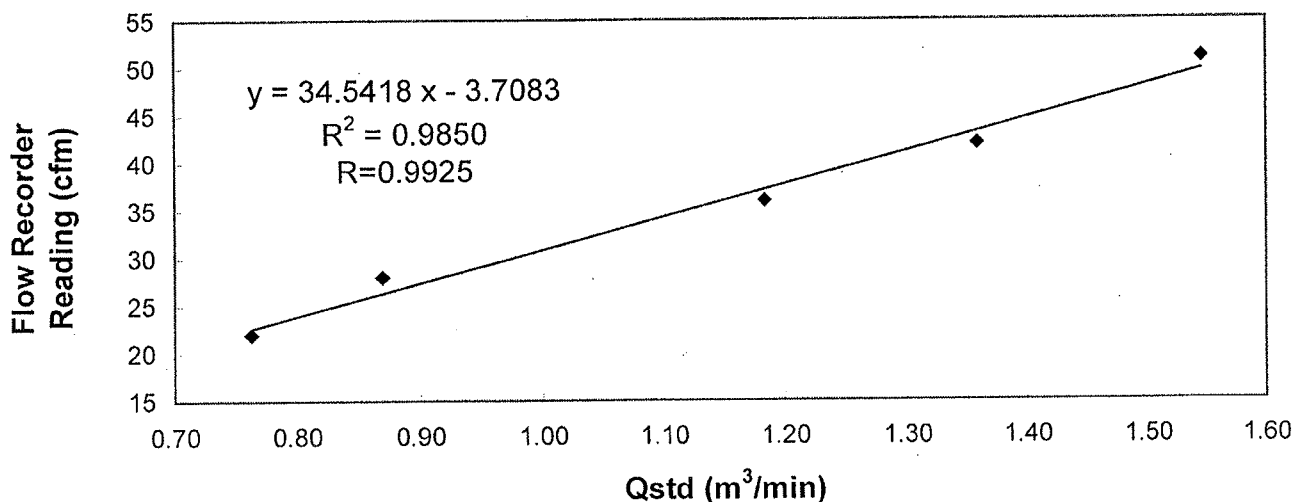
**Calibration Report**  
 of  
**High Volume Air Sampler**

**Manufacturer** : Graseby GMW **Date of Calibration** : 25 September 2012  
**Serial No.** : 9795 ( ET / EA / 003 / 18 ) **Calibration Due Date** : 24 November 2012  
**Method** : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

**Results** :


Flow recorder reading (cfm)	51	42	36	28	22
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.55	1.36	1.18	0.87	0.76
Pressure :	759.81 mm Hg			Temp. :	301 K

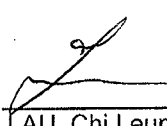
**Sampler 9795 Calibration Curve**  
 Site: Tuen Mun (A1)



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies\* / does not comply\* with the specified requirements and is deemed acceptable\* / unacceptable\* for use.

Calibrated by :   
 Lee, Chak Man  
 (Site Technician)

Checked by :   
 LAU, Chi Leung  
 ( Environmental Consultant)





TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE.  
 VILLAGE OF CLEVELAND, OH 43002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX  
 WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - May 30, 2012 Rootsmeter S/N 0438320 Ta (K) - 298  
 Operator Tisch Orifice I.D. - 2193 Pa (mm) - 748.03

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4420	3.2	2.00
2	NA	NA	1.00	1.0190	6.4	4.00
3	NA	NA	1.00	0.9100	7.9	5.00
4	NA	NA	1.00	0.8680	8.8	5.50
5	NA	NA	1.00	0.7170	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9800	0.6796	1.4030	0.9957	0.6905	0.8926
0.9758	0.9576	1.9842	0.9915	0.9730	1.2623
0.9738	1.0701	2.2184	0.9893	1.0872	1.4113
0.9727	1.1206	2.3267	0.9882	1.1385	1.4802
0.9674	1.3492	2.8061	0.9828	1.3708	1.7852
Qstd slope (m) = 2.09529			Qa slope (m) = 1.31204		
intercept (b) = -0.02194			intercept (b) = -0.01396		
coefficient (r) = 0.99999			coefficient (r) = 0.99999		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

$$Qstd = Vstd / \text{Time}$$

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

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

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

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



## Appendix I

### B2

## Impact Air Quality Monitoring Results

## Summary of 24-hr TSP Monitoring Results

Monitoring Station : TKO-A1  
Location : Site Egress

Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
02/11/12	14:00	03/11/12	14:00	18817.33	18841.33	24.00	Initial 1.0295	Final 1.0295	1.0295	Initial 2.7612	Final 2.9215	108
08/11/12	09:00	09/11/12	09:00	18843.33	18867.33	24.00	Initial 1.0295	Final 1.0295	1.0295	Initial 2.7543	Final 2.9103	105
14/11/12	13:00	15/11/12	13:00	18871.33	18895.33	24.00	Initial 1.0295	Final 1.0295	1.0295	Initial 2.8012	Final 2.9741	117
20/11/12	09:00	21/11/12	09:00	18897.33	18921.33	24.00	Initial 1.0302	Final 1.0302	1.0302	Initial 2.7704	Final 2.9585	127
26/11/12	16:30	27/11/12	16:30	18925.33	18949.33	24.00	Initial 1.0858	Final 1.0858	1.0858	Initial 2.7335	Final 2.9127	115

Monitoring Station : TKO-A2a  
Location : new CREO

Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
02/11/12	14:00	03/11/12	14:00	18010.44	18034.44	24.00	Initial 1.2115	Final 1.2115	1.2115	Initial 2.7398	Final 2.9092	97
08/11/12	09:00	09/11/12	09:00	18036.44	18060.44	24.00	Initial 1.2115	Final 1.2115	1.2115	Initial 2.7359	Final 2.8989	93
14/11/12	13:05	15/11/12	13:05	18064.44	18088.44	24.00	Initial 1.2115	Final 1.2115	1.2115	Initial 2.7953	Final 2.9530	90
20/11/12	09:00	21/11/12	09:00	18090.44	18114.44	24.00	Initial 1.2274	Final 1.2274	1.2274	Initial 2.7531	Final 2.9409	106
26/11/12	16:30	27/11/12	16:30	18118.44	18142.44	24.00	Initial 1.1809	Final 1.1809	1.1809	Initial 2.7326	Final 2.9137	106

## Summary of 1-hr TSP Monitoring Results

Monitoring Station : TKO-A1  
Location : Site Egress

Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
02/11/12	10:00	11:00	18816.33	18817.33	1.00	1.0295	1.0295	1.0295	2.7442	2.7584	230
05/11/12	15:00	16:00	18841.33	18842.33	1.00	1.0295	1.0295	1.0295	2.7398	2.7559	261
07/11/12	16:00	17:00	18842.33	18843.33	1.00	1.0295	1.0295	1.0295	2.7405	2.7573	272
09/11/12	09:05	10:05	18867.33	18868.33	1.00	1.0295	1.0295	1.0295	2.7526	2.7682	253
09/11/12	10:10	11:10	18868.33	18869.33	1.00	1.0295	1.0295	1.0295	2.7468	2.7626	256
12/11/12	10:40	11:40	18869.33	18870.33	1.00	1.0295	1.0295	1.0295	2.7248	2.7419	277
14/11/12	09:00	10:00	18870.33	18871.33	1.00	1.0295	1.0295	1.0295	2.7772	2.7926	249
16/11/12	09:40	10:40	18895.33	18896.33	1.00	1.0302	1.0302	1.0302	2.7812	2.7972	259
19/11/12	15:22	16:22	18896.33	18897.33	1.00	1.0302	1.0302	1.0302	2.7684	2.7815	212
21/11/12	14:50	15:50	18921.33	18922.33	1.00	1.0302	1.0302	1.0302	2.7512	2.7676	265
21/11/12	15:55	16:55	18922.33	18923.33	1.00	1.0302	1.0302	1.0302	2.7512	2.7662	243
23/11/12	13:50	14:50	18923.33	18924.33	1.00	1.0302	1.0302	1.0302	2.7343	2.7515	278
26/11/12	15:00	16:00	18924.33	18925.33	1.00	1.0302	1.0302	1.0302	2.7212	2.7379	270
28/11/12	09:40	10:40	18949.33	18950.33	1.00	1.0302	1.0302	1.0302	2.7507	2.7685	288
30/11/12	09:00	10:00	18950.33	18951.33	1.00	1.0302	1.0302	1.0302	2.7524	2.7694	275

Monitoring Station : TKO-A2a  
Location : New CREO

Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m <sup>3</sup> /min.)		Average (m <sup>3</sup> /min.)	Filter Weight (g)		Conc. (µg/m <sup>3</sup> )
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
02/11/12	10:05	11:05	18009.44	18010.44	1.00	1.2115	1.2115	1.2115	2.7561	2.7700	191
05/11/12	15:10	16:10	18034.44	18035.44	1.00	1.2115	1.2115	1.2115	2.7406	2.7562	215
07/11/12	16:15	17:15	18035.44	18036.44	1.00	1.2115	1.2115	1.2115	2.7501	2.7660	219
09/11/12	09:10	10:10	18060.44	18061.44	1.00	1.2115	1.2115	1.2115	2.7710	2.7861	208
09/11/12	10:22	11:22	18061.44	18062.44	1.00	1.2115	1.2115	1.2115	2.7526	2.7678	209
12/11/12	10:45	11:45	18062.44	18063.44	1.00	1.2115	1.2115	1.2115	2.7289	2.7469	248
14/11/12	09:15	10:15	18063.44	18064.44	1.00	1.2115	1.2115	1.2115	2.7584	2.7731	202
16/11/12	09:45	10:45	18088.44	18089.44	1.00	1.2274	1.2274	1.2274	2.7784	2.7939	210
19/11/12	15:31	16:31	18089.44	18090.44	1.00	1.2274	1.2274	1.2274	2.7612	2.7763	205
21/11/12	14:55	15:55	18114.44	18115.44	1.00	1.2274	1.2274	1.2274	2.7609	2.7766	213
21/11/12	16:00	17:00	18115.44	18116.44	1.00	1.2274	1.2274	1.2274	2.7434	2.7565	178
23/11/12	13:55	14:55	18116.44	18117.44	1.00	1.2274	1.2274	1.2274	2.7512	2.7651	189
26/11/12	15:05	16:05	18117.44	18118.44	1.00	1.2274	1.2274	1.2274	2.7403	2.7545	193
28/11/12	09:45	10:45	18142.44	18143.44	1.00	1.2274	1.2274	1.2274	2.7424	2.7550	171
30/11/12	09:05	10:05	18143.44	18144.44	1.00	1.2274	1.2274	1.2274	2.7449	2.7590	191

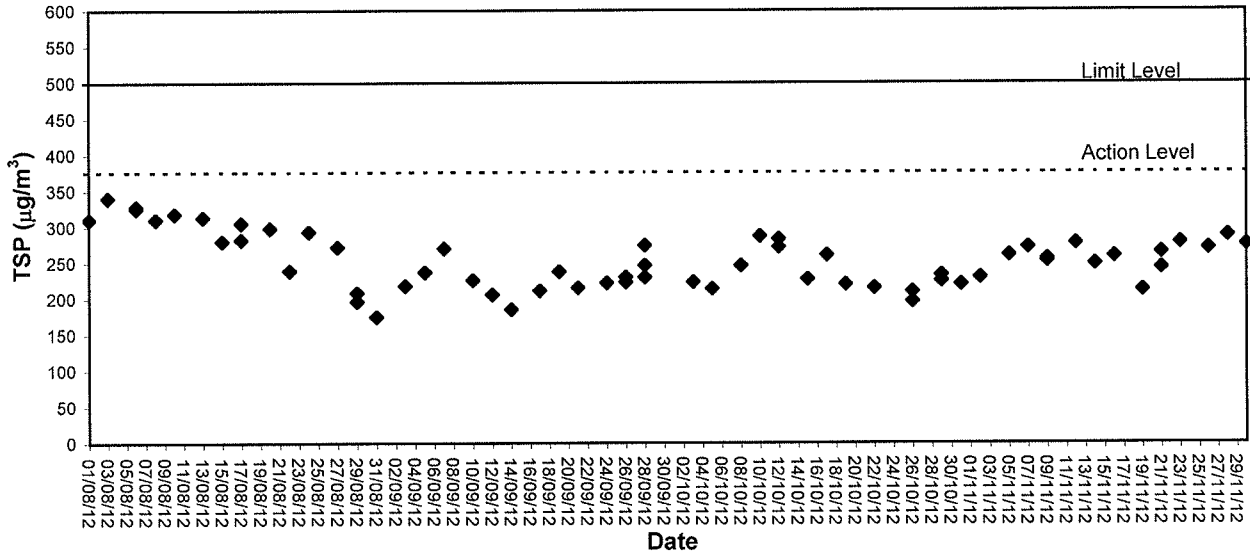
## **Appendix I**

### **B3**

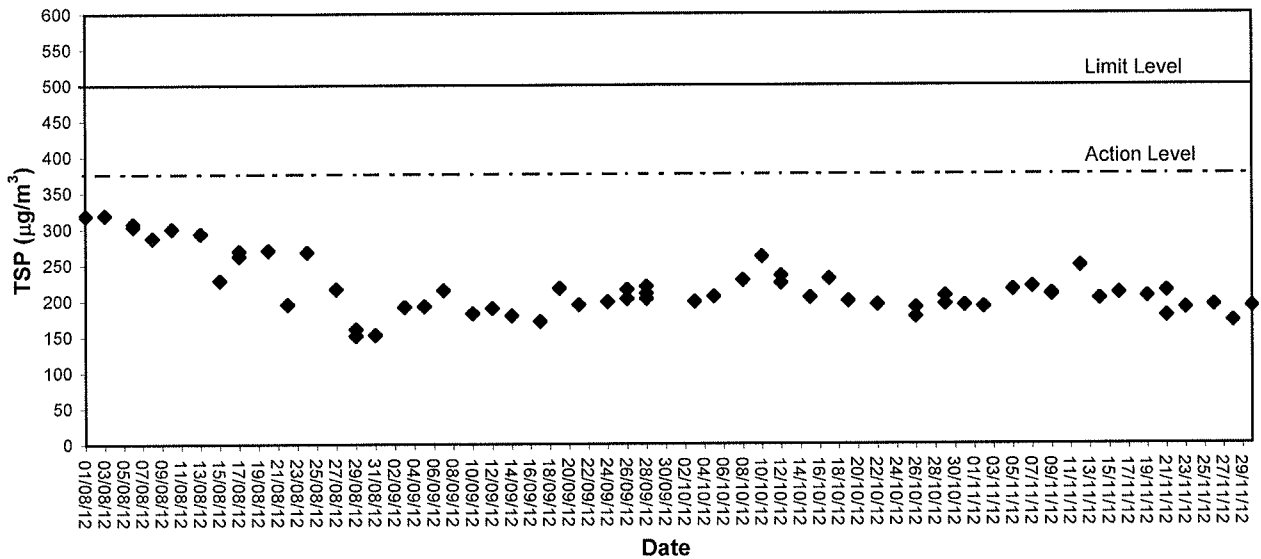
#### **Graphical Plots of Impact Air Quality Monitoring Data**



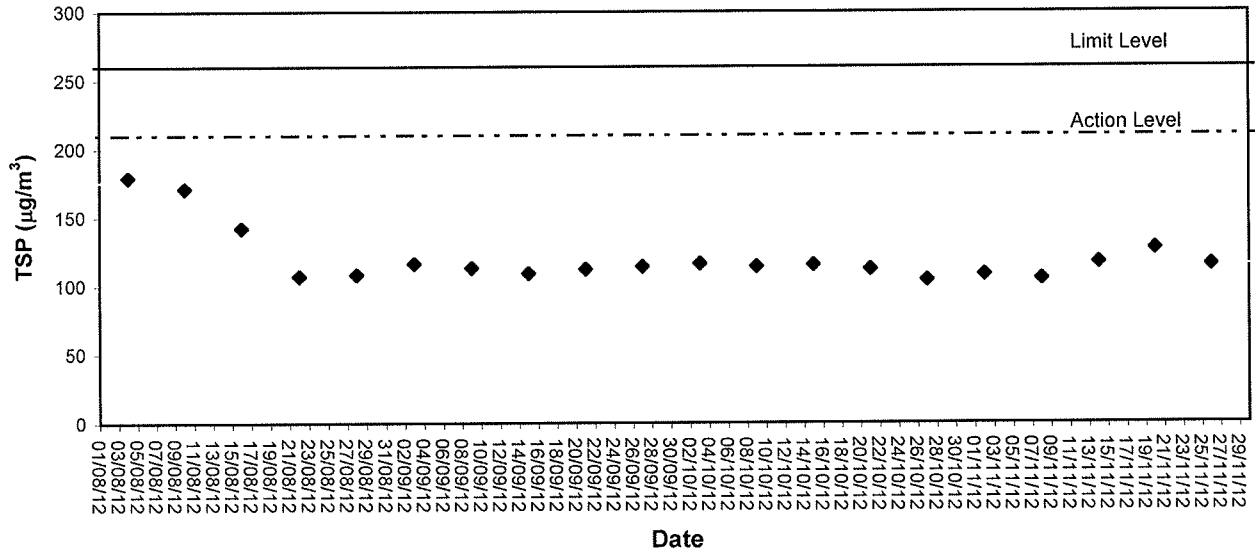
1-hour TSP level at TKO-A1



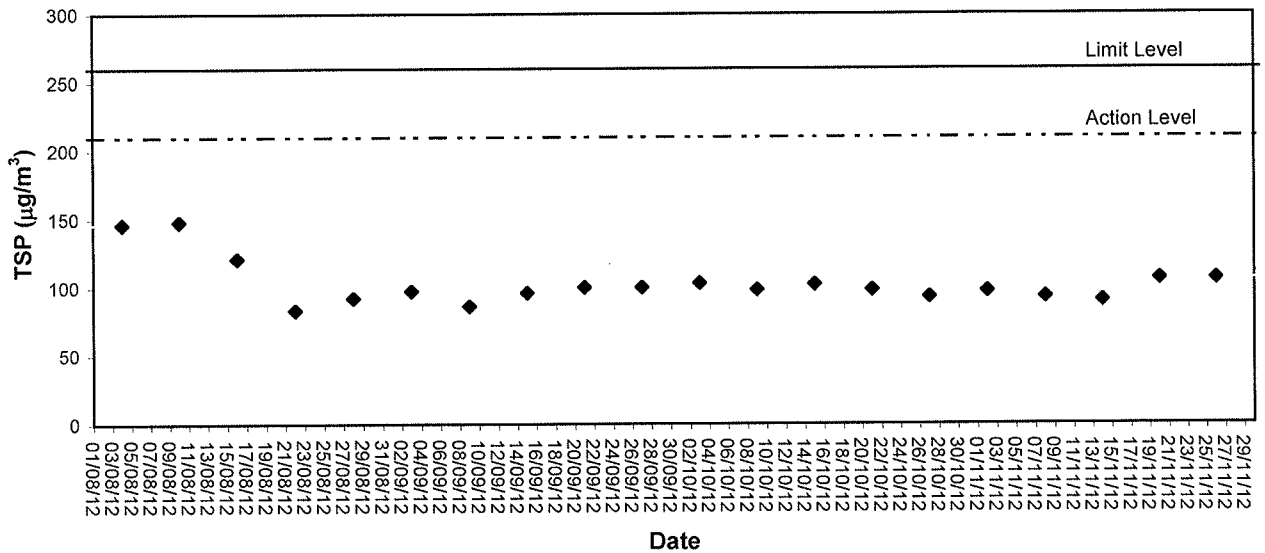
1-hour TSP level at TKO-A2a



**24-hour TSP level at TKO-A1**



**24-hour TSP level at TKO-A2a**



## **Appendix I**

### **C1**

## **Calibration Certificates for Impact Noise Monitoring Equipment**





# Calibration Certificate

Certificate No. **17299**

Page 1 of 3 Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q12949

**Date of receipt :** 5-Dec-11

## Item Tested

**Description :** Precision Integrating Sound Level Meter (ET/EN/003/12)

**Manufacturer :** Rion

**Model :** NL-31

**Serial No. :** 00773032

## Test Conditions

**Date of Test :** 6-Dec-11

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : Z01.

## Test Results


All results were within the IEC 651 Type1 and IEC 804 Type 1 specification.  
The results are shown in the attached page(s).

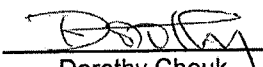
Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017A	Multi-Function Generator	07279	SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P. F. Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 7-Dec-11

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

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# Calibration Certificate

Certificate No. 17299

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 - 100	L <sub>A</sub>	Fast	94.0	94.3
		Slow		94.3
	L <sub>C</sub> L <sub>p</sub>	Fast		94.3
		Fast		94.3
30 - 120	L <sub>A</sub>	Fast	94.0	94.1
		Slow		94.1
	L <sub>C</sub> L <sub>p</sub>	Fast		94.0
		Fast		94.0
30 - 120	L <sub>A</sub>	Fast	114.0	114.0
		Slow		114.0
	L <sub>C</sub> L <sub>p</sub>	Fast		114.1
		Fast		114.1

IEC 651 Type 1 Spec. :  $\pm 0.7$  dB  
Uncertainty :  $\pm 0.1$  dB

## 2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. :  $\pm 0.3$  dB  
Uncertainty :  $\pm 0.01$  dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	114.1	0.0	$\pm 0.7$ dB
130	104.0	104.1	0.0	
120	94.0	94.1 (Ref.)	--	
110	84.0	84.2	+0.1	
100	74.0	74.1	0.0	
90	64.0	64.1	0.0	
80	54.0	54.2	+0.1	

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 17299

Page 3 of 3 Pages

## 3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	84.1	0.0	± 0.4 dB
	94.0	94.1 (Ref.)	--	
	95.0	95.1	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

## 4. Frequency Weighting

A weighting

Frequency.	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, ± 1.5 dB
63 Hz	-26.3	- 26.2 dB, ± 1.5 dB
125 Hz	-16.3	- 16.1 dB, ± 1 dB
250 Hz	-8.7	- 8.6 dB, ± 1 dB
500 Hz	-3.3	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+1.2	+ 1.2 dB, ± 1 dB
4 kHz	+1.0	+ 1.0 dB, ± 1 dB
8 kHz	-1.2	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	-6.6	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
1/10 <sup>2</sup>	40.0	39.9	
1/10 <sup>3</sup>	40.0	39.9	
1/10 <sup>4</sup>	40.0	40.0	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 012 hPa.

----- END -----



# Calibration Certificate

Certificate No. **22086**

Page 1 of 2 Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q20865

**Date of receipt :** 11-Apr-12

## Item Tested

**Description :** Acoustic Calibrator

**Manufacturer :** Castle

**Model :** GA607

**Serial No. :** 038641

## Test Conditions

**Date of Test :** 16-Apr-12

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : F06, F20, Z02.

## Test Results

All results were within the IEC 942 Class 1 specification.


The results are shown in the attached page(s).


Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	13535	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	15136	NIM-PRC & SCL-HKSAR
S041	Universal Counter	15610	SCL-HKSAR
S206	Sound Level Meter	16338	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P. F. Wong

**Approved by :**   
Dorothy Cheuk

**Date:** 16-Apr-12

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

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# Calibration Certificate

Certificate No. 22086

Page 2 of 2 Pages

Results :

## 1. Level Accuracy

UUT Setting (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94.0	94.02	± 0.3 dB

Uncertainty : ± 0.1 dB

## 2. Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 942 Class 1 Spec.
1.000	1.000	± 2 %

Uncertainty : ± 3.6 x 10<sup>-6</sup>

3. **Level Stability** : 0.0 dB  
IEC 942 Class 1 Spec.: ± 0.1 dB  
Uncertainty : ± 0.01 dB
4. **Total Harmonic Distortion** : < 2.9 %  
IEC 942 Class 1 Spec. : < 3 %  
Uncertainty : ± 2.3 % of rdg.

- Remark : 1. UUT : Unit-Under-Test  
2. The above measured values were the mean of 3 measurements.  
3. The uncertainty claimed is for a confidence probability of not less than 95%.  
4. Atmospheric Pressure : 1005 hPa.

----- END -----

## **Appendix I**

### **C2**

## **Impact Noise Monitoring Results**

## Day-time Noise Monitoring

Monitoring Location: TKO-N1 (Site Egress)

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L <sub>eq</sub> (30min)	L <sub>10</sub>	L <sub>90</sub>		
07/11/12	09:15	67.4	69.0	62.5	0.7	Cloudy

## Appendix I

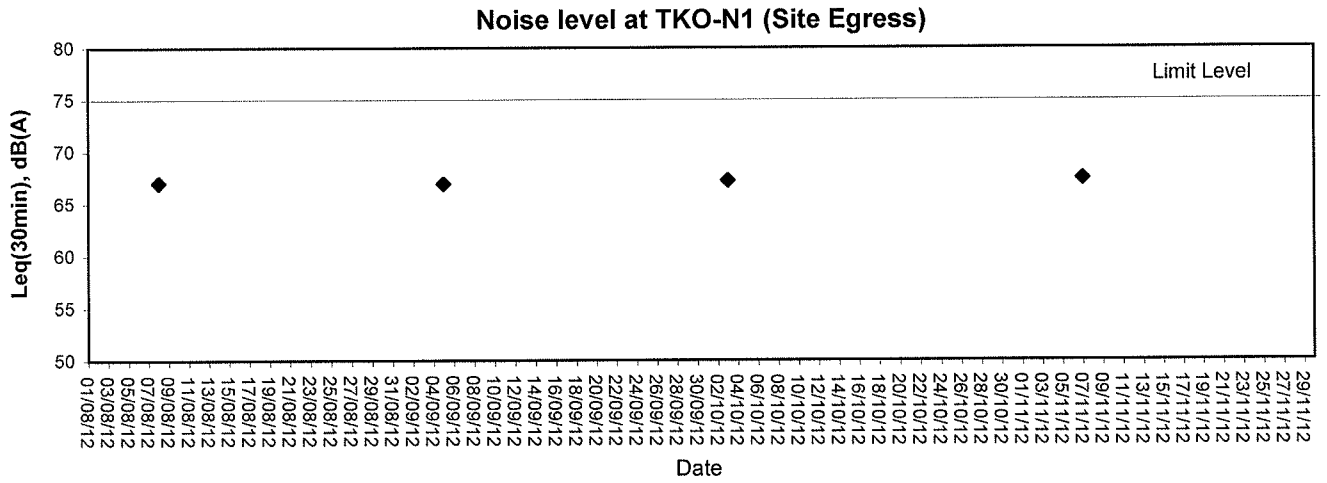
### C3

## Graphical Plots of Impact Noise Monitoring Data





## Noise Monitoring (Day-time)



## **Appendix I**

**D1**

### **Calibration Certificates for Impact Marine Water Quality Monitoring Equipments**



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/004</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>10F 101978</u>
Date of Calibration : <u>13/08/2012</u>	Calibration Due Date : <u>12/11/2012</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/001  
 Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.3	Corrected	19.9
DO Meter reading	Measured	19.9	Difference	0.0

**Standardization of sodium thiosulphate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) solution**

Reagent No. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrant	CPE/012/4.5/001/5	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/9
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		40.10	39.90
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		40.10	39.90
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02494	0.02506
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02500	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 1 / ml Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> used

**Linearity Checking**

**Determination of dissolved oxygen content by Winkler Titration \***

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	10.70	21.20	0.00	7.80	12.60
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.70	21.20	29.10	7.80	12.60	17.40
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.70	10.50	7.90	7.80	4.80	4.80
Dissolved Oxygen (DO), mg/L	7.18	7.05	5.30	5.23	3.22	3.22
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.21	7.16	7.19	7.18	7.05	7.12	0.98
5	5.35	5.28	5.32	5.30	5.23	5.27	0.94
10	3.17	3.21	3.19	3.22	3.22	3.22	0.94
Linear regression coefficient				0.99880			



### Internal Calibration Report of Dissolved Oxygen Meter

**Zero Point Checking**

DO meter reading, mg/L	0.00
------------------------	------

**Salinity Checking**

Reagent No. of NaCl (10ppt)	CPE/012/4.7/001/27	Reagent No. of NaCl (30ppt)	CPE/012/4.8/001/27
-----------------------------	--------------------	-----------------------------	--------------------

**Determination of dissolved oxygen content by Winkler Titration \*\***

Salinity (ppt)	10		30	
	1	2	1	2
Trial				
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.60	23.40	34.10
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.60	23.40	34.10	44.60
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.60	11.80	10.70	10.50
Dissolved Oxygen (DO), mg/L	7.79	7.92	7.18	7.05
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $DO (mg/L) = V \times N \times 8000/298$

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.8	7.84	7.82	7.79	7.92	7.86	0.51
30	7.24	7.2	7.22	7.18	7.05	7.12	1.39

**Acceptance Criteria**

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / unacceptable # for use.

# Delete as appropriate

Calibrated by :

Approved by :



## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/004      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 10F 101978  
Date of Calibration : 13/08/2012      Due Date : 12/11/2012

Ref. No. of Salinity Standard used (30ppt)

S/001/4

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.1	30.4	0.99

Acceptance Criteria

Difference : <10 %

The salinity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by :

Approved by :



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/004</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>10F 101978</u>
Date of Calibration : <u>10/11/2012</u>	Calibration Due Date : <u>09/02/2013</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/001

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.4	Corrected	20.0
DO Meter reading	Measured	19.8	Difference	0.2

**Standardization of sodium thiosulphate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) solution**

Reagent No. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrant	CPE/012/4.5/001/5	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/13
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		40.55	40.50
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		40.55	40.50
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02466	0.02469
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02468	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 1 / ml Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> used

**Lineality Checking**

**Determination of dissolved oxygen content by Winkler Titration \***

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	10.90	21.60	0.00	8.00	12.90
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.90	21.60	29.70	8.00	12.90	17.70
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.90	10.70	8.10	8.00	4.90	4.80
Dissolved Oxygen (DO), mg/L	7.22	7.09	5.37	5.30	3.25	3.18
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.25	7.19	7.22	7.22	7.09	7.16	0.83
5	5.34	5.28	5.31	5.37	5.30	5.34	0.56
10	3.17	3.21	3.19	3.25	3.18	3.22	0.94
Linear regression coefficient				0.99980			



### Internal Calibration Report of Dissolved Oxygen Meter

**Zero Point Checking**

DO meter reading, mg/L	0.00
------------------------	------

**Salinity Checking**

Reagent No. of NaCl (10ppt)	CPE/012/4.7/001/32	Reagent No. of NaCl (30ppt)	CPE/012/4.8/001/32
-----------------------------	--------------------	-----------------------------	--------------------

**Determination of dissolved oxygen content by Winkler Titration \*\***

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.80	23.50	34.40
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.80	23.50	34.40	45.00
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.80	11.70	10.90	10.60
Dissolved Oxygen (DO), mg/L	7.82	7.75	7.22	7.02
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $DO (mg/L) = V \times N \times 8000/298$

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.8	7.84	7.82	7.82	7.75	7.79	0.38
30	7.25	7.2	7.23	7.22	7.02	7.12	1.53

**Acceptance Criteria**

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / unacceptable # for use.

# Delete as appropriate

Calibrated by :

Approved by :



## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/004      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 10F 101978  
Date of Calibration : 10/11/2012      Due Date : 09/02/2013

Ref. No. of Salinity Standard used (30ppt)

S/001/4

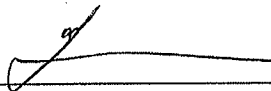
Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.9	30.1	2.62

Acceptance Criteria

Difference : <10 %

The salinity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 





## Performance Check of Turbidimeter

Equipment Ref. No. : ET/0505/009      Manufacturer : HACH  
Model No. : 2100Q      Serial No. : 11060 C 010010  
Date of Calibration : 09/10/2012      Due Date : 08/01/2013

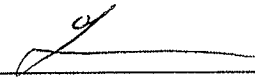
Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.30	5.12	0.86
10-100 NTU	52.0	51.1	0.73
100-1000 NTU	540	532	0.70

Acceptance Criteria

Difference : <5 %

The ~~salinity meter~~ <sup>Turbidimeter</sup> complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 



## **Appendix I**

### **D2**

## **Impact Marine Water Quality Monitoring Results**

# Mid-Flood Tide



東業德動測試顧問有限公司  
ETS-TESTCONSULT LIMITED

Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
02/11/12	1700-1717	25/Fine	Surface	1.0	25.5	26.3	26.3	5.84	5.86	84.7	85.0	3.68	3.69	4.4	4.6	3.70	3.70	4.8	4.6
						26.2		5.88		85.3		3.70		4.8					
						26.4		5.79		83.9		3.74		4.8					
05/11/12	1030-1047	24/Fine	Middle	10.1	25.4	26.5	26.5	5.80	5.80	84.1	84.0	3.76	3.75	4.6	4.7	3.76	3.76	4.6	4.7
						26.8		5.77		83.7		3.89		4.8					
						26.8		5.73		83.1		3.91		4.9					
07/11/12	1200-1218	23/Fine	Bottom	19.2	25.2	26.3	26.3	5.88	5.90	82.9	83.1	3.65	3.67	4.4	4.4	3.65	3.65	4.4	4.4
						26.3		5.91		83.3		3.68		4.4					
						26.4		5.83		82.2		3.71		4.6					
09/11/12	1330-1347	26/Fine	Surface	1.0	25.2	26.5	26.5	5.85	5.84	82.5	82.4	3.73	3.72	4.8	4.7	3.73	3.73	4.8	4.7
						26.5		5.87		82.8		3.72		4.8					
						26.7		5.78		81.5		3.82		4.8					
12/11/12	1530-1548	25/Fine	Bottom	18.8	25.1	26.8	26.8	5.76	5.77	81.8	81.6	3.85	3.86	4.8	4.8	3.84	3.84	5.0	4.9
						26.8		6.06		85.1		3.51		4.2					
						26.3		6.02		84.4		3.47		4.2					
14/11/12	1600-1616	26/Fine	Surface	1.0	24.5	26.5	26.6	5.93	5.96	83.3	83.6	3.59	3.61	4.6	4.7	3.59	3.59	4.6	4.7
						26.6		5.98		83.9		3.62		4.8					
						26.8		5.87		82.4		3.68		4.6					
16/11/12	0730-0747	23/Cloudy	Bottom	17.6	24.5	26.8	26.8	5.83	5.85	81.8	82.1	3.72	3.70	4.8	4.7	3.72	3.70	4.4	4.6
						26.4		6.10		85.1		3.41		4.4					
						26.3		6.08		84.8		3.43		4.6					
16/11/12	0730-0747	23/Cloudy	Middle	9.3	24.4	26.6	26.6	5.91	5.93	82.4	82.7	3.50	3.52	4.6	4.5	3.50	3.54	4.4	4.5
						26.6		5.95		83.0		3.54		4.4					
						26.7		5.82		81.1		3.69		4.4					
16/11/12	0730-0747	23/Cloudy	Bottom	17.6	24.5	26.8	26.8	5.88	5.85	82.0	81.6	3.70	3.70	4.8	4.6	3.70	3.70	4.8	4.6
						26.7		5.94		83.2		3.46		4.4					
						26.7		5.91		82.7		3.41		4.6					
16/11/12	0730-0747	23/Cloudy	Surface	1.0	24.7	26.9	26.9	5.88	5.87	82.3	83.0	3.57	3.44	4.8	4.5	3.57	3.44	4.8	4.5
						26.9		5.85		81.9		3.59		4.6					
						27.1		5.73		80.2		3.82		4.8					
16/11/12	0730-0747	23/Cloudy	Middle	10.1	24.8	27.1	27.1	5.73	5.73	80.2	80.2	3.80	3.81	4.8	4.9	3.80	3.80	5.0	4.9
						27.0		5.96		82.7		3.97		4.8					
						27.0		5.93		82.5		3.97		5.0					
16/11/12	0730-0747	23/Cloudy	Bottom	17.6	24.5	27.1	27.1	5.83	5.85	81.8	81.5	4.08	4.06	5.0	5.1	4.08	4.04	5.0	4.9
						27.1		5.83		81.2		4.17		5.0					
						27.1		5.76		79.5		4.15		5.2					

# Mid-Flood Tide



東業德動測試顧問有限公司  
ETS-TESTCONSULT LIMITED

Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average
19/11/12	1030-1045	22/Cloudy	Surface	24.0	27.3	27.3	6.20	6.18	6.11	86.4	86.1	3.30	3.32	4.4	4.4	4.6	
			Middle	24.2	27.5	27.5	6.02	6.04	6.11	83.9	84.1	3.34	3.52	4.4	4.6		
			Bottom	24.3	27.5	27.5	6.05	6.05	5.96	84.3	83.1	3.50	3.62	4.6	4.7		
21/11/12	1200-1220	24/Cloudy	Surface	24.2	27.4	27.4	5.98	5.96	6.13	82.8	86.4	3.28	3.29	4.4	4.4	4.5	
			Middle	24.2	27.4	27.4	6.22	6.20	6.06	86.0	84.4	3.30	3.51	4.4	4.5		
			Bottom	24.3	27.5	27.5	6.04	6.07	5.98	84.6	83.4	3.48	3.59	4.4	4.6		
23/11/12	1330-1348	22/Cloudy	Surface	24.0	27.3	27.3	6.00	5.96	6.15	83.6	86.2	3.57	3.49	4.4	4.8	4.8	
			Middle	24.1	27.4	27.4	6.19	6.11	6.11	86.1	85.2	3.47	3.66	4.6	4.7		
			Bottom	24.2	27.5	27.5	6.09	6.13	6.02	85.4	83.8	3.63	3.77	4.8	4.9		
26/11/12	1500-1520	19/Cloudy	Surface	23.9	27.3	27.3	5.99	6.04	6.18	84.1	86.5	3.75	3.39	4.4	4.5	4.7	
			Middle	23.9	27.4	27.4	6.20	6.21	6.14	86.3	85.5	3.37	3.56	4.6	4.7		
			Bottom	24.0	27.5	27.5	6.12	6.16	6.08	85.2	84.6	3.40	3.67	4.6	4.9		
28/11/12	1630-1646	20/Cloudy	Surface	23.1	27.1	27.1	6.07	6.08	6.30	84.5	88.2	3.65	3.25	4.4	4.2	4.4	
			Middle	23.0	27.3	27.3	6.38	6.39	6.20	88.0	85.6	3.29	3.42	4.0	4.4		
			Bottom	22.9	27.4	27.4	6.40	6.21	6.02	85.4	83.1	3.41	3.66	4.4	4.7		
30/11/12	1600-1619	21/Drizzle	Surface	23.3	27.0	27.0	6.03	6.46	6.34	83.2	89.5	3.67	3.21	4.0	3.9	4.2	
			Middle	23.4	27.2	27.2	6.48	6.22	6.20	89.8	86.3	3.23	3.32	3.8	4.3		
			Bottom	23.5	27.5	27.5	6.43	6.10	6.10	89.1	84.6	3.19	3.53	4.2	4.5		

# Mid-Flood Tide

Monitoring Station : TKO-M4



東業德動測試顧問有限公司  
ETS-TESTCONSULT LIMITED

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Bottom		Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
02/11/12	1833-1851	25/Fine	Surface	1.0	25.6	26.3	5.81	5.82	5.80	84.2	84.4	3.64	3.62	4.4	4.3	4.7		
					25.4	26.4	5.79	5.79	5.80	84.5	3.60	4.2						
			Middle	4.3	25.4	26.4	5.78	5.79	3.73	3.75	4.6	4.7						
					25.3	26.8	5.70	5.72	3.77	3.97	4.8	5.1						
			Bottom	8.6	25.3	26.8	5.73	5.72	3.99	3.97	5.0	5.1						
					25.4	26.3	5.84	5.85	3.61	3.60	4.6	4.5						
05/11/12	1158-1219	24/Fine	Surface	1.0	25.4	26.3	5.85	5.85	5.83	82.3	82.4	3.58	3.60	4.4	4.5	4.7		
					25.3	26.4	5.81	5.82	5.83	82.5	3.70	4.6	4.7					
			Middle	4.9	25.3	26.4	5.82	5.82	3.74	3.72	4.8	4.7						
					25.2	26.7	5.74	5.76	3.82	3.82	5.0	4.9						
			Bottom	8.8	25.2	26.8	5.77	5.76	3.81	3.82	4.8	4.9						
					25.3	26.3	5.85	5.86	3.59	3.58	4.2	4.3						
07/11/12	1333-1349	23/Fine	Surface	1.0	25.3	26.4	5.87	5.86	5.82	82.5	82.7	3.56	3.58	4.4	4.3	4.6		
					25.2	26.5	5.80	5.79	5.82	82.8	3.68	4.4	4.2					
			Middle	4.5	25.2	26.6	5.80	5.79	3.68	3.69	4.8	4.7						
					25.2	26.7	5.73	5.74	3.77	3.75	4.8	4.7						
			Bottom	8.0	25.2	26.8	5.75	5.74	3.72	3.75	4.6	4.7						
					25.4	26.2	6.01	6.02	5.74	5.74	4.2	4.2						
09/11/12	1500-1515	26/Fine	Surface	1.0	25.4	26.3	6.03	6.02	5.97	84.3	84.5	3.42	3.44	4.2	4.2	4.4		
					25.3	26.3	5.99	5.92	3.46	3.46	4.2	4.2						
			Middle	4.5	25.3	26.4	5.94	5.92	3.56	3.58	4.4	4.6						
					25.2	26.4	5.90	5.83	3.60	3.68	4.8	4.5						
			Bottom	8.0	25.2	26.6	5.85	5.83	3.70	3.68	4.6	4.5						
					24.5	26.4	6.07	6.05	6.00	6.05	4.0	4.1						
12/11/12	1700-1715	25/Fine	Surface	1.0	24.5	26.5	6.03	6.05	6.00	84.7	84.4	3.34	3.35	4.1	4.1	4.5		
					24.3	26.6	5.99	5.95	3.36	3.36	4.2	4.2						
			Middle	4.9	24.3	26.7	5.91	5.95	3.56	3.58	4.4	4.5						
					24.2	26.7	5.91	5.83	3.60	3.68	4.6	4.5						
			Bottom	8.8	24.2	26.8	5.80	5.83	3.72	3.73	4.8	4.9						
					24.8	26.8	5.86	5.83	3.74	3.73	5.0	4.9						
14/11/12	1725-1741	26/Fine	Surface	1.0	24.8	26.8	5.83	5.83	5.80	81.6	81.6	3.42	3.47	4.3	4.3	4.6		
					24.8	26.8	5.82	5.78	5.80	81.5	3.51	4.4	4.3					
			Middle	4.7	24.8	26.9	5.79	5.78	3.63	3.66	4.6	4.7						
					24.9	26.9	5.77	5.70	3.69	3.74	4.8	4.7						
			Bottom	8.3	24.9	27.0	5.70	5.70	3.76	3.74	4.6	4.7						
					24.1	27.0	5.69	6.45	4.02	4.04	4.8	4.9						
16/11/12	0902-0917	23/Cloudy	Surface	1.0	24.1	27.7	6.43	6.45	6.39	90.2	89.9	4.05	4.04	4.9	4.9	5.0		
					24.1	27.7	6.30	6.32	4.15	4.18	5.2	5.3						
			Middle	4.5	24.1	27.7	6.34	6.32	4.20	4.24	5.4	5.3						
					24.2	27.7	6.13	6.12	4.22	4.24	4.8	4.9						
			Bottom	7.9	24.2	27.8	6.10	6.12	4.25	4.24	5.0	4.9						
					24.2	27.8	6.10	6.12	4.25	4.24	5.0	4.9						

# Mid-Flood Tide

## Monitoring Station : TKO-M4

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/11/12	1205-1220	22/Cloudy	Surface	24.2	27.4	27.4	6.17	6.16	6.11	86.0	85.8	3.21	3.23	4.0	4.1	4.4		
			Middle	24.3	27.5	27.5	6.04	6.06	6.11	84.2	84.4	3.25	3.39	4.2	4.5			
			Bottom	24.3	27.5	27.5	5.88	5.87	5.87	81.9	81.7	3.37	3.40	4.4	4.6			
21/11/12	1335-1351	24/Cloudy	Surface	24.3	27.5	27.5	5.85	6.18	6.13	81.5	86.1	3.54	3.21	4.0	4.1	4.4		
			Middle	24.4	27.5	27.5	6.06	6.08	6.13	84.5	84.7	3.18	3.35	4.2	4.5			
			Bottom	24.4	27.5	27.5	5.90	5.89	5.89	84.9	82.0	3.34	3.49	4.4	4.6			
23/11/12	1500-1515	22/Cloudy	Surface	24.1	27.3	27.4	6.16	6.15	6.12	82.2	85.7	3.47	3.34	4.4	4.3	4.6		
			Middle	24.1	27.4	27.4	6.08	6.10	6.12	85.3	85.0	3.51	3.54	4.4	4.7			
			Bottom	24.2	27.4	27.4	5.87	6.12	5.99	83.8	83.5	3.36	3.69	4.6	4.9			
26/11/12	1635-1651	19/Cloudy	Surface	23.9	27.4	27.4	6.19	6.18	6.16	83.1	86.0	3.70	3.24	4.2	4.1	4.4		
			Middle	24.0	27.5	27.5	6.13	6.14	6.16	85.7	85.5	3.22	3.45	4.0	4.5			
			Bottom	24.0	27.5	27.5	6.03	6.01	6.01	85.6	83.7	3.47	3.59	4.4	4.7			
28/11/12	1808-1825	20/Cloudy	Surface	23.0	27.0	27.0	6.34	6.36	6.29	83.9	87.8	3.61	3.23	4.2	4.3	4.4		
			Middle	23.0	27.1	27.1	6.20	6.21	6.29	88.2	85.7	3.22	3.30	4.2	4.3			
			Bottom	23.0	27.2	27.3	6.11	6.12	6.12	85.8	84.5	3.29	3.49	4.4	4.6			
30/11/12	1736-1751	21/Drizzle	Surface	23.3	27.0	27.1	6.36	6.35	6.30	84.6	88.0	3.50	3.15	4.0	4.1	4.3		
			Middle	23.3	27.1	27.1	6.33	6.25	6.30	88.2	86.6	3.17	3.30	4.2	4.3			
			Bottom	23.4	27.1	27.1	6.07	6.09	6.09	86.4	84.4	3.28	3.49	4.2	4.4			

**Mid-Ebb Tide**

**Monitoring Station : TKO-C1**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
02/11/12	1200-1217	22/Fine	Surface	1.0	25.4	26.2	5.81	5.80	84.2	84.0	3.62	3.65	4.8	4.7	3.74	3.74	4.8	4.8	4.9
					26.3	5.78	83.8	3.67	4.6										
			Middle	9.8	25.3	26.5	5.76	5.75	83.5	83.3	3.69	3.71	4.8	4.8					
					26.5	5.73	83.1	3.73	4.8										
			Bottom	18.5	25.2	26.7	5.70	5.70	82.7	82.7	3.82	3.87	5.0	5.1					
					26.8	5.69	82.6	3.91	5.2										
05/11/12	1500-1518	25/Fine	Surface	1.0	25.4	26.3	5.82	5.80	82.1	81.8	3.76	3.75	4.6	4.7	3.86	3.86	4.6	4.7	4.8
					26.4	5.78	81.5	3.73	4.8										
			Middle	9.7	25.2	26.5	5.75	5.73	81.0	80.8	3.85	3.87	4.6	4.7					
					26.5	5.71	80.5	3.89	4.8										
			Bottom	18.4	25.1	26.7	5.68	5.66	80.0	79.8	3.96	3.97	5.0	5.0					
					26.8	5.64	79.5	3.98	5.0										
07/11/12	1700-1717	24/Fine	Surface	1.0	25.4	26.4	5.91	5.87	83.3	82.8	3.51	3.54	4.2	4.3	3.63	3.63	4.2	4.3	4.5
					26.4	5.83	82.2	3.56	4.4										
			Middle	9.4	25.3	26.5	5.80	5.79	81.8	81.7	3.62	3.61	4.6	4.5					
					26.6	5.78	81.5	3.59	4.4										
			Bottom	17.8	25.2	26.8	5.77	5.75	81.4	81.1	3.73	3.75	4.8	4.7					
					26.8	5.73	80.8	3.76	4.6										
09/11/12	0730-0745	24/Fine	Surface	1.0	25.2	26.3	5.98	5.97	83.9	83.7	3.66	3.63	4.2	4.3	3.72	3.72	4.2	4.3	4.6
					26.4	5.95	83.5	3.59	4.4										
			Middle	9.7	25.1	26.6	5.83	5.82	82.1	81.8	3.70	3.69	4.6	4.5					
					26.6	5.80	81.4	3.68	4.4										
			Bottom	18.4	25.0	26.8	5.76	5.76	80.8	80.8	3.81	3.83	4.8	4.9					
					26.8	5.75	80.7	3.85	5.0										
12/11/12	0930-0948	23/Fine	Surface	1.0	24.3	26.4	5.92	5.94	82.5	82.9	3.69	3.71	4.4	4.6	3.78	3.78	4.4	4.6	4.7
					26.4	5.96	83.2	3.72	4.8										
			Middle	9.6	24.2	26.5	5.85	5.83	81.5	81.2	3.74	3.76	4.8	4.7					
					26.6	5.81	80.9	3.78	4.6										
			Bottom	18.2	24.0	26.7	5.73	5.75	79.9	80.2	3.84	3.87	4.6	4.8					
					26.8	5.77	80.4	3.89	5.0										
14/11/12	1100-1118	25/Cloudy	Surface	1.0	24.6	26.7	5.84	5.86	81.8	82.1	3.71	3.73	4.6	4.6	3.80	3.80	4.6	4.6	4.8
					26.7	5.88	82.3	3.74	4.6										
			Middle	9.6	24.6	26.7	5.80	5.79	81.2	81.1	3.76	3.78	4.8	4.9					
					26.8	5.78	80.9	3.80	4.8										
			Bottom	18.2	24.7	26.8	5.70	5.69	79.8	79.6	3.86	3.89	4.8	4.9					
					26.8	5.67	79.4	3.91	5.0										
16/11/12	1300-1315	25/Cloudy	Surface	1.0	24.3	27.1	6.16	6.15	86.1	85.9	3.28	3.27	4.4	4.3	4.15	4.15	4.4	4.3	5.1
					27.0	6.13	85.7	3.25	4.2										
			Middle	8.7	24.3	27.2	6.25	6.23	87.2	86.9	4.95	4.93	5.6	5.7					
					27.2	6.20	86.5	4.90	5.8										
			Bottom	16.4	24.3	27.2	6.29	6.31	87.8	88.0	4.23	4.26	5.2	5.3					
					27.2	6.33	88.2	4.29	5.4										

# Mid-Ebb Tide

## Monitoring Station : TKO-C1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)		Turbidity (NTU)			Suspended Solids (mg/L)	
			Surface	Bottom		Value	Average	Value	Average	Value	Average	Value	Average	Value	Depth-average	Value	Average
19/11/12	1530-1547	23/Fine	Surface	1.0	24.4	27.0	27.0	6.10	6.08	85.1	84.8	3.92	3.94	4.8	4.8	5.0	5.0
			Middle	9.9	24.5	27.1	27.2	6.06	5.96	84.5	83.1	3.96	4.13	4.8	5.1		
			Bottom	18.8	24.6	27.2	27.3	5.94	5.86	83.3	81.7	4.14	4.23	5.0	5.2		
21/11/12	1730-1747	23/Drizzle	Surface	1.0	24.1	27.3	27.3	6.15	6.14	81.4	85.5	4.21	3.31	4.2	4.3	4.6	4.6
			Middle	9.9	24.2	27.3	27.4	6.12	6.02	81.9	83.9	4.25	3.53	4.2	4.7		
			Bottom	18.8	24.3	27.4	27.5	5.88	5.98	83.8	83.4	3.31	3.64	4.6	4.7		
23/11/12	0730-0747	24/Cloudy	Surface	1.0	24.0	27.3	27.4	6.14	6.12	83.5	85.3	3.62	3.36	4.2	4.3	4.6	4.6
			Middle	9.8	24.1	27.4	27.4	6.10	6.01	83.2	83.8	3.37	3.59	4.4	4.7		
			Bottom	18.6	24.1	27.4	27.5	5.97	5.97	83.6	83.3	3.57	3.68	4.6	4.7		
26/11/12	0930-0948	19/Cloudy	Surface	1.0	23.8	27.3	27.4	6.15	6.16	83.4	85.8	3.67	3.44	4.2	4.3	4.6	4.6
			Middle	10.2	23.9	27.4	27.4	6.17	6.09	83.1	84.8	3.45	3.61	4.2	4.7		
			Bottom	19.4	24.0	27.4	27.5	6.07	6.00	83.1	83.5	3.63	3.72	4.6	4.9		
28/11/12	1100-1116	18/Cloudy	Surface	1.0	23.0	27.1	27.1	6.34	6.31	83.8	87.3	3.70	3.29	4.2	4.3	4.4	4.4
			Middle	10.3	23.0	27.3	27.4	6.27	6.15	87.8	85.1	3.27	3.48	4.2	4.4		
			Bottom	19.6	22.9	27.5	27.5	6.16	5.97	85.3	82.7	3.50	3.74	4.4	4.5		
30/11/12	1200-1217	25/Drizzle	Surface	1.0	23.2	27.0	27.1	6.30	6.32	82.4	87.6	3.71	3.36	4.2	4.3	4.5	4.5
			Middle	10.3	23.4	27.3	27.4	6.34	6.11	87.3	84.6	3.34	3.49	4.2	4.5		
			Bottom	19.6	23.6	27.6	27.6	6.12	5.94	84.3	82.2	3.47	3.69	4.4	4.8		





**Mid-Ebb Tide**

**Monitoring Station : TKO-M4**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)			
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value
02/11/12	1332-1350	22/Fine	Surface	1.0	25.5	26.2	26.2	5.79	5.79	83.4	83.6	3.71	3.70	4.6	4.7	3.84	3.70	4.6	4.7	4.9
			Middle	4.4	25.3	26.4	26.5	5.74	5.74	83.2	83.2	3.69	3.84	4.8	4.9			4.8	4.9	
			Bottom	7.8	25.2	26.5	26.8	5.73	5.69	83.1	82.5	3.81	3.99	5.0	5.2			5.2	5.2	
05/11/12	1633-1649	25/Fine	Surface	1.0	25.4	26.3	26.3	5.80	5.78	81.8	81.5	3.67	3.69	4.4	4.6	3.81	3.80	4.4	4.6	4.8
			Middle	4.7	25.4	26.4	26.3	5.70	5.72	80.3	80.6	3.78	3.80	4.8	4.7			4.8	4.6	
			Bottom	8.4	25.3	26.7	26.7	5.69	5.68	80.2	80.0	3.91	3.93	5.0	5.1			5.2	5.2	
07/11/12	1801-1820	24/Fine	Surface	1.0	25.5	26.5	26.5	5.88	5.87	82.9	82.8	3.63	3.65	4.4	4.6	3.74	3.74	4.4	4.6	4.8
			Middle	4.1	25.3	26.6	26.6	5.82	5.81	82.1	82.0	3.72	3.74	4.8	4.8			4.8	4.8	
			Bottom	7.2	25.2	26.7	26.8	5.79	5.78	81.6	81.4	3.82	3.83	5.0	5.1			5.2	5.2	
09/11/12	0855-0911	24/Fine	Surface	1.0	25.2	26.3	26.3	5.94	5.92	83.3	83.1	3.53	3.57	4.2	4.3	3.69	3.69	4.2	4.3	4.7
			Middle	4.4	25.1	26.5	26.5	5.81	5.81	81.5	81.5	3.68	3.69	4.8	4.7			4.4	4.4	
			Bottom	7.7	25.0	26.5	26.8	5.80	5.73	81.4	80.4	3.69	3.81	4.6	5.0			4.8	4.8	
12/11/12	1101-1116	23/Fine	Surface	1.0	24.4	26.2	26.3	5.85	5.87	80.3	81.9	3.83	3.63	4.2	4.3	3.74	3.74	4.2	4.3	4.6
			Middle	4.5	24.4	26.3	26.3	5.82	5.80	81.1	80.9	3.72	3.74	4.4	4.5			4.4	4.4	
			Bottom	8.0	24.3	26.4	26.5	5.78	5.73	80.6	79.9	3.76	3.84	4.6	5.0			4.8	4.8	
14/11/12	1233-1249	25/Cloudy	Surface	1.0	24.8	26.7	26.7	5.71	5.83	81.3	81.6	3.81	3.65	4.4	4.6	3.76	3.65	4.4	4.6	4.8
			Middle	4.3	24.9	26.7	26.7	5.85	5.75	81.9	80.5	3.64	3.73	4.8	4.9			4.8	4.8	
			Bottom	7.6	24.9	26.8	26.9	5.77	5.70	80.8	79.9	3.69	3.90	5.0	4.9			5.0	4.8	
16/11/12	1408-1424	25/Cloudy	Surface	1.0	24.1	27.7	27.7	6.53	6.56	91.2	91.6	4.21	4.19	5.2	5.2	4.14	4.19	5.2	5.2	5.3
			Middle	4.2	24.1	27.7	27.7	6.58	6.62	91.9	92.3	4.17	4.36	5.2	5.3			5.2	5.2	
			Bottom	7.4	24.1	27.7	27.7	6.60	6.59	92.0	92.0	4.34	3.88	5.4	5.0			4.8	4.8	



**Mid-Ebb Tide**

**Monitoring Station : TKO-M4**

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
19/11/12	1658-1713	23/Fine	Surface	24.3	27.5	6.38	6.40	89.0	89.3	4.12	4.11	5.2	5.0	5.2				
				24.3	27.6	6.42	6.31	89.5	88.0	4.09	4.22	4.8	5.1					
			Middle	24.3	27.6	6.29	6.33	87.7	88.0	4.24	4.20	5.2	5.0		4.21			
				24.4	27.6	6.15	6.13	85.7	85.4	4.28	4.30	5.2	5.4					
			Bottom	24.4	27.7	6.11	6.13	85.1	85.4	4.31	4.30	5.6	5.4		4.2			
				24.0	27.5	6.14	6.12	85.6	85.3	3.25	3.26	4.0	4.2					
21/11/12	1858-1913	23/Drizzle	Surface	24.1	27.4	6.10	6.05	85.0	84.3	3.27	3.40	4.4	4.5	3.40				
				24.1	27.5	6.03	6.05	84.1	84.3	3.38	3.40	4.4	4.5					
			Middle	24.2	27.4	6.06	6.04	84.5	84.3	3.41	3.42	4.6	4.6		3.43			
				24.2	27.5	5.85	5.84	81.5	81.4	3.53	3.56	4.6	4.7					
			Bottom	24.2	27.5	5.83	5.80	81.3	80.9	3.58	3.59	4.8	4.7		4.2			
				24.1	27.4	6.12	6.10	85.3	85.1	3.26	3.28	4.0	4.2					
23/11/12	0858-0913	24/Cloudy	Surface	24.2	27.5	5.81	5.80	81.0	80.9	3.56	3.59	4.6	4.7	4.5				
				24.2	27.5	5.79	5.80	80.7	80.9	3.61	3.59	4.8	4.7					
			Middle	24.2	27.4	6.08	6.05	84.8	84.3	3.29	3.42	4.4	4.5		3.43			
				24.2	27.5	6.05	6.05	84.3	84.3	3.40	3.42	4.4	4.5					
			Bottom	24.2	27.5	5.81	5.80	81.0	80.9	3.56	3.59	4.6	4.7		4.2			
				23.9	27.4	6.14	6.13	85.5	85.3	3.32	3.30	4.2	4.1					
26/11/12	1100-1115	19/Cloudy	Surface	24.0	27.4	6.11	6.09	85.1	84.8	3.27	3.50	4.0	4.5	4.5				
				24.0	27.5	6.08	6.09	84.6	84.8	3.52	3.50	4.4	4.5					
			Middle	24.0	27.4	6.10	6.09	84.6	84.8	3.48	3.50	4.6	4.5		3.48			
				24.0	27.5	5.98	5.96	83.2	83.0	3.63	3.65	4.8	4.8					
			Bottom	24.0	27.5	5.94	5.96	82.7	83.0	3.66	3.65	4.8	4.8		4.2			
				22.9	27.0	6.30	6.33	87.2	87.6	3.16	3.19	4.0	4.2					
28/11/12	1235-1253	18/Cloudy	Surface	23.0	27.1	6.36	6.20	88.0	85.8	3.21	3.40	4.4	4.4	4.4				
				23.0	27.2	6.21	6.20	86.0	85.8	3.37	3.40	4.4	4.4					
			Middle	23.0	27.1	6.18	6.04	85.5	83.6	3.42	3.61	4.4	4.7		3.40			
				23.0	27.3	6.06	6.04	83.9	83.6	3.58	3.61	4.6	4.7					
			Bottom	23.0	27.3	6.02	6.04	83.3	83.6	3.63	3.61	4.8	4.7		4.4			
				23.2	27.1	6.24	6.26	86.4	86.6	3.25	3.26	4.0	4.2					
30/11/12	1342-1400	25/Drizzle	Surface	23.3	27.3	6.27	6.13	86.8	84.9	3.27	3.38	4.4	4.5	4.5				
				23.3	27.3	6.15	6.13	85.2	84.9	3.36	3.38	4.4	4.5					
			Middle	23.4	27.3	6.11	6.01	84.6	83.3	3.40	3.56	4.6	4.7		3.40			
				23.4	27.5	6.03	6.01	83.5	83.3	3.54	3.56	4.6	4.7					
			Bottom	23.4	27.5	5.99	6.01	83.0	83.3	3.58	3.56	4.8	4.7		4.2			
				23.4	27.5	5.99	6.01	83.0	83.3	3.58	3.56	4.8	4.7					

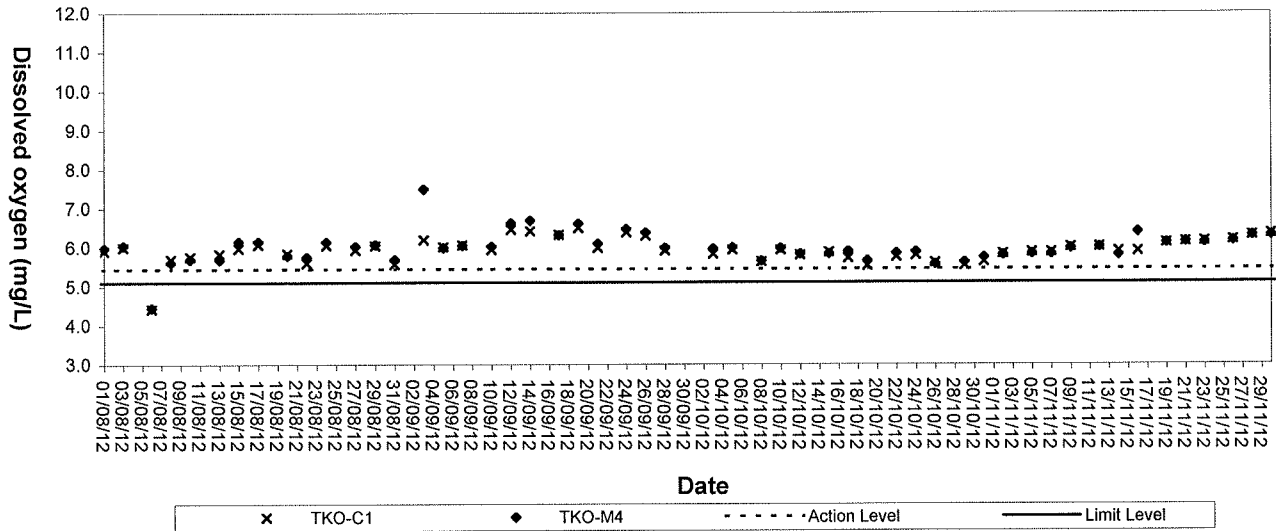
## **Appendix I**

### **D3**

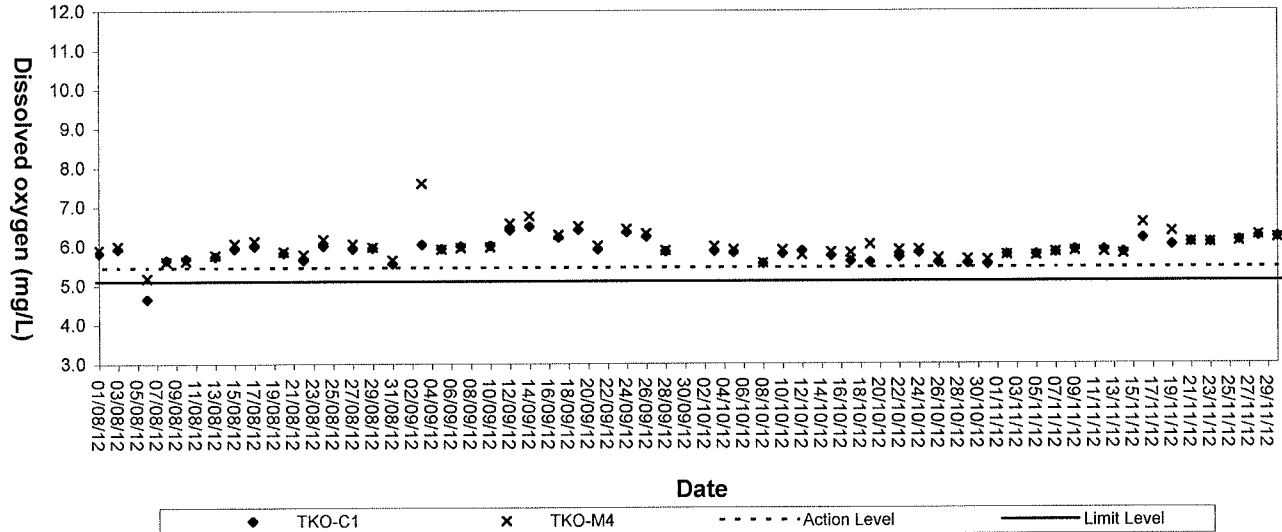
## **Graphical Plots of Impact Marine Water Quality Monitoring Data**



### Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

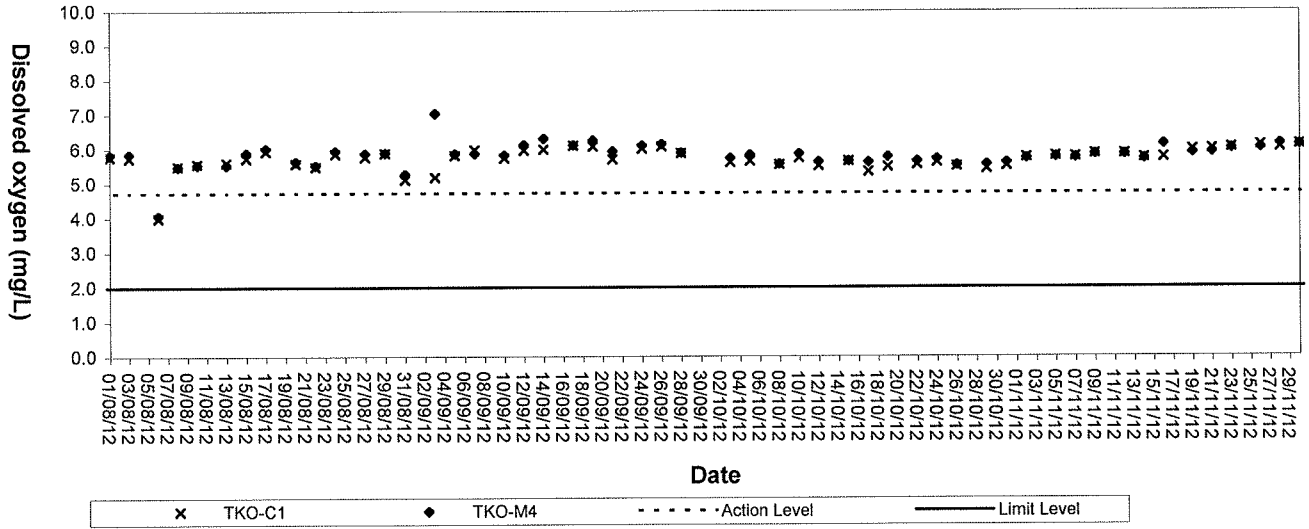


### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

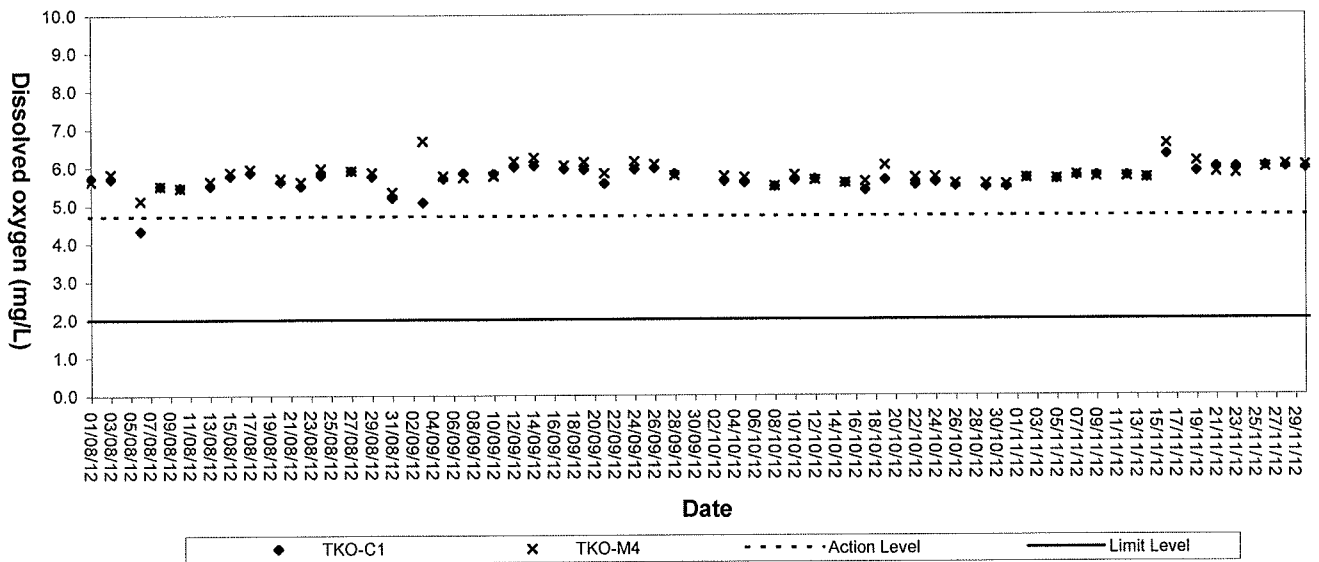




### Dissolved Oxygen (Bottom) at Mid-Flood Tide

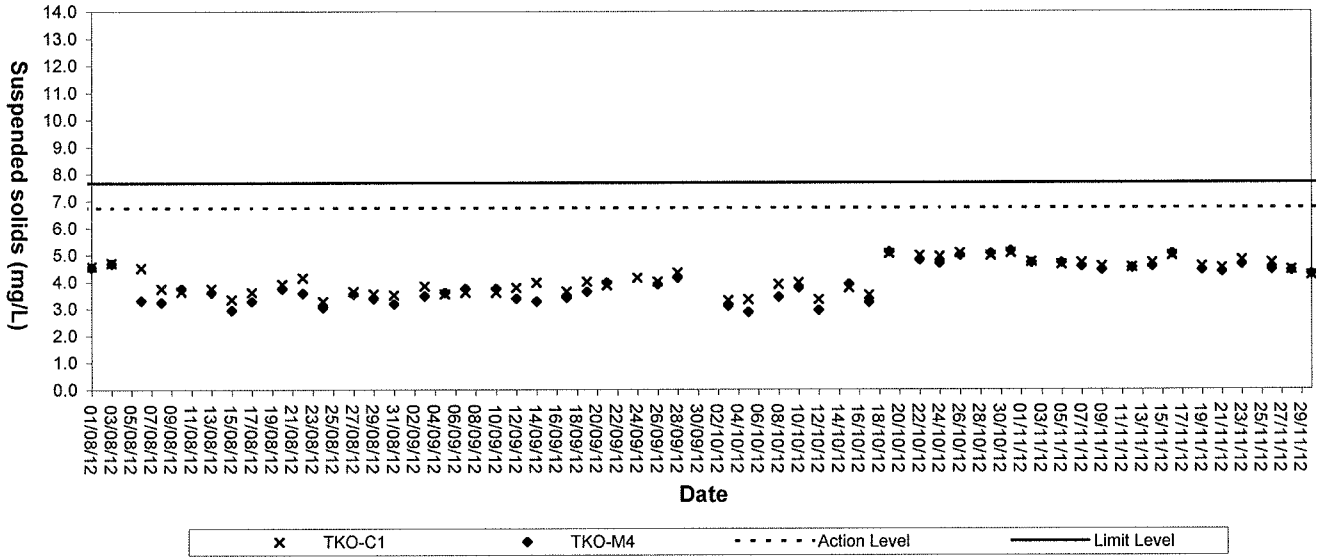


### Dissolved Oxygen (Bottom) at Mid-Ebb Tide

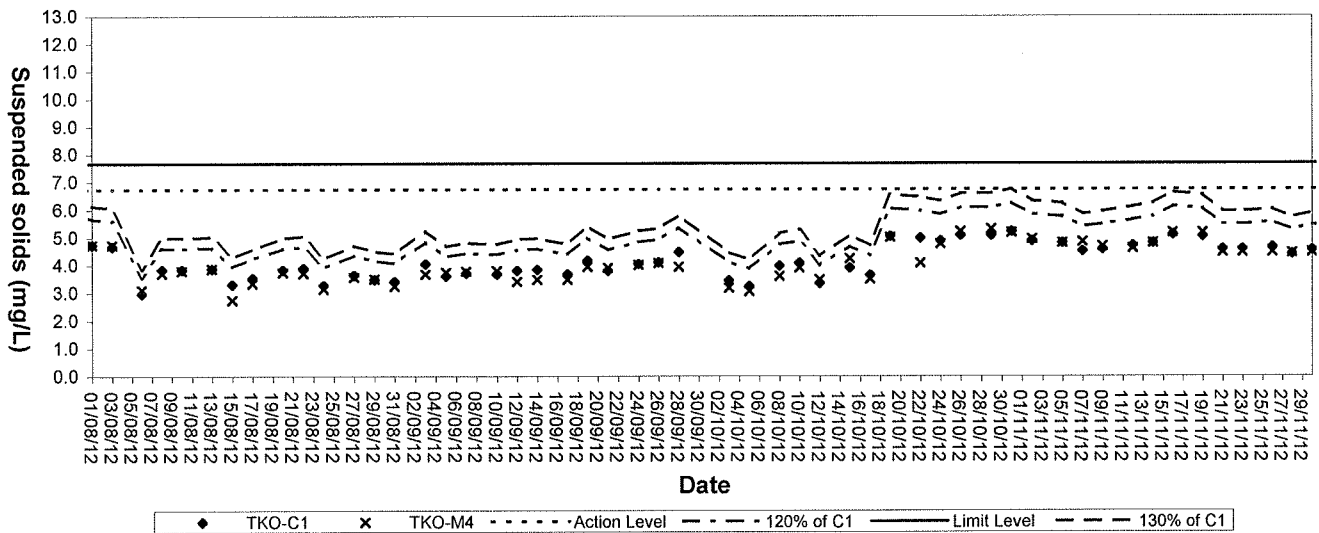




### Suspended solids (Depth-average) at Mid-Flood Tide

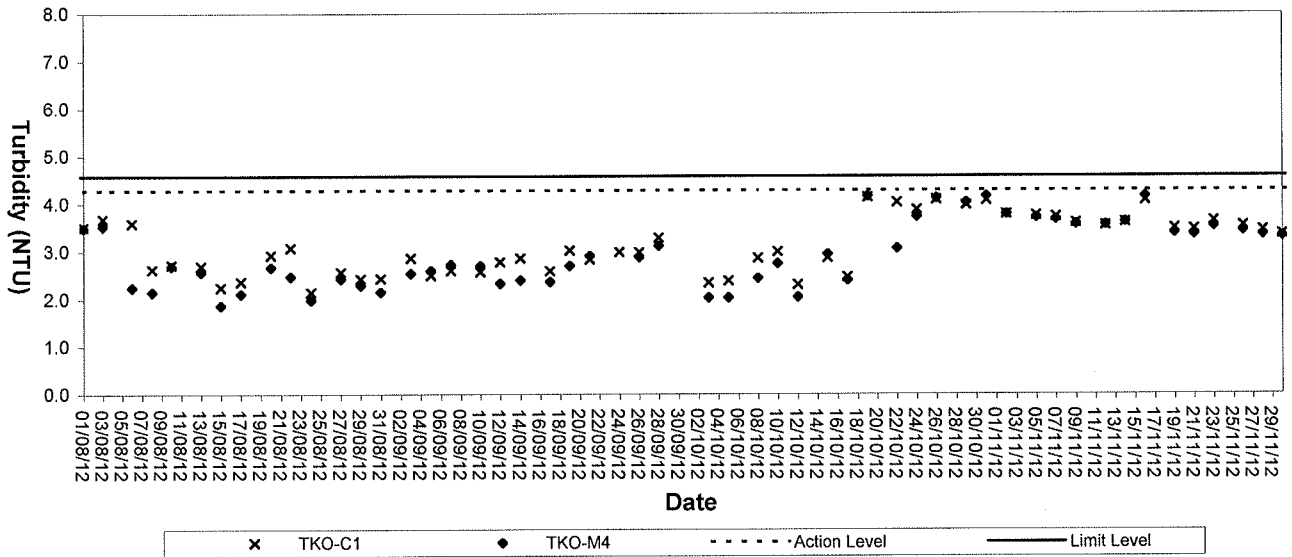


### Suspended Solids (Depth-average) at Mid-Ebb Tide

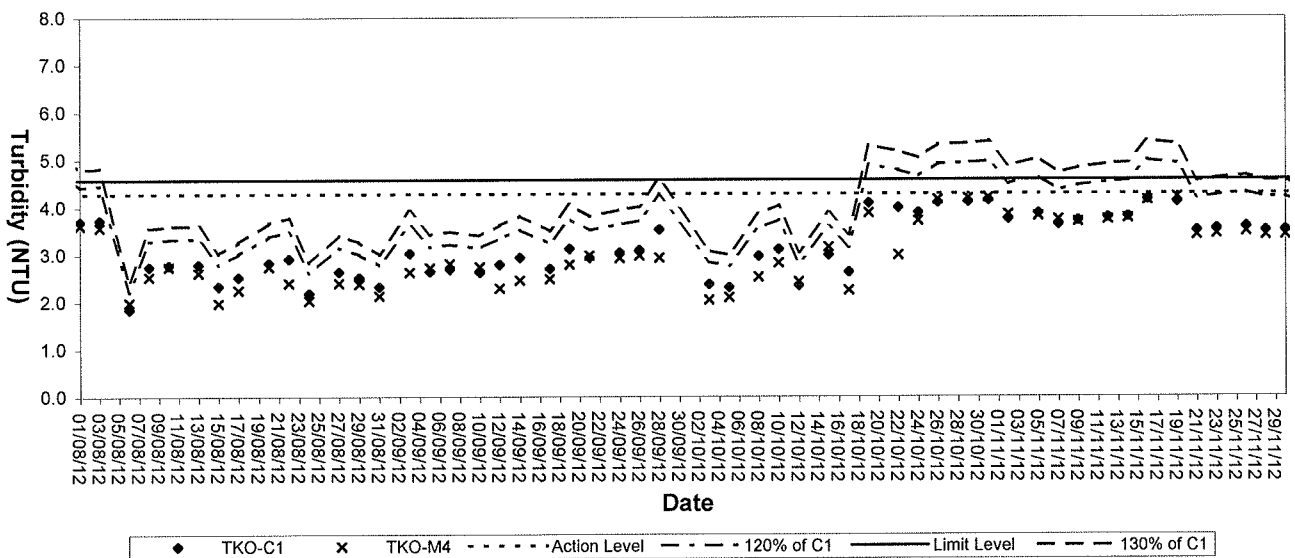




### Turbidity (Depth-average) at Mid-Flood Tide



### Turbidity (Depth-average) at Mid-Ebb Tide



## Appendix I

### E

## Weather Condition



## Extract of Meteorological Observations for Tseung Kwan O Automatic Weather Station, November 2012

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Nov 1	*****	25.6	20.0	15.4	13.0	88	65	40
Nov 2	*****	26.6	22.0	18.7	16.6	89	73	50
Nov 3	*****	25.3	22.7	20.5	18.8	95	80	62
Nov 4	*****	29.1	22.9	19.5	16.8	97	71	43
Nov 5	*****	27.1	23.0	19.7	17.5	86	72	56
Nov 6	*****	27.5	23.2	19.8	16.5	88	67	44
Nov 7	*****	25.0	22.9	22.0	18.2	81	75	65
Nov 8	*****	25.1	23.1	22.3	20.2	93	84	74
Nov 9	*****	27.8	24.9	23.1	22.6	95	87	74
Nov 10	*****	28.6	24.9	22.6	23.0	97	90	72
Nov 11	*****	26.2	21.9	19.5	15.5	98	67	54
Nov 12	*****	23.8	21.1	19.2	16.4	88	75	62
Nov 13	*****	28.2	21.9	17.9	18.1	96	81	51
Nov 14	*****	26.5	22.5	19.7	18.7	97	80	51
Nov 15	*****	23.1	22.6	22.1	19.0	87	80	73
Nov 16	*****	23.5	22.6	22.0	19.3	93	82	76
Nov 17	*****	22.2	19.4	17.9	15.9	94	81	64
Nov 18	*****	20.4	18.9	17.6	17.1	95	89	79
Nov 19	*****	24.8	21.4	19.6	17.2	89	78	58
Nov 20	*****	22.7	21.3	20.1	18.1	92	82	66
Nov 21	*****	22.3	21.8	21.1	21.0	99	95	89
Nov 22	*****	29.2	24.7	21.6	23.1	99	92	70
Nov 23	*****	25.3	21.0	17.4	18.9	97	88	67
Nov 24	*****	20.1	18.5	16.2	16.0	97	86	73
Nov 25	*****	21.6	20.5	19.4	20.2	99	98	96
Nov 26	*****	22.1	17.8	14.3	16.5	99	93	76
Nov 27	*****	17.7	15.4	13.6	14.8	98	96	92
Nov 28	*****	19.6	18.5	16.6	18.0	99	96	90
Nov 29	*****	20.3	19.5	19.0	19.1	99	97	92
Nov 30	*****	21.1	20.1	19.4	19.8	99	98	97
<b>Mean</b>	*****	24.3	21.4	19.3	18.2	94	83	69
<b>Maximum</b>	*****	29.2	24.9	23.1	23.1	99	98	97
<b>Minimum</b>	*****	17.7	15.4	13.6	13.0	81	65	40

## Extract of Meteorological Observations for Tseung Kwan O Automatic Weather Station, November 2012

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Nov 1	0.0	070	6.5
Nov 2	0.0	030	6.4
Nov 3	0.0	030	8.7
Nov 4	0.0	060	6.5
Nov 5	0.0	060	6.0
Nov 6	0.0	150	5.9
Nov 7	0.0	070	7.9
Nov 8	0.0	070	6.3
Nov 9	0.0	120	6.3
Nov 10	0.0	200	3.7
Nov 11	0.0	070	10.6
Nov 12	0.0	060	5.8
Nov 13	0.0	200	4.6
Nov 14	0.0	020	6.1
Nov 15	0.0	080	9.5
Nov 16	0.0	060	9.0
Nov 17	3.0	070	8.8
Nov 18	0.5	040	5.5
Nov 19	0.0	020	5.9
Nov 20	0.5	050	7.9
Nov 21	4.0	360	5.5
Nov 22	1.0	180	3.5
Nov 23	16.0	340	6.1
Nov 24	0.5	060	8.0
Nov 25	19.0	040	6.5
Nov 26	2.0	070	5.8
Nov 27	15.5	010	8.5
Nov 28	2.0	010	5.7
Nov 29	6.5	080	4.6
Nov 30	3.5	360	5.1
<b>Mean</b>	-----	070	6.6
<b>Total</b>	74.0	---	-----
<b>Maximum</b>	19.0	---	10.6
<b>Minimum</b>	0.0	---	3.5

\*\*\* unavailable

# missing (less than 24 hourly observations a day)

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

## **Appendix I**

### **F**

#### **Event-Action Plans**

# EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

## ACTION

	ET Leader	IC(E)	ER	Contractor
	<b>ACTION LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>Inform ER, IC(E) and Contractor</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by the ET</li> <li>Check contractor's working method</li> </ol>	<ol style="list-style-type: none"> <li>Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>Rectify any unacceptable practise</li> <li>Amend working methods if appropriate</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>Inform IC(E) and Contractor</li> <li>Repeat measurements to confirm finding</li> <li>Increase monitoring frequency to daily</li> <li>Discuss with IC(E) and Contractor on remedial actions</li> <li>If exceedance continues, arrange meeting with IC(E) and ER.</li> <li>If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by the ET</li> <li>Check the Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise the ER on the effectiveness of the proposed remedial measures</li> <li>Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify the Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate</li> </ol>
	<b>LIMIT LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>Inform ER, Contractor and EPD</li> <li>Repeat measurement to confirm finding</li> <li>Increase monitoring frequency to daily</li> <li>Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by the ET</li> <li>Check Contractor's working method</li> <li>Discuss with ET and Contractor on possible remedial measures</li> <li>Advise the ER on the effectiveness of the proposed remedial measures</li> <li>Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing</li> <li>Notify the Contractor</li> <li>Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>Take immediate action to avoid further exceedance</li> <li>Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>Implement the agreed proposals</li> <li>Amend proposal if appropriate.</li> </ol>

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			Contractor
	ET Leader	IC(E)	ER	
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Notify IC(E), ER, EPD and Contractor</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Carry out analysis of contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. If exceedances continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedances</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant activity of works as determined by the ER until the exceedance is abated</li> </ol>

## EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

### ACTION

EVENT	ET Leader	IC(E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify the IC(E) and the Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IC(E) and the Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures.</li> <li>5. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IC(E).</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the IC(E), the ER, the EPD and the Contractor.</li> <li>2. Identify source.</li> <li>3. Repeat measurement to confirm findings.</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>6. Inform the IC(E), the ER and the EPD the causes &amp; actions taken for the exceedances.</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep the IC(E), the EPD and the ER informed of the results</li> <li>8. If exceedance due to the construction works stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions.</li> <li>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedances continue, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedances is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Resubmit proposals if problem still not under control.</li> <li>5. Stop the relevant activity of works as determined by the ER until the exceedances is abated.</li> </ol>

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION		
	ET Leader	Contractor	ER IEC
<p>Action level being exceeded by one sampling day</p>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days</li> <li>8. Repeat measurement on next day of exceedance if exceedance is due to the construction works</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify the ER and IEC in writing within 24 hours of identification of exceedance</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Consider changes of working method if exceedance is due to the construction works</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the mitigation measure</li> </ol>
			<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures</li> <li>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>5. Supervise the implementation of mitigation measures</li> </ol>

## EVENT AND ACTION PLAN FOR WATER QUALITY

Event	ACTION			IEC
	ET Leader	Contractor	ER	
<p>Action level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Repeat in-situ measurement to confirm findings</li> <li>3. Notify Contractor in writing within 24 hours of identification</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with IEC and Contractor within 4 working of identification of an exceedance</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Prepare to increase the monitoring frequency to daily;</li> <li>10. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify IEC and ER in writing within 24 hours of identification of exceedance</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the mitigation measure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures.</li> <li>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>



## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION		
	ET Leader	Contractor	ER IEC
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings; Identify source(s) of impact;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with IEC, ER and Contractor within 4 working of identification of an exceedance</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify IEC and ER in writing; within 24 hours of the identification of the exceedance</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of the identification of an exceedance</li> <li>7. Implement the agreed mitigation measures within reasonable time scale</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>4. Ensure remedial measures are properly implemented</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>
			<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ET, ER and Contractor on the mitigation measures.</li> <li>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.</li> <li>5. Assess the effectiveness of the implemented mitigation measures</li> </ol>

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			IEC
	ET Leader	Contractor	ER	
Limit Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Identify source(s) of impact;</li> <li>3. Notify Contractor in writing within 24 hours of identification of the exceedance</li> <li>4. Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>5. Carry out investigation</li> <li>6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works</li> <li>7. Discuss mitigation measures with IEC, ER and Contractor;</li> <li>8. Ensure mitigation measures are implemented;</li> <li>9. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify ER and IEC in writing within 24 hours of the identification of the exceedance and</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>8. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance</li> <li>5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days;</li> <li>6. Implement the agreed mitigation measures within reasonable time scale</li> <li>7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance</li> <li>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;</li> <li>3. Request Contractor to critically review the working methods;</li> <li>6. Ensure remedial measures are properly implemented</li> <li>4. Assess the effectiveness of the implemented mitigation measures;</li> <li>5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET</li> <li>2. Confirm ET assessment if exceedance is due / not due to the works</li> <li>3. Discuss with ER, ET and Contractor on the mitigation measures.</li> <li>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.</li> <li>5. Assess the effectiveness of the implemented mitigation measures.</li> </ol>



## **Appendix I**

### **G**

## **Works Programme**

Master Programme of Contract No. CV/2009/02 - Handling of Surplus Public Fill

Site Location : Tseung Kwan O Area 137 Fill Bank

ID	Activity	Original Duration	Start	Finish
S101000	Taking Over the Existing Facilities	0	19/01/2010	
S102000	Operation	1096	19/01/2010	18/01/2013
S103000	Operation and Maintenance of Tipping Halls	1096	19/01/2010	18/01/2013
S104000	Provision and Operation of a Crushing Plant	1096	19/01/2010	18/01/2013
S105000	Handing Over the Facilities to the Employer	0		18/01/2013
A101000	Removal of Stockpile Area A3	100	19/01/2010	28/04/2010
A102000	Site Formation	7	22/04/2010	28/04/2010
A103000	Provision of New Combined Reception and Exit Offices	90	29/04/2010	27/07/2010
A104000	Provision of Inspection Platform	60	28/07/2010	25/09/2010
A105000	Provision of Measurement Systems	60	28/07/2010	25/09/2010
A106000	Provision of Surveillance Systems	60	28/07/2010	25/09/2010
A107000	Provision of Wheel Washing Facilities	60	28/07/2010	25/09/2010
A109000	Testing, Commissioning & Handover	21	14/09/2010	10/04/2010
A109100	Removal of Existing Combined Reception & Exit Offices & other Facilities A3	14	10/05/2010	18/10/2010
A109200	Removal of Existing Combined Reception & Exit Offices & other Facilities A6	14	10/05/2010	18/10/2010
A201000	Removal of Stockpile Area at Portion A6	316	19/01/2010	30/11/2010
A209100	Construction of Access Road at Portion A6	60	20/10/2010	18/12/2010
A209200	Construction of Access Road at Portion A3	61	19/10/2010	18/12/2010



## **Appendix I**

### **H**

#### **IEC's Site Audit Records**

**Project:** Contract No.: CV/2009/02  
 Handling of Surplus Public Fill

**Inspection**

**Date:** 7 November 2012

**Time:** 11:00

**Location:** TKO Area 137

**Checklist No.** CEDPFRSFEM00\_121107\_TKOFB

**Inspected by**

**CEDD:** CK WOO

**IEC:** JASON LAM

**ET:** KW MAK

**Contractor:** SW SUNG

**PART A: GENERAL INFORMATION**

**Weather:**  Sunny  Fine  Cloudy  Rainy

**Temperature:** 24 °C

**Humidity:**  High  Moderate  Low

**Wind:**  Strong  Breeze  Light  Calm

**PART B: SITE AUDIT**

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 1: Water Quality**

1.01	Is an effluent discharge license obtained for the Project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.02	Is the effluent discharged in accordance with the discharge licence?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.03	Is the discharge of turbid water avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.04	Are temporary intercepting drains provided at the stockpiling area to divert polluted stormwater to the intercepting channels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.05	Are all catchpits, sand and silt removal facilities, and the drainage and intercepting channels on site properly maintained?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.06	Is the stormwater intercepting system effective to collect of runoff and remove suspended solids before discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.07	Is water retained in receptacles and standing water avoided to prevent mosquito breeding?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.08	Is the material properly covered to prevent washed away especially before rainstorm?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.09	Is the temporary slope surface covered with impemeable sheet or sprayed with water or protected by other method approved by CEDD when rainstorm is imminent or forecast?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10	Is the final slope surface treated by compaction, followed by hydroseeding or other suitable surface stabiliser approved by CEDD to prevent washing away of stockpiled material?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.11	Is a wheel washing bay with high pressure water jets provided at the site exit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	Is sand and silt settled out or removed before being discharged into storm drains?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.13	Are the manholes covered and sealed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.14	Is sewage from toilets discharged in to a foul sewer, or chemical toilets provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.15	Is sewage from chemical toilets collected by a licensed contractor for disposal and maintenance of these facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.16	Are tipping halls enclosed with top and 3-sides to prevent spillage of material into marine water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.17	Is silt curtain provided at the outward side at the TKO basin near the barging point?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.18	Is a waste collection vessel deployed to remove floating debris?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.19	Is foam, oil, grease, scum, litter or other objectionable matters avoided on the water in vicinity of the barging facilities during the work activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.20	Are the barges in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller washing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
1.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.25	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Section 2: Air Quality</b>						
2.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.11	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.12	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.14	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
2.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 3: Noise</b>						
3.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 4: Waste/Chemical Management</b>						
4.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.04	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.12	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
4.14	Are the chemical wastes separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.15	Are chemical wastes including waste oil stored properly in designated areas, e.g. chemical waste storage area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.16	Is the designated chemical waste storage area used for storing chemical wastes only?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.17	Is chemical waste storage area suitable for the substance they are holding, resistant to corrosion, maintained in good condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.18	Is chemical waste storage area enclosed on at least 3 sides and securely closed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.19	Is chemical waste storage area provided with bunds of a capacity to contain 110% of the total volume of container?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.20	Is chemical waste storage area well ventilated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.21	Is chemical wastes storage area covered to prevent rainfall entering?(water collected within the bund must be tested and disposal as chemical waste if necessary)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.22	Is chemical waste storage area arranged so that incompatible materials are adequately separated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.23	Are warning panels displayed at the waste storage area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.24	Is the waste storage area cleaned and maintained regularly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.25	Is chemical waste transported by a registered chemical waster collector to a facility licensed to receive chemical waste?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.26	Are all generators, fuel and oil storage located within bundle areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27	Is oil leakage from machinery, vehicle and plant prevented?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.28	Are procedures as outlined in the Spillage Response Plan followed in the event of chemical waste/dangerous goods/ chemical spillage or leakage?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.29	Are the dangerous goods/chemical spillage or leakage procedures in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.30	Is approved personnel nominated? For example, 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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.31	Is there any training of site personnel in proper waste management and chemical handling procedures provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.32	Is good site practices adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.33	Is there any recording system for the amount of wastes generated, recycled and disposed? For example, trip ticket system for chemical waste disposal. Quantities could be determined by weighting each load or other suitable methods.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 5: Landscape &amp; Visual</b>							
5.01	Is the maximum stockpiling height at the fill bank limited to a maximum of +35.2mPD?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.02	Is the landscape and visual mitigation measures in accordance with the landscape plan implemented during the operational and removal phases?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.03	Is the surface of outer slopes of the Fill Bank preferably hydroseeded or covered with geo-textile matting of appropriate colour (e.g dark green/brown) once completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.04	Is the design of the fill bank and plant form heights adopted allowed the fill bank to fit into the general topography of the surrounding land (straight edged slopes should be avoided)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.05	Is the operation of barging point not allowed from 7:00 p.m. to 8:00 a.m. daily to avoid potential visual impact from glare?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 6: Others**

6.01 Is the fill bank site restricted access by the general public?

6.02 Is environmental permit displaced conspicuously on site?

**Section 7: Follow-up for the Previous Environmental Inspection on date** 25.10.12 (Ref No. CEDPFRSFEM00\_121025\_TKOFB)

Is the situation in item Fu ① improved / rectified?

closed; pz

Is the situation in item \_\_\_\_\_ improved / rectified?

Is the situation in item \_\_\_\_\_ improved / rectified?

Is the situation in item \_\_\_\_\_ improved / rectified?

Is the situation in item \_\_\_\_\_ improved / rectified?

**Remarks:**

Follow up:

- The deposited silt inside Catchpit NO.8 had been cleared. (closed)

During this inspection:

- NO adverse environmental observation is recorded.

Signature: CEDD's Representative	Signature: IEC Auditor	Signature: ET Auditor	Signature: Contractor's Representative
Name: <u>C. K. Wong</u>	Name: <u>K CUM</u>	Name: <u>Mak Hei Wai</u>	Name: <u>Sam Suen</u>
Date: <u>7-11-2012</u>	Date: <u>7.11.2012</u>	Date: <u>7/11/12</u>	Date: <u>7/11/12</u>

**Contract No.: CV/2009/02**

**Inspection Date: 7 November 2012**

**(1) Follow up the previous inspection**

**Checklist No.: CEDPFRSFEM00\_121025\_TKOFB**

**Before**



Photo 1

Catchpit No.8

Deposition of silt and silty water are found at Catchpit No.8 at CREO.

The Contractor is reminded to frequently clean and maintain the catchpit.

**After**



Photo 2

Catchpit No.8

The deposited silt inside catchpit had been cleared. **(Closed)**

**(2) Observation during site inspection**

**Checklist No.: CEDPFRSFEM00\_121107\_TKOFB**

**No adverse environmental observation was recorded.**

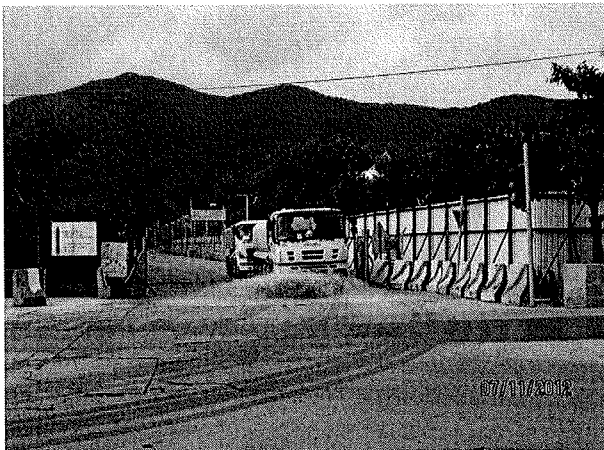


Photo 3

Site haul road was frequently watered to suppress dust generation.



Photo 4

Drip tray and tarpaulin sheet was provided to prevent oil leakage.

Project: Contract No.: CV/2009/02  
 Handling of Surplus Public Fill

Inspection Date: 23 November 2012  
 Time: 15:00  
 Location: TKO Area 137

Checklist No. CEDPFRSFEM00\_121123\_TKOFB

Inspected by: CY WONG, CK WOO

CEDD: JASON LAI

ET: KW MAK

Contractor: SW SUNG

**PART A: GENERAL INFORMATION**

Weather:  Sunny  Fine  Cloudy  Rainy

Temperature: 22 °C

Humidity:  High  Moderate  Low

Wind:  Strong  Breeze  Light  Calm

**PART B: SITE AUDIT**

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 1: Water Quality**

1.01	Is an effluent discharge license obtained for the Project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.02	Is the effluent discharged in accordance with the discharge licence?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.03	Is the discharge of turbid water avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.04	Are temporary intercepting drains provided at the stockpiling area to divert polluted stormwater to the intercepting channels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.05	Are all catchpits, sand and silt removal facilities, and the drainage and intercepting channels on site properly maintained?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.06	Is the stormwater intercepting system effective to collect of runoff and remove suspended solids before discharge?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.07	Is water retained in receptacles and standing water avoided to prevent mosquito breeding?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.08	Is the material properly covered to prevent washed away especially before rainstorm?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.09	Is the temporary slope surface covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD when rainstorm is imminent or forecast?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10	Is the final slope surface treated by compaction, followed by hydroseeding or other suitable surface stabiliser approved by CEDD to prevent washing away of stockpiled material?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.11	Is a wheel washing bay with high pressure water jets provided at the site exit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	Is sand and silt settled out or removed before being discharged into storm drains?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.13	Are the manholes covered and sealed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.14	Is sewage from toilets discharged in to a foul sewer, or chemical toilets provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.15	Is sewage from chemical toilets collected by a licensed contractor for disposal and maintenance of these facilities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.16	Are tipping halls enclosed with top and 3-sides to prevent spillage of material into marine water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.17	Is silt curtain provided at the outward side at the TKO basin near the barging point?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.18	Is a waste collection vessel deployed to remove floating debris?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.19	Is foam, oil, grease, scum, litter or other objectionable matters avoided on the water in vicinity of the barging facilities during the work activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.20	Are the barges in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller washing?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
1.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.25	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Section 2: Air Quality</b>						
2.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.03	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.06	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.07	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.08	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.09	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.10	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.11	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.12	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.14	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
2.21	Is a buffer zone of at least 100m provided between the edge of the stockpiling area and the TVB Broadcast and production Centre in the TKO Industrial Estate?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.22	Is site fencing of 2.4m high erected along the entire northern boundary of the site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 3: Noise</b>							
3.01	Are the approved method of working, equipment and sound reducing measures adopted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.02	Are the site activities scheduled to minimize noise nuisance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.03	Are all plants well maintained and in good condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.04	Are the Powered mechanical plant (PME) covered or shielded by appropriate acoustic materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.05	Are air compressors and hand held breakers fitted with valid noise emission labels during operation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.06	Are the compressors and generators operated with door closed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.07	Are idle machines and plants shut down or throttled down?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.08	Are noisy equipment and mobile plant sited away from NSRs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.09	Are the works within 10m from the western boundary of the Clearwater Bay Country Park not allowed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.10	Is the operation hours of the fill bank restricted to 8:00 a.m. to 11:00 p.m.?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 4: Waste/Chemical Management</b>							
4.01	Are recycle bins for paper, plastic bottles and aluminium cans provided at the site office area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.02	Are the recyclable wastes reused on site or collected by the licensed waste recycling agents?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.03	Is relevant license/permit for disposal of construction waste or excavated material, if generated from the site, available for inspection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.04	Is excavated material, if generated from the site, reused on-site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.05	Is mud and debris removed from waterworks access roads and associated drainage systems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.06	Is sufficient waste disposal points and regular collection for disposal provided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.07	Are appropriate measures employed to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.08	Is there any 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.09	Is the disposal of C&D waste, recyclable materials salvaged for reuse and inert waste utilised as public fill to minimize the quality of waste to be disposed of to landfill?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.10	Is trip ticket system implemented for the disposal of construction wastes, in order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.11	Is soil contaminated with chemicals/oils removed from site and the void created shall be filled with suitable materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.12	Is the Contractor registered as a chemical waste producer? The waste Disposal Ordinance (Cap354) and its subsidiary regulations in particular the waste disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.13	Are chemical wastes handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical wastes after use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
4.14	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.15	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.19	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.21	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.22	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.23	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.24	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.25	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.26	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.29	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.31	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.32	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.33	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Section 5: Landscape &amp; Visual</b>						
5.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.02	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.05	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Not Obs.	Yes	No	Follow up	N/A	Photo/Remarks
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**Section 6: Others**

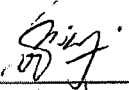


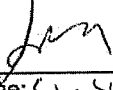
6.01	Is the fill bank site restricted access by the general public?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.02	Is environmental permit displaced conspicuously on site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Section 7: Follow-up for the Previous Environmental Inspection on date** 07.11.2012 (Ref No. CEDPFRSFEM00\_121107\_TKOFB)

Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>NO Follow up</u>
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the situation in item _____ improved / rectified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Remarks:**

*During this inspection:*  
 - NO adverse environmental observation is recorded.

Signature: CEDD's Representative	Signature: IEC Auditor	Signature: ET Auditor	Signature: Contractor's Representative
			
Name: <u>C. K. Wood</u>	Name: <u>KC LAI</u>	Name: <u>Mark Kei Wai</u>	Name: <u>S. W. Shum</u>
Date: <u>23.11.2012</u>	Date: <u>23.11.2012</u>	Date: <u>23/11/12</u>	Date: <u>23/11/12</u>



**Contract No.: CV/2009/02**

**Inspection Date: 23 November 2012**

**Observation during site inspection**

**Checklist No.: CEDPFRSFEM00\_121123\_TKOFB**



Photo 1 and 2

No adverse environmental observation was recorded.


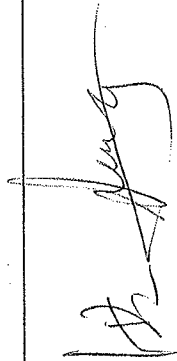

## Appendix I

### I

## Weekly ET's Site Inspection Record

CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 7/11/12  
 Time : 11:00  
 Weather : Sunny / Fine Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 24°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C. K. Joo	Hi <sup>Hi sum</sup> Contractor	Mark Jee Wan
Title	Area/B	S.S. AGO	E.T

Environmental Checklist		Implementation Stages*			Remark
		Yes	No	N/A	
<b>Fugitive Dust Emission</b>					
	▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	√			
	▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	√			
	▪ Water sprays shall be provided and used to dampen materials.	√			
	▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	√			
	▪ All vehicles shall be restricted to a maximum speed of 10 km per hour.	√			
	▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	√			
	▪ The designated site main haul road shall be paved or regular watering.	√			
	▪ Frequent watering of work site shall be at least three times per day.	√			
	▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	√			
	▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	√			
	▪ All plant and equipment should be well maintained e.g. without black smoke emission.	√			
	▪ Open burning should be prohibited.	√			
	▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√			
	▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
	▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	√			
	▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	√			
	▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	√			
<b>Noise Impact</b>					
	▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	√			
	▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	√			
	▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	√			
	▪ Air compressors and hand held breakers should have noise labels.	√			
	▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	√			
	▪ Noisy equipment and mobile plant shall always be site away from NSRs.	√			

CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tseung Kwan O Fill Bank

	Implementation Stages*		Remark
	Yes	No	
	N/A		
<b>Water Quality</b>			
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√		
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	√		
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	√		
Manholes should be covered and sealed.	√		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√		
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	√		
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	√		
The stormwater intercepting system shall be effective to collect runoff and remove suspended solids before discharge.	√		
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√		
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√		
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	√		
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	√		
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	√		
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	√		
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	√		
Oil interceptor shall be provided at work shop.	√		
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	√		
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	√		
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	√		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√		
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	√		
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	√		
Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	√		
A waste collection vessel shall be deployed to remove floating debris.	√		


Environmental Checklist	Implementation Stages*		Remark
	Yes	No / N/A	
<b>Landscape and Visual</b>			
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p></p> <p></p>
<b>Other Environmental Factors</b>			
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> <li>All generators, fuel and oil storage are within bundle areas.</li> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> <li>The Environmental Permit should be displaced conspicuously on site.</li> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p>

**Summary of the Weekly Site Inspection:**

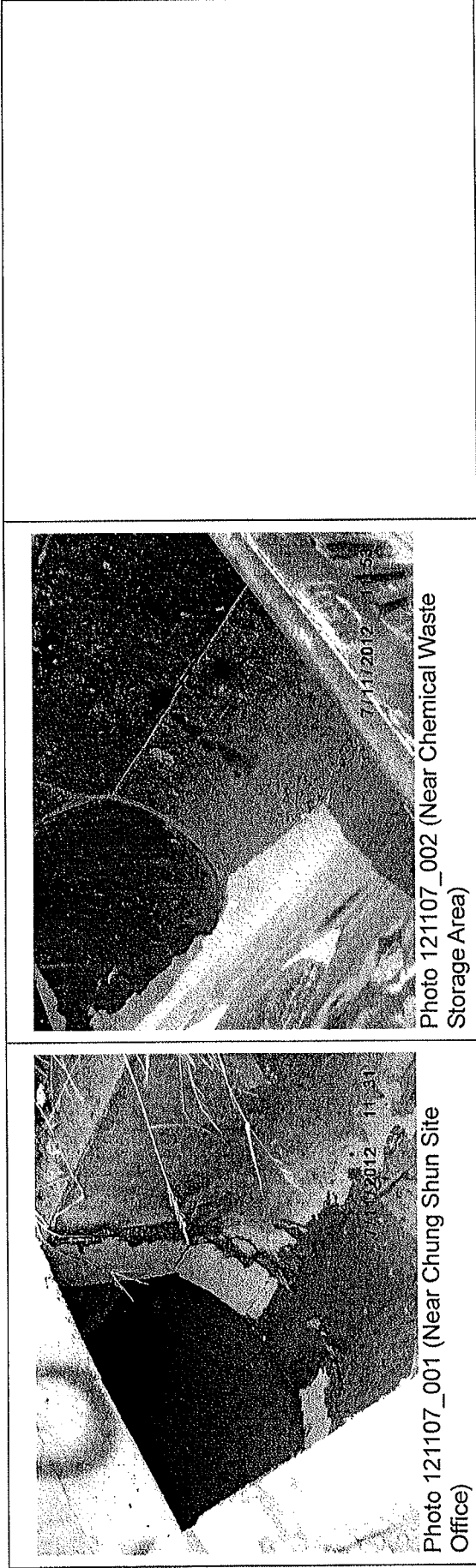
Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 1 on 25/10/12 and item 1 on 31/10/12, mud and silt accumulated inside the drainage channel near Chung Shun Site Office were cleared.	---	121107_001	No	---
2	Follow up action to item 2 on 31/10/12, standing water and rubbish inside the bucket of a repairing excavator near chemical waste storage area were cleared.	---	121107_002	No	---

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		07 November 2012

Photos





CEDD Contract No.: CV/2009/02  
Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 14/11/12


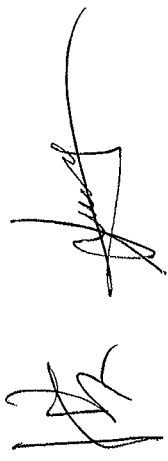
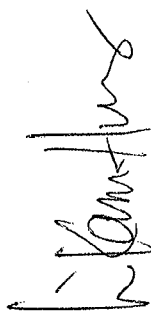
Time : 10:30

Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy

Wind : Calm / Light / Breeze / Strong

Temperature : 25°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Mak
Name:	C.K. Woo	 S.S. Ago	Mak Jai Wan
Title	Acas/PB	S.S. Ago	E.T




Environmental Checklist	Implementation Stages*		Remark
	Yes	No / N/A	
<b>Water Quality</b>			
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	✓		
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	✓		
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	✓		
Manholes should be covered and sealed.	✓		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	✓		
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	✓		
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafloor.	✓		
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	✓		
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓		
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓		
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓		
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓		
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcore to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	✓		
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	✓		
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	✓		
Oil interceptor shall be provided at work shop.	✓		
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	✓		
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	✓		
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	✓		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	✓		
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	✓		
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	✓		
Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	✓		
A waste collection vessel shall be deployed to remove floating debris.	✓		

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
▪ The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.	√			
▪ The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.	√			
▪ Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.	√			
▪ The barging point and the C&DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.	√			
<b>Other Environmental Factors</b>				
▪ C&D waste sorted from mixed C&D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.	√			
▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
▪ Any unused materials or those with remaining functional capacity should be recycled and stored properly.	√			
▪ All generators, fuel and oil storage are within bundle areas.	√			
▪ Oil leakage from machinery, vehicle and plant is prevented.	√			
▪ The Environmental Permit should be displaced conspicuously on site.	√			
▪ Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.		√		Item 2
▪ To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.	√			

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	The skirt curtain of a generator at dry soils deposition area was broken.	To replace the skirt curtain immediately.	121114_001	Yes	21/11/12
2	C&D wastes such as steel and boxes were found discarded at Section A6 – Tyre Workshop.	To collect and disposed of the waste properly.	121114_002 & 121114_003	Yes	21/11/12

Remark

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		14 November 2012

Photos

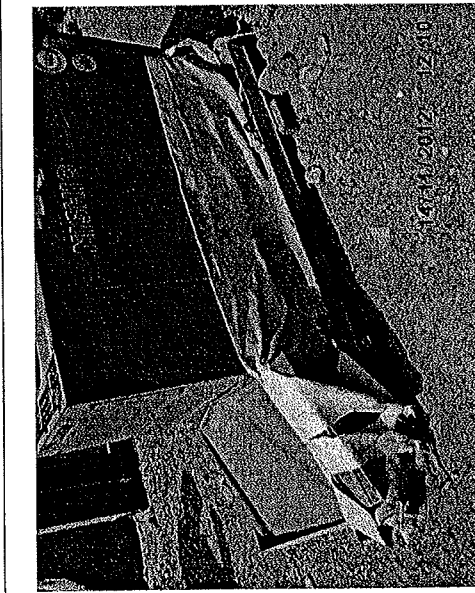


Photo 121114\_001 (Dry Soils Deposition Area)

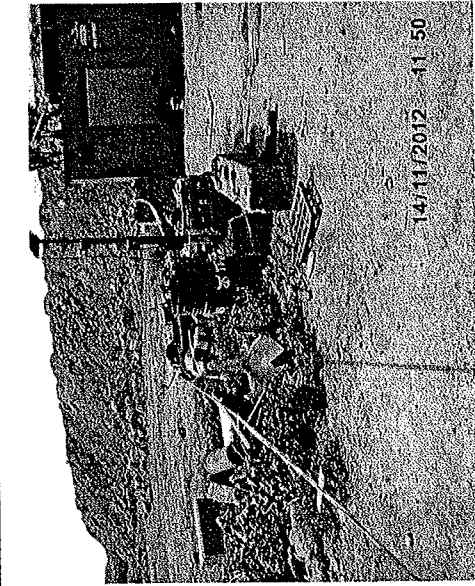


Photo 121114\_002 (Section A6 - Tyre Workshop)

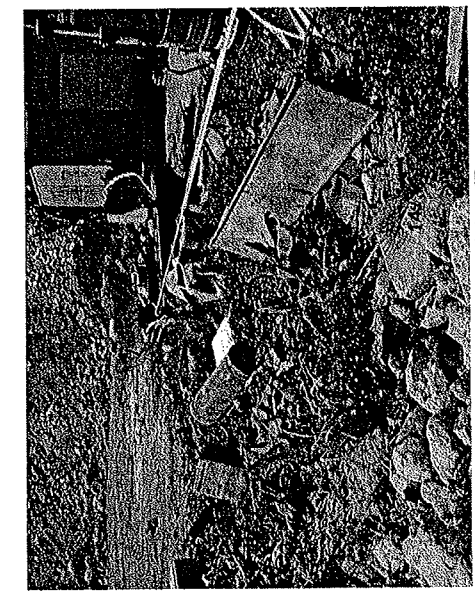

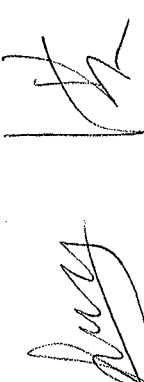



Photo 121114\_003 (Section A6 - Tyre Workshop)

CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 23/11/12  
 Time : 15:00  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 22°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C. K. Wong	S. W. Sun W. Kam Hung	Mark Hei Wan
Title	A10w/p3	REC S.S.	E.T

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	✓			
▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	✓			
▪ Water sprays shall be provided and used to dampen materials.	✓			
▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	✓			
▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.	✓			
▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have property fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	✓			
▪ The designated site main haul road shall be paved or regular watering.	✓			
▪ Frequent watering of work site shall be at least three times per day.	✓			
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	✓			
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	✓			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
▪ Open burning should be prohibited.	✓			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓			
▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	✓			
▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	✓			
▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	✓			
<b>Noise Impact</b>				
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓			
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	✓			
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	✓			
▪ Air compressors and hand held breakers should have noise labels.	✓			
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓			
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	✓			



Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Water Quality</b>				
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	√			
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	√			
Manholes should be covered and sealed.	√			
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√			
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	√			
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafont.	√			
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√			
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	√			
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	√			
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	√			
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	√			
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	√			
Oil interceptor shall be provided at work shop.	√			
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	√			
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	√			
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	√			
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	√			
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	√			
Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	√			
A waste collection vessel shall be deployed to remove floating debris.	√			

### Environmental Checklist

Implementation Stages*	Remark	
	Yes	No
		N/A
<b>Landscaping and Visual</b>		
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	
<b>Other Environmental Factors</b>		
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> <li>All generators, fuel and oil storage are within bundle areas.</li> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> <li>The Environmental Permit should be displaced conspicuously on site.</li> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	<ul style="list-style-type: none"> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> <li>✓</li> </ul>	

**Summary of the Weekly Site Inspection:**

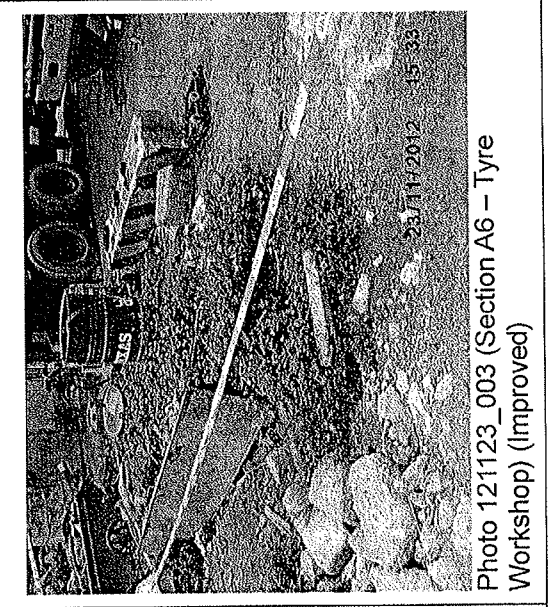
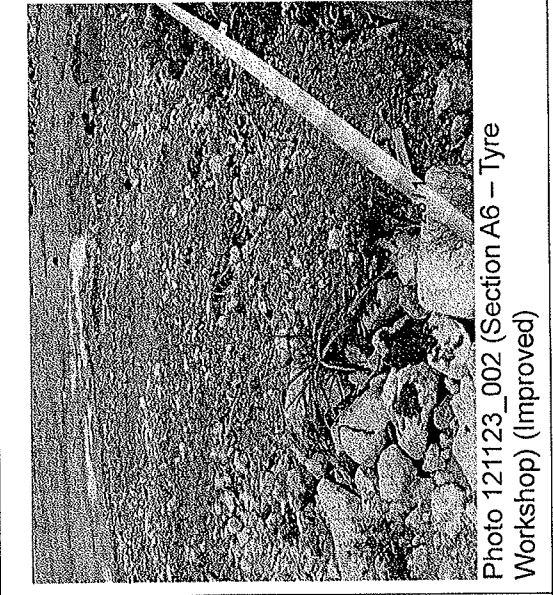
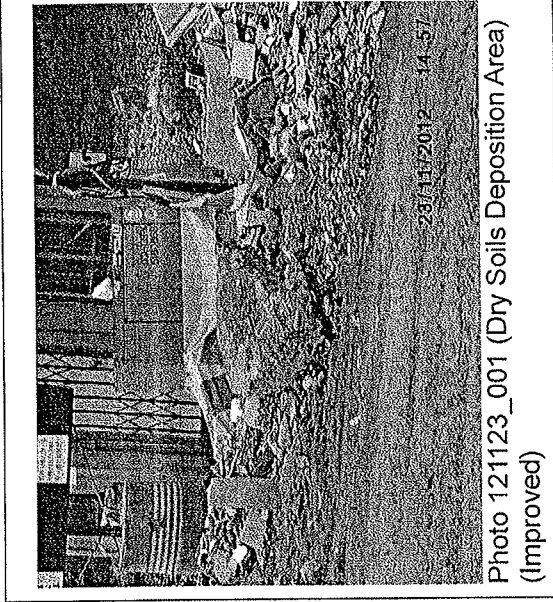
Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
1	Follow up action to item 1 on 14/11/12, the skirt curtain of a generator at dry soils deposition area was replaced.	---	121123_001	No	---
2	Follow up action to item 2 on 14/11/12, C&D wastes such as steel and boxes discarded at Section A6 - Tyre Workshop were collected.	---	121123_002 & 121123_003	No	---

Remark

--


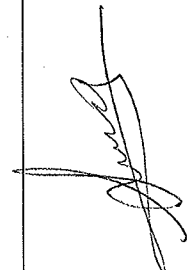

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer	<i>Linda Law</i>	23 November 2012

**Photos**



CEDD Contract No.: CV/2009/02  
 Handling of Surplus Public Fill - Tseung Kwun O Fill Bank

Inspection Date : 28/11/12  
 Time : 10:45  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 20°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C. H. Woo	S.W. Sun	Mark Hei
Title	AWOP3	S.S.	E.T

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	√			
▪ A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed.	√			
▪ Water sprays shall be provided and used to dampen materials.	√			
▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.	√			
▪ All vehicles shall be restrict to a maximum speed of 10 km per hour.	√			
▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	√			
▪ The designated site main haul road shall be paved or regular watering.	√			
▪ Frequent watering of work site shall be at least three times per day.	√			
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	√			
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	√			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	√			
▪ Open burning should be prohibited.	√			
▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	√			
▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shot concrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.	√			
▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.	√			
▪ The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m.	√			
<b>Noise Impact</b>				
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	√			
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	√			
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	√			
▪ Air compressors and hand held breakers should have noise labels.	√			
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	√			
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	√			

Environmental Checklist	Implementation Stages*		Remark
	Yes	No / N/A	
<b>Water Quality</b>			
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	✓		
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	✓		
Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels.	✓		
Manholes should be covered and sealed.	✓		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	✓		
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	✓		
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	✓		
The stormwater intercepting system shall be effective to collect runoff and remove suspended solids before discharge.	✓		
The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD.	✓		
Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	✓		
Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	✓		
A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	✓		
The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcore to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	✓		
Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	✓		
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas.	✓		
Oil interceptor shall be provided at work shop.	✓		
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	✓		
The barges shall be in right size such that adequate clearance is maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash.	✓		
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	✓		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	✓		
Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal.	✓		
The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities.	✓		
Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse.	✓		
A waste collection vessel shall be deployed to remove floating debris.	✓		

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Landscape and Visual</b>				
<ul style="list-style-type: none"> <li>The design of the fill bank and platform heights adopted should allow the fill bank to fit into the general topography of the surrounding land. Straight edged slopes should be avoided.</li> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> <li>Surface of outer slopes of the fill bank shall preferably be hydroseeded or covered with geo-textile matting of appropriate colour (e.g. dark green / brown) once completed.</li> <li>The barging point and the C&amp;DMSF at the fill bank shall not be in operation from 07:00 pm to 08:00 am daily to avoid potential visual impact from glare.</li> </ul>	√			
<b>Other Environmental Factors</b>				
<ul style="list-style-type: none"> <li>C&amp;D waste sorted from mixed C&amp;D material shall be removed from the temporary buffer storage area on a daily basis and transfer to SENT landfill for disposal.</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> <li>Any unused materials or those with remaining functional capacity should be recycled and stored properly.</li> <li>All generators, fuel and oil storage are within bundle areas.</li> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> <li>The Environmental Permit should be displaced conspicuously on site.</li> <li>Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.</li> <li>To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.</li> </ul>	√			



**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Target Completion Date
---	---	---	---	---	---

Remark  
-----

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer	<i>Linda Law</i>	28 November 2012

## **Appendix I**

### **J**

## **Implementation Schedule of Mitigation Measures**







## **Appendix I**

### **K**

#### **Site General Layout plan**

- NOTES
1. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN METERS.
  2. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE SPECIFIED.
  3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE SPECIFIED.
  4. EXISTING MARKINGS SHALL BE MAINTAINED AND CLEARANCE SHALL BE MAINTAINED AT ALL TIMES.
  5. EXISTING MARKINGS SHALL BE MAINTAINED AND CLEARANCE SHALL BE MAINTAINED AT ALL TIMES.
  6. ALL EXISTING STRUCTURES SHALL BE DEMOLISHED AND REPLACED WITH NEW STRUCTURES.
  7. ALL EXISTING UTILITIES SHALL BE MAINTAINED AND CLEARANCE SHALL BE MAINTAINED AT ALL TIMES.
  8. ALL EXISTING UTILITIES SHALL BE MAINTAINED AND CLEARANCE SHALL BE MAINTAINED AT ALL TIMES.

LEGEND

	SITE BOUNDARY
	NAME BOUNDARY AREA
	EXISTING CONSTRUCTION LEVEL
	10% SLOPE
	EXISTING CONCRETE ROAD
	EXISTING RETAINING WALL

REVISION	NO.	DATE	BY	CHECKED
1	1	2008/05/15	[Signature]	[Signature]
2	2	2008/06/10	[Signature]	[Signature]
3	3	2008/07/05	[Signature]	[Signature]
4	4	2008/08/01	[Signature]	[Signature]
5	5	2008/09/01	[Signature]	[Signature]
6	6	2008/10/01	[Signature]	[Signature]
7	7	2008/11/01	[Signature]	[Signature]
8	8	2008/12/01	[Signature]	[Signature]

DESIGNED BY: [Signature]  
 CHECKED BY: [Signature]  
 SCALE: AS SHOWN

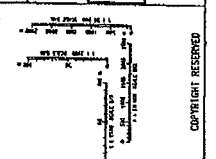
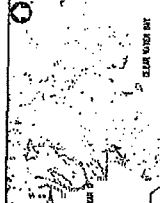
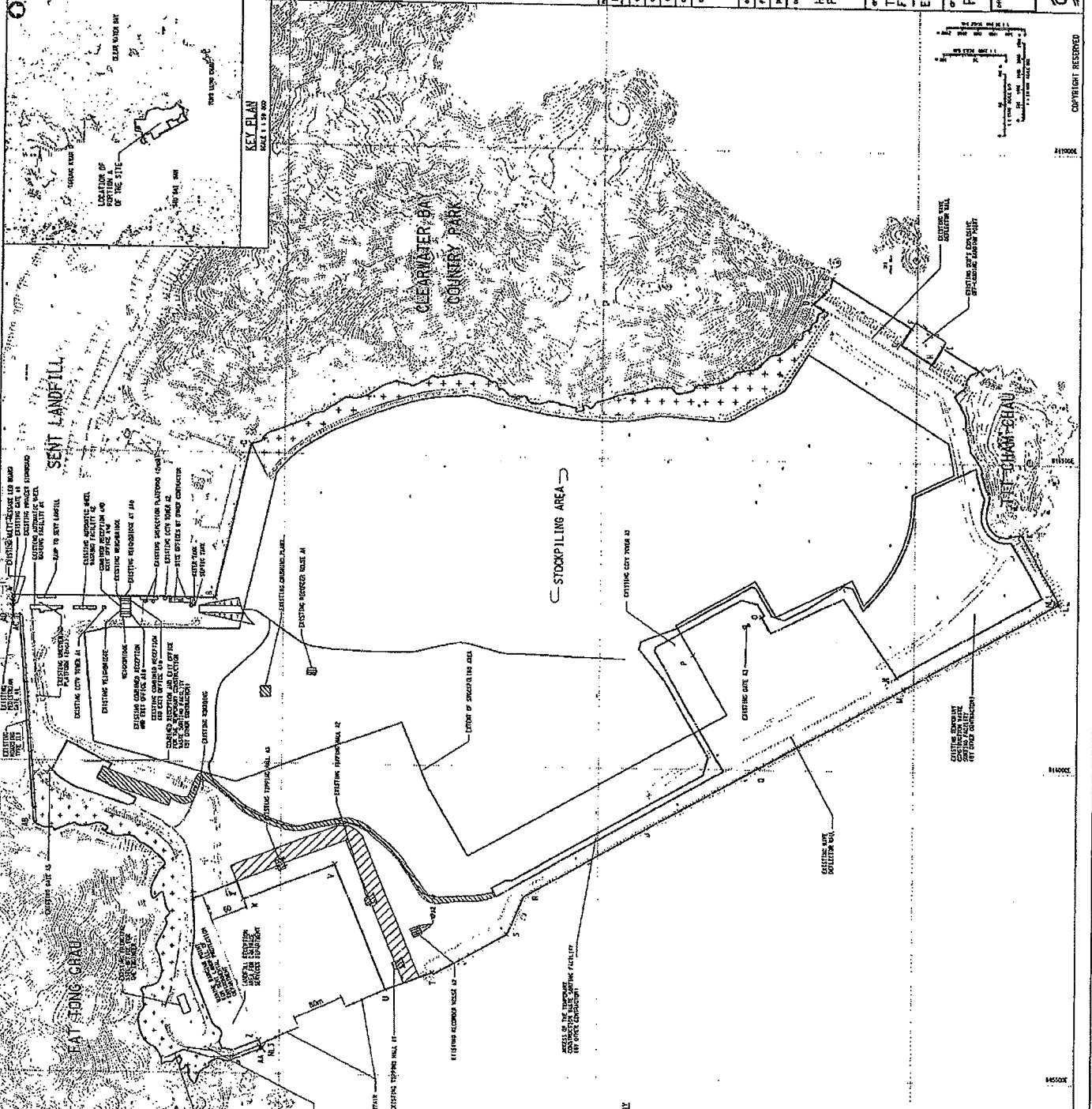
HANDLING OF SURPLUS  
PUBLIC FILL

PROJECT NO. FM10056-6

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

1:1 SCALE  
DATE: 2008/11/01

FILL MANAGEMENT ANALYSIS  
CIVIL ENGINEERING OFFICE



BOUNDARY DETAILS OF SITE BOUNDARY

POINTS	COORDINATES
A	117500.00, 117500.00
B	117500.00, 117500.00
C	117500.00, 117500.00
D	117500.00, 117500.00
E	117500.00, 117500.00
F	117500.00, 117500.00
G	117500.00, 117500.00
H	117500.00, 117500.00
I	117500.00, 117500.00
J	117500.00, 117500.00
K	117500.00, 117500.00
L	117500.00, 117500.00
M	117500.00, 117500.00
N	117500.00, 117500.00
O	117500.00, 117500.00
P	117500.00, 117500.00
Q	117500.00, 117500.00
R	117500.00, 117500.00
S	117500.00, 117500.00
T	117500.00, 117500.00
U	117500.00, 117500.00
V	117500.00, 117500.00
W	117500.00, 117500.00
X	117500.00, 117500.00
Y	117500.00, 117500.00
Z	117500.00, 117500.00

SCALE: 1:1000

DATE: 2008/11/01

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## **Appendix I**

**L**

### **Monitoring Schedule for the Coming Month**



## Contract No. CV/2009/02 Handling of Surplus Public Fill

### Tseung Kwan O Area137

Time Schedule for Impact Water Quality Monitoring (WQM), Impact Air Monitoring (1-hr TSP & 24-hr TSP), Weekly Site Inspection (Weekly SI) and Impact Noise Monitoring (NM)

**December 2012**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2 <u>24 hr TSP</u>	3 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (09:00 – 11:00) Mid-ebb (14:00 – 16:00)	4	5 <u>1-hr TSP</u> <u>Weekly SI</u> <u>NM</u> <u>WQM</u> Mid-flood (11:00-13:00) Mid-ebb (15:30-17:30)	6	7 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (12:00-14:00) Mid-ebb (17:15-19:15)	8 <u>24 hr TSP</u>
9	10 <u>1-hr TSP x 2</u> <u>WQM</u> Mid-ebb (08:30 – 10:30) Mid-flood (14:30 – 16:30)	11	12 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (10:30 -12:30) Mid-flood (15:30 -17:30)	13	14 <u>1-hr &amp; 24 hr TSP</u> <u>WQM</u> Mid-ebb (12:00 -14:00) Mid-flood (16:30 -18:30)	15
16	17 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (09:00-11:00) Mid-ebb (14:30-16:30)	18	19 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-flood (10:30-12:30) Mid-ebb (16:00-18:00)	20 <u>24 hr TSP</u>	21 <u>1-hr TSP x 2</u> <u>WQM</u> Mid-flood (12:00-14:00) Mid-ebb (18:00-20:00)	22
23	24 <u>1-hr TSP</u> <u>Weekly SI</u> <u>WQM</u> Mid-ebb (08:00-10:00) Mid -flood (14:00-16:00)	25	26 <u>24 hr TSP</u>	27	28 <u>1-hr TSP x 2</u> <u>WQM</u> Mid-ebb (11:00-13:00) Mid-flood (16:00-18:00)	29
30	31 <u>1-hr TSP</u> <u>WQM</u> Mid-flood (08:00-10:00) Mid -ebb (13:00-15:00)					





## **Appendix I**

### **M**

## **Complaint Log**

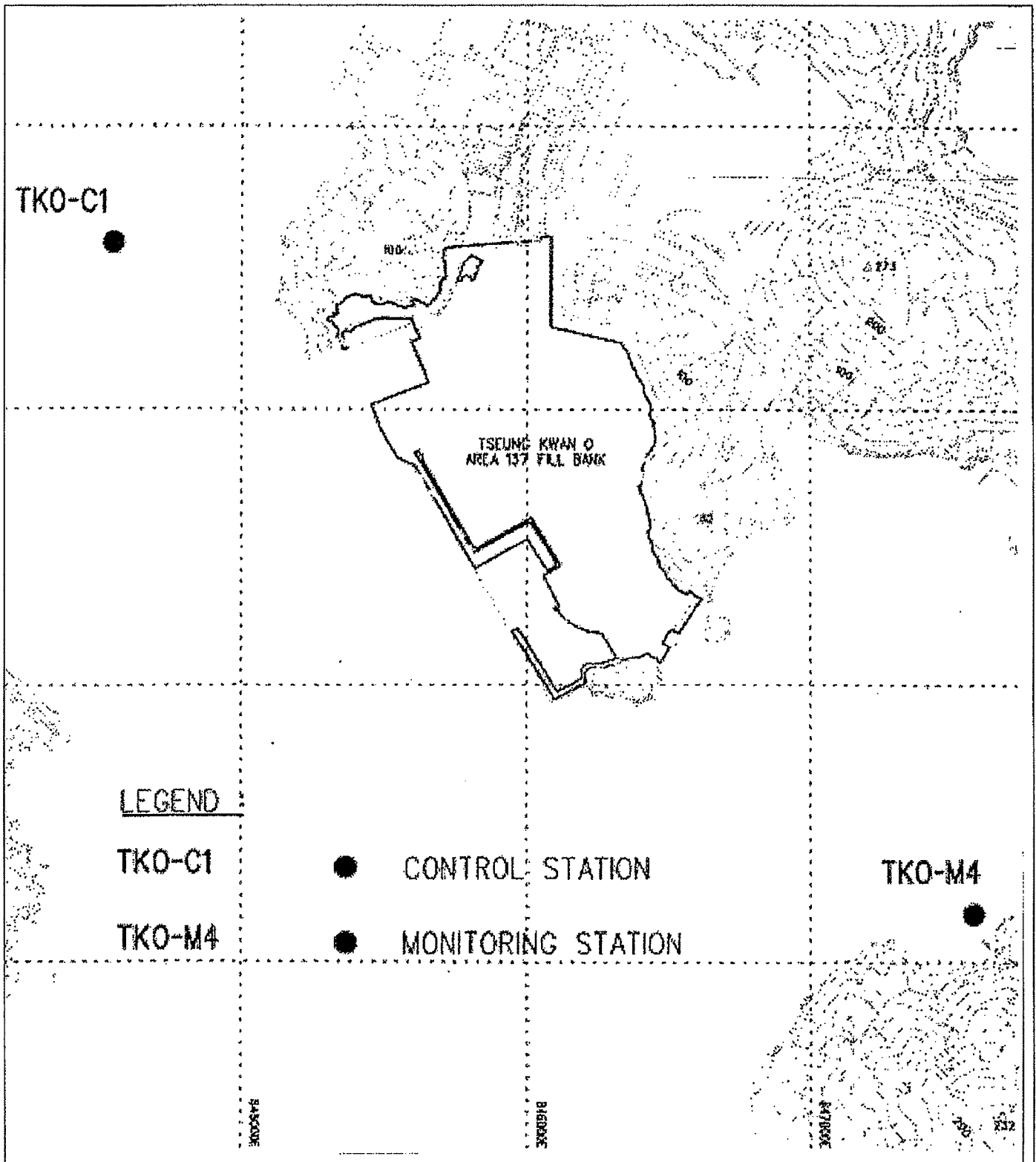
## Complaint Logs

Log Ref.	Location	Received Date	Details of Complaint	Investigation / Mitigation Action	Status
001	Working Area of the Fill Bank	25 August 2010	Three complaints received on 06 and 08 Aug 2010 was forwarded by the EPD on 25 August 2010 (Ref No.: (3) in EP3/N08/RE/00013438-10) from a citizen against dust emission at working area of the Fill Bank which caused by no water spray. The complainant complained that the dust generated caused an environmental nuisance.	<p>In response to the complaint, EPD had taken site investigations on 12 Aug 2010. During the site investigation, some improvements in the situation were noted by EPD and EPD reminded the Contractor to implement appropriate dust control measures as suggested in the EIA report to minimize dust impact to the environment, such as increasing the frequency of watering and spraying the site area especially during dry weather.</p> <p>Besides, a complaint Investigation report of this event have prepared by ET. From the investigation report, it noted that water spraying in the Fill Bank was not sufficient during the weekly site inspection on 07 Aug 2010 but there was no exceedance in air quality on 07 and 08 Aug 2010. Nevertheless, in view of our observation on site, the Contractor was still urged to increase the frequency of watering in the Project site especially during dry weather condition in order to enhance the air quality of the Project site. During the subsequently weekly site inspection on 14 Aug 2010, no more dust emission was observed in the Project site. It believed that the Contractor had provided as much as dust control measures to mitigate the problem and the air quality was further improved.</p>	Closed
002	Working Area of the Fill Bank	20 September 2011	Two complaints received on 24 and 29 August 2011 was forwarded by the EPD on 20 September 2011 (Ref No.: (2) in EP3/N08/RE/00017553-11) from public against dust emission at TKO137 Fill Bank. The complainant complained that the dust generated caused an environmental nuisance.	<p>Refer the EPD site investigation, no excessive emission of dust was revealed from the TKO137 Fill Bank. However, the Contractor was reminded to take more effort on the dust depression measures in the site area.</p> <p>Besides, a complaint Investigation report of this event have prepared by ET. From the investigation report, it noted that no fugitive dust emission was observed at TKO137 Fill Bank during the weekly site inspection on 24 and 31 August 2011 and no air quality exceedance was recorded during the dust monitoring period from 24 to 31 August 2011. Generally, the Contractor has implemented dust control measures to reduce dust impact to the environment but some improvement should be carried out. The Contractor should take more effort on the frequency of watering on site especially during dry weather.</p>	Closed



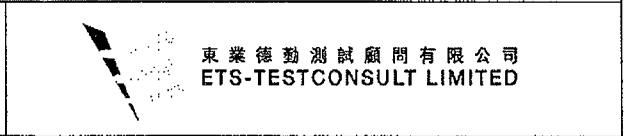
## Appendix I

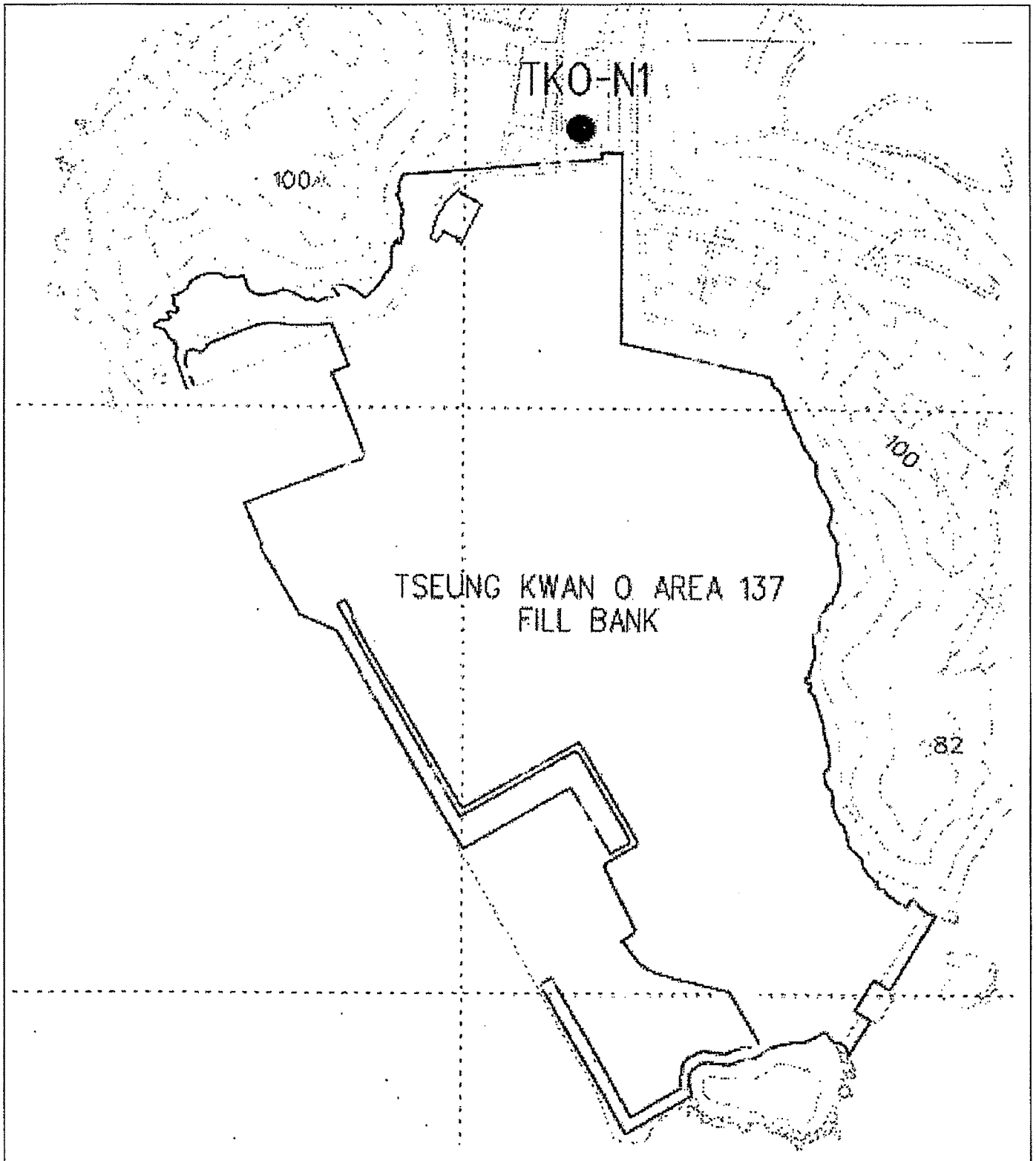
### Figures



Contract No. CV/2009/02  
 Handling of Surplus Public Fill

Figure 1  
 Locations of Water Quality Monitoring Stations –  
 Tseung Kwan O Area 137 Fill Bank





Contract No. CV/2009/02  
Handling of Surplus Public Fill

Figure 2  
Locations of Noise Monitoring Station –  
Tseung Kwan O Area 137 Fill Bank



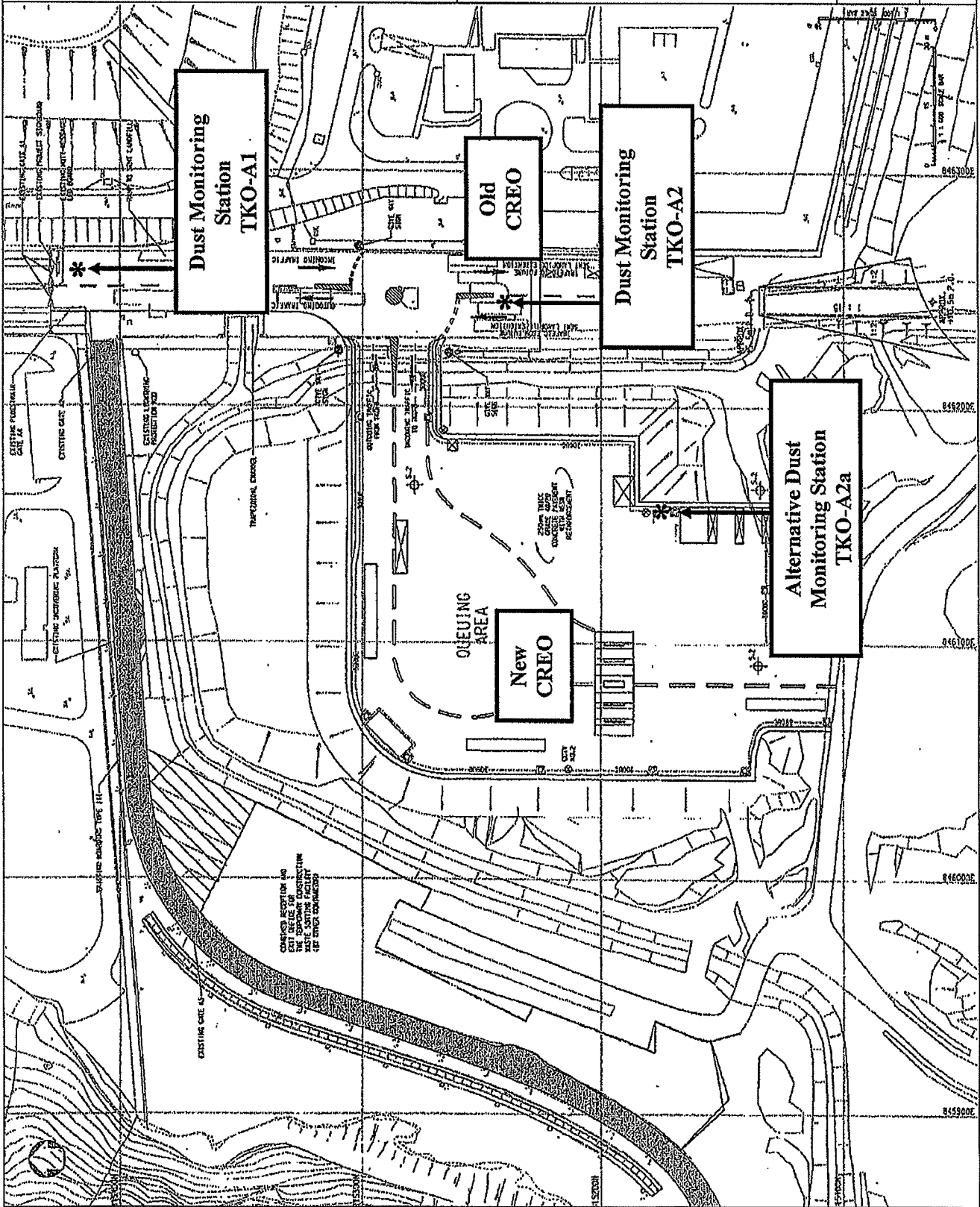
東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

Contract No.  
CV/2009/02  
Handling of  
Surplus Public  
Fill

Title:  
Locations of Air  
Quality  
Monitoring  
Stations -  
Tseung Kwan O  
Area 137 Fill  
Bank

ETS-Testconsult  
Ltd

Figure 3a





## **Appendix II**

**Marine Water Quality Monitoring Report for Contract No. HY/2010/02  
Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing  
Facilities – Reclamation Works**

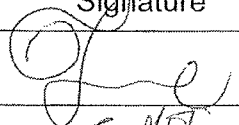

**China Harbour Engineering Company Limited**

Contract No. HY/2010/02

**Hong Kong – Zhuhai – Macao Bridge  
Hong Kong Boundary Crossing  
Facilities –  
Reclamation Works**

**Impact Water Quality Monitoring Report  
for TKO 137 Fill Bank**

[12/2012]

	Name	Signature
Prepared & Checked:	Isabella Yeung	
Reviewed & Approved:	Y T Tang	

Version:	Rev. 0	Date: 13 December 2012
<p><b>Disclaimer</b></p> <p>This report is prepared for China Harbour Engineering Company Limited and is given for its sole benefit in relation to and pursuant to Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Reclamation Works and may not be disclosed to, quoted to or relied upon by any person other than China Harbour Engineering Company Limited without our prior written consent. No person (other than China Harbour Engineering Company Limited) into whose possession a copy of this report comes may rely on this report without our express written consent and China Harbour Engineering Company Limited may not rely on it for any purpose other than as described above.</p>		

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## EXECUTIVE SUMMARY

On-site sorting facilities for imported material (public fill) for reclamation works of the “Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as “the Project”) were proposed to establish in Tseung Kwan O (TKO) 137 Fill Bank area (here below known as “the Works Area). Impact monitoring of water quality was conducted at the designated monitoring location. This report presents the impact monitoring results regarding water quality aspects performed in November 2012.

### *Water Quality*

Impact water quality monitoring was conducted at three monitoring stations, C1a, M4a & M5. Monitoring Station C1a serves as the control station; Monitoring Station M4a and M5 are the impact stations. The impact monitoring was carried out three times per week (from 1 to 30 November 2012) during the operation of the mentioned facilities for both mid-ebb and mid-flood tides. Data of temperature, salinity, dissolved oxygen (DO), turbidity (Tby) and suspended solids (SS) were collected and analysed. Details of the monitoring methodology, locations and results are presented in this report.

### **Breaches of Action and Limit Levels for Water Quality**

No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as “the Project”) mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCKL).
- 1.1.2 On-site sorting facilities for imported material (public fill) for reclamation works of the Project were proposed to establish in Tseung Kwan O (TKO) 137 Fill Bank area (here below, known as “the Works Area”). The proposed sorting facilities together with barging points, tipping halls and associated facilities will be installed at the Works Area.
- 1.1.3 The latest Environmental Permit (EP) for Fill Bank at TKO Area 137 was issued on 14 November 2011 (EP-134/2002/J) by the Environmental Protection Department (EPD) to CEDD, the Permit Holder, regarding the Project. Condition 3.2 of the EP requires the water quality monitoring frequency and parameters at stations C1a, M4a and M5 shall be same as the requirements set out in the EM&A Manual for TKO 137 Fill Bank (here below, known as “EM&A Manual”) and the monitoring results shall be incorporated in the monthly EM&A reports.

### **1.2 Purpose of the Report**

- 1.2.1 The purpose of this impact monitoring report is to assess environmental impact and compliance during transportation and operation of the mentioned facilities for the Project. This report presents the impact monitoring requirements, methodologies and results of water quality measurements in accordance with the EM&A Manual.
- 1.2.2 This impact report presents the monitoring works of water quality monitoring, at two monitoring stations (M4a and M5) and one control station (C1a), conducted in November 2012. A layout plan of the Works Area is provided in Figure 1.1.

### **1.3 Structure of the Report**

- 1.3.1 The structure of the report is as follows:

Section 1: Introduction, background, purpose and the structure of the report.  
Section 2: Water quality, which describes the impact water quality monitoring requirements, methodology and action/limit level.  
Section 3: Impact water quality monitoring results.  
Section 4: Conclusions.

## 2 WATER QUALITY

### 2.1 Monitoring Requirements

2.1.1 Impact marine water quality monitoring at 3 water quality monitoring stations should be established. In accordance with the EM&A Manual, impact water quality monitoring should be conducted 3 days per week during the operation of the facilities in the Works Area. Moreover, as stipulated in the latest EP, water quality monitoring should be conducted since 2 weeks before commencement of operation of the additional barging points. Measurements shall be taken at the 3 designated stations, 2 impact and 1 control station at mid-flood and mid-ebb tides at three water depths, i.e., 1 m below surface, mid-depth and 1 m from seabed.

### 2.2 Monitoring Equipment

2.2.1 Equipment used in the impact water quality monitoring programme is summarized in Table 2.1. A copy of the calibration certificates for the water quality monitoring equipment are attached in Appendix A.

**Table 2.1 Water Quality Monitoring Equipment**

Parameter	Model and Make
Coordinate of Monitoring stations	Garmin etrex 10
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI Pro2030
Turbidity	HACH Model 2100Q Turbid Meter
Water Depth	Speedtech Instrument SM-5A

### 2.3 Monitoring Parameters, Frequency and Duration

2.3.1 Table 2.2 summarises the monitoring parameters, frequency and duration of impact water quality monitoring. Impact water quality monitoring was carried out at three stations in November 2012. Detailed impact water quality monitoring schedule was provided in Appendix B.

**Table 2.2 Water Quality Monitoring Parameters, Frequency and Duration**

Monitoring Stations	Parameter, unit	Frequency	No. of Depths
<p><i>Control Stations:</i> C1a</p> <p><i>Impact Stations:</i> M4a – M5</p>	<ul style="list-style-type: none"> <li>• Depth, m</li> <li>• Temperature, °C</li> <li>• Salinity, ppt</li> <li>• DO, mg/L</li> <li>• DO Saturation, %</li> <li>• Turbidity, NTU</li> <li>• Suspended Solids (SS), mg/L</li> </ul>	<p>Three times per week during mid-ebb and mid-flood tides (within ± 1.75 hour of the predicted time)</p>	<p>3 (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted. Should the water depth be less than 3 m, only the mid-depth station will be monitored).</p>

### 2.4 Monitoring Locations

2.4.1 The measurements were taken at all designated impact and control stations summarized in Table 2.3. The two impact stations were chosen on the basis of their proximity to the Works Area, which would be under the greatest potential for water quality impacts. In addition, a control station was also set up for ebb-tide references respectively of the surrounding ambient.

**Table 2.3 Location of Water Quality Impact Stations**

Station I.D.	HK 1980 Grid		Status
	Easting	Northing	
C1a	845647	814146	Control Station (Ebb-tide)
M4a	845922	813973	Impact Station (Close to Additional Barging Point, Tipping Halls and Associated Facilities at TKO 137 Fill Bank)
M5	847005	813678	Impact Station (Close to Tai Miu Wan)

## 2.5 Monitoring Methodology

### 2.5.1 Instrumentation

- (a) The in-situ water quality parameters, viz. dissolved oxygen, temperature, salinity and turbidity were measured by multi-parameter meters and turbidity was measured by Turbid Meter.

### 2.5.2 Operating/Analytical Procedures

- (a) A hand-held digital Global Positioning Systems (GPS) were used to ensure that the correct location was selected prior to sample collection.
- (b) Portable, battery-operated echo sounders were used for the determination of water depth at each designated monitoring station.
- (c) All in-situ measurements were taken at 3 water depths, 1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth was less than 6 m, in which case the mid-depth station was omitted. Should the water depth be less than 3 m, only the mid-depth station was monitored.
- (d) At each measurement/sampling depth, two consecutive in-situ monitoring (DO concentration and saturation, temperature, turbidity, salinity) and water sample for SS were collected. For turbidity measurement, the sample was collected by using sampler and then transferred to the cell. The reading of turbidity of the sample was directly recorded from the Turbidimeter (HACH 2100Q) after inserting the cell to the Turbidimeter. For DO concentration and saturation, temperature and salinity, duplicate measurements were performed by dropping the calibrated probes of the corresponding monitoring equipments to the designated depths of the water column and taking readings after stabilized. Where the difference in the value between the first and second readings of DO or turbidity parameters was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- (e) Duplicate samples from each independent sampling event were collected for SS measurement. Water samples were collected using the water samplers and the samples were stored in high-density polythene bottles. Water samples collected were well-mixed in the water sampler prior to pre-rinsing and transferring to sample bottles. Sample bottles were pre-rinsed with the same water samples. The sample bottles were then be packed in cool-boxes (cooled at 4°C without being frozen), and delivered to Environmental Laboratory, ETS-Testconsult Ltd. (HOKLAS Registration No. 022) for the analysis of suspended solids concentrations. The laboratory determination work would be started within 24 hours after collection of the water samples. Environmental Laboratory, ETS-Testconsult Ltd., is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples was analyzed and attached in Appendix D.

### 2.5.3 Maintenance and Calibration

- (a) Before each round of monitoring, the dissolved oxygen probe of YSI Pro2030 was calibrated by the wet bulb method.
- (b) The monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS before use and subsequently re-calibrated at 3-monthly intervals throughout all stages of the water quality monitoring.

**2.6 Action and Limit Levels**

2.6.1 The Action and Limit Levels (AL levels) have been set in accordance with the derivation criteria specified in the EM&A Manual. This is shown in Table 2.4.

**Table 2.4 Action and Limit Levels for Water Quality**

Parameters	Action	Limit
DO in mg/L (Surface & Middle, Bottom)	Surface & Middle 5.5 mg/L  Bottom 5.2 mg/L	Surface & Middle 4.0 mg/L  Bottom 2.0 mg/L
SS in mg/L (depth-averaged)	4.9 mg/L or 120% of upstream control station's SS at the same tide of the same day	5.2 mg/L or 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids level at FCZ)
Turbidity in NTU (depth-averaged)	3.9 NTU or 120% of upstream control station's turbidity at the same tide of the same day	4.2 NTU or 130% of upstream control station's turbidity at the same tide of the same day

- Notes:
1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
  2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
  3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
  4. All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.

### 3 MONITORING RESULTS

3.1.1 The impact water quality monitoring results for C1a, M4a and M5 are summarized in Tables 2.5 and 2.6. Detail water quality monitoring results are presented in Appendix C.

**Table 2.5 Summary of Marine Water Monitoring Results for Mid-ebb Tide**

Monitoring Station	Temperature (°C)	Salinity (ppt)	DO (SM) (mg/L)	DO (Bottom) (mg/L)	DO Saturation (%)	Turbidity (NTU)	SS (mg/L)
C1a	24.4 (22.8 - 25.4)	27.0 (26.2 - 27.6)	6.0 (5.7 - 6.7)	5.9 (5.6 - 6.6)	84.0 (78.4 - 93.0)	3.7 (3.2 - 4.2)	4.7 (4.0 - 5.2)
M4a	24.4 (22.8 - 25.5)	27.0 (26.2 - 27.5)	6.1 (5.7 - 6.6)	5.9 (5.6 - 6.6)	83.9 (78.2 - 92.3)	3.6 (3.3 - 4.0)	4.6 (4.0 - 5.0)
M5	24.4 (22.9 - 25.5)	27.0 (26.2 - 27.5)	6.1 (5.7 - 6.7)	5.9 (5.7 - 6.7)	84.5 (79.3 - 93.4)	3.6 (3.3 - 4.0)	4.7 (4.2 - 5.2)

**Table 2.6 Summary of Marine Water Monitoring Results for Mid-flood Tide**

Monitoring Station	Temperature (°C)	Salinity (ppt)	DO (SM) (mg/L)	DO (Bottom) (mg/L)	DO Saturation (%)	Turbidity (NTU)	SS (mg/L)
C1a	24.4 (22.8 - 25.5)	27.0 (26.2 - 27.6)	6.1 (5.8 - 6.5)	5.9 (5.7 - 6.1)	84.2 (79.5 - 89.4)	3.6 (3.2 - 4.1)	4.6 (4.0 - 5.0)
M4a	24.4 (22.8 - 25.5)	27.0 (26.3 - 27.5)	6.1 (5.9 - 6.4)	5.9 (5.7 - 6.1)	84.5 (80.6 - 88.9)	3.6 (3.2 - 3.9)	4.5 (3.8 - 5.0)
M5	24.4 (22.9 - 25.5)	27.0 (26.2 - 27.5)	6.1 (5.8 - 6.4)	5.9 (5.6 - 6.2)	84.5 (78.4 - 89.4)	3.5 (3.2 - 3.9)	4.5 (4.0 - 5.2)

3.1.2 The weather conditions during the monitoring period were generally in cloudy or fine. Sea conditions for the majority of monitoring days are generally small wave. No major water pollution source, which might affect the result observed during the impact monitoring period.

3.1.3 Since the water depths at all the monitoring stations were generally higher than 6 m, sampling was conducted at three water depths at each station.



3.1.4 The summary of impact water quality exceedance is shown in Table 2.7.

**Table 2.7 Summary of Marine Water Monitoring Exceedance**

Monitoring Station	Exceedance Level	DO (SM)		DO(Bottom)		Turbidity		SS		Total	
		Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb
M4a	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
M5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0

Note: S: Surface; and  
 M: Mid-depth.

3.1.5 No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

## **4 CONCLUSIONS**

- 4.1.1 This impact monitoring report presents impact monitoring results for water quality at designated locations C1a, M4a and M5 in accordance with the EM&A Manual. Monitoring Station C1a serves as the control station; Monitoring Station M4a and M5 are the impact stations.
- 4.1.2 All laboratory results satisfied the QA/QC requirements and all monitoring equipment is properly calibrated and with valid calibration certificates.
- 4.1.3 No exceedance of Action and Limit Level of water quality monitoring results was recorded in the reporting month.

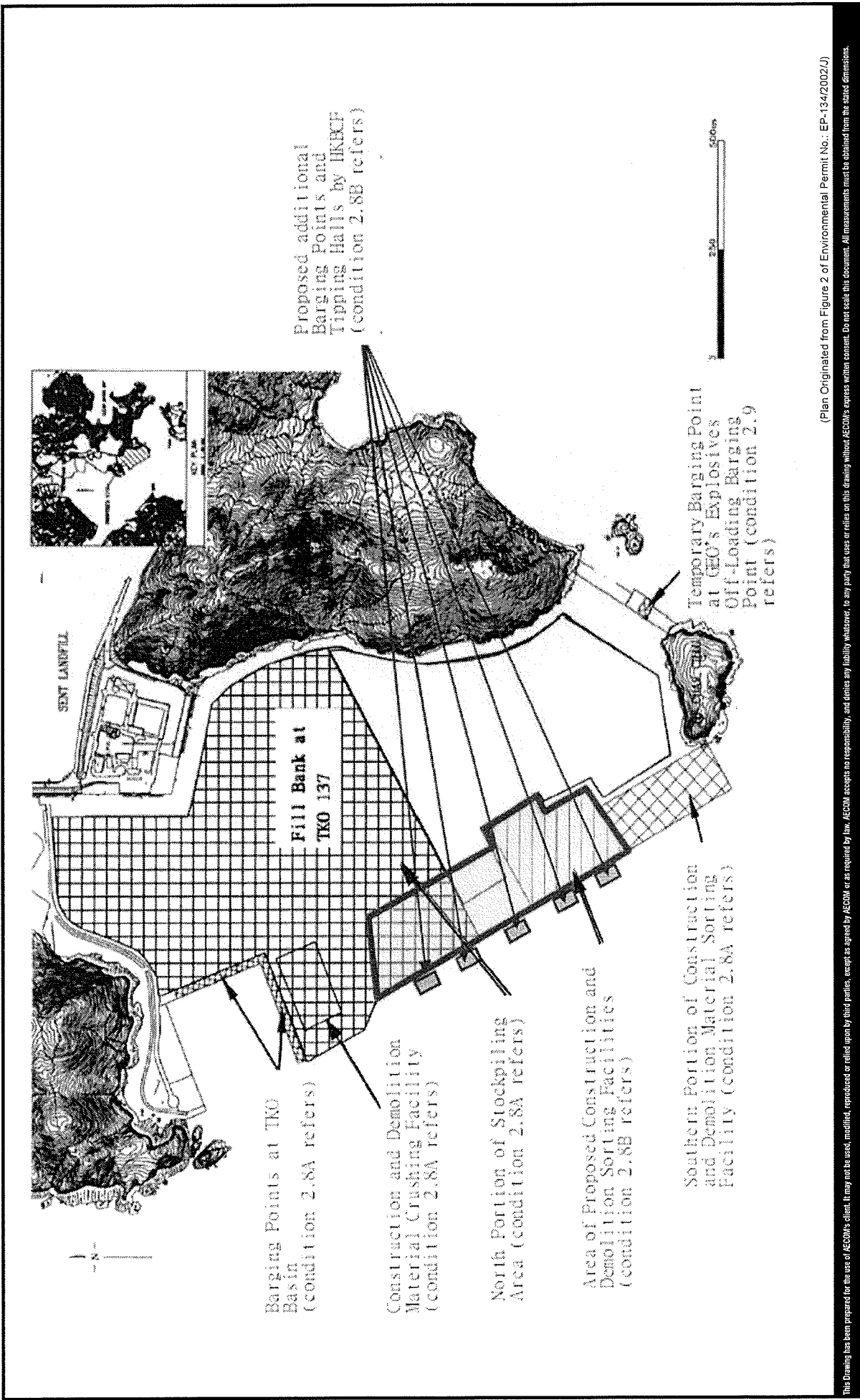
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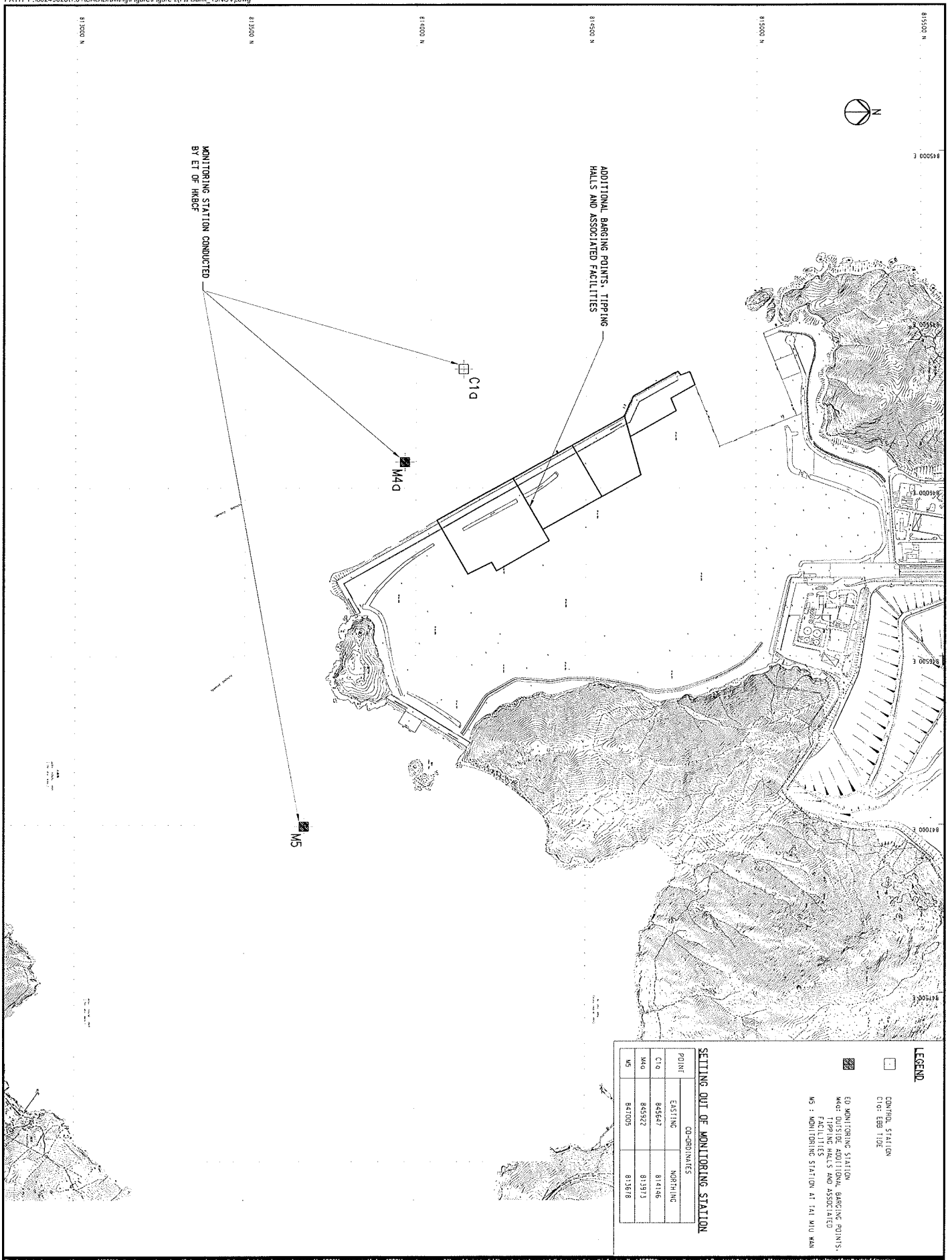
**FIGURES**

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**APPENDIX A  
CALIBRATION RECORDS**

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### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. :	<u>ET/EW/008/005</u>	Manufacturer :	<u>YSI</u>
Model No. :	<u>Pro 2030</u>	Serial No. :	<u>12A 100353</u>
Date of Calibration :	<u>25/08/2012</u>	Calibration Due Date :	<u>24/11/2012</u>

#### Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/001

Ref. No. of Water Bath : ---

Temperature (°C)				
Reference Thermometer reading	Measured	20.2	Corrected	19.8
DO Meter reading	Measured	19.7	Difference	0.1

#### Standardization of sodium thiosulphate ( $\text{Na}_2\text{S}_2\text{O}_3$ ) solution

Reagent No. of $\text{Na}_2\text{S}_2\text{O}_3$ titrant	CPE/012/4.5/001/5	Reagent No. of 0.025N $\text{K}_2\text{Cr}_2\text{O}_7$	CPE/012/4.4/001/12
		Trial 1	Trial 2
Initial Vol. of $\text{Na}_2\text{S}_2\text{O}_3$ (ml)		0.00	0.00
Final Vol. of $\text{Na}_2\text{S}_2\text{O}_3$ (ml)		40.10	40.05
Vol. of $\text{Na}_2\text{S}_2\text{O}_3$ used (ml)		40.10	40.05
Normality of $\text{Na}_2\text{S}_2\text{O}_3$ solution (N)		0.02494	0.02497
Average Normality (N) of $\text{Na}_2\text{S}_2\text{O}_3$ solution (N)		0.02496	
Acceptance criteria, Deviation		Less than $\pm 0.001\text{N}$	

Calculation: Normality of  $\text{Na}_2\text{S}_2\text{O}_3$ ,  $N = 1 / \text{ml } \text{Na}_2\text{S}_2\text{O}_3 \text{ used}$

#### Linearity Checking

##### Determination of dissolved oxygen content by Winkler Titration \*

Purging Time (min)	2		5		10	
Trial	1	2	1	2	1	2
Initial Vol. of $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	0.00	11.20	22.20	0.00	7.60	12.30
Final Vol. of $\text{Na}_2\text{S}_2\text{O}_3$ (ml)	11.20	22.20	29.90	7.60	12.30	17.20
Vol. (V) of $\text{Na}_2\text{S}_2\text{O}_3$ used (ml)	11.20	11.00	7.70	7.60	4.70	4.90
Dissolved Oxygen (DO), mg/L	7.50	7.37	5.16	5.09	3.15	3.28
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $\text{DO (mg/L)} = V \times N \times 8000/298$

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.51	7.60	7.56	7.50	7.37	7.44	1.60
5	5.21	5.20	5.21	5.16	5.09	5.13	1.55
10	3.19	3.25	3.22	3.15	3.28	3.22	0.00
Linear regression coefficient				0.99990			



## Internal Calibration Report of Dissolved Oxygen Meter

### *Zero Point Checking*

DO meter reading, mg/L	0.00
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### *Salinity Checking*

Reagent No. of NaCl (10ppt)	CPE/012/4.7/001/28	Reagent No. of NaCl (30ppt)	CPE/012/4.8/001/28
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### *Determination of dissolved oxygen content by Winkler Titration \*\**

Salinity (ppt)	10		30	
	1	2	1	2
Trial				
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.50	23.20	33.90
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.50	23.20	33.90	44.40
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.50	11.70	10.70	10.50
Dissolved Oxygen (DO), mg/L	7.71	7.84	7.17	7.04
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $DO (mg/L) = V \times N \times 8000/298$

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.7	7.65	7.68	7.71	7.84	7.78	1.29
30	7.13	7.05	7.09	7.17	7.04	7.11	0.28

### *Acceptance Criteria*

- (1) Difference between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / unacceptable # for use.

# Delete as appropriate

Calibrated by

:

Approved by :





### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/005</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A 100353</u>
Date of Calibration : <u>10/11/2012</u>	Calibration Due Date : <u>09/02/2013</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/001  
 Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.4	Corrected	20.0
DO Meter reading	Measured	19.8	Difference	0.2

**Standardization of sodium thiosulphate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) solution**

Reagent No. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrant	CPE/012/4.5/001/5	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/001/12
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	0.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		40.55	40.50
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		40.55	40.50
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02466	0.02469
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02468	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 1 / ml Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> used

**Linearity Checking**

**Determination of dissolved oxygen content by Winkler Titration \***

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Trial						
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.40	22.60	0.00	7.70	12.60
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.40	22.60	30.40	7.70	12.60	17.50
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.40	11.20	7.80	7.70	4.90	4.90
Dissolved Oxygen (DO), mg/L	7.55	7.42	5.17	5.10	3.25	3.25
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.41	7.52	7.47	7.55	7.42	7.49	0.27
5	5.23	5.18	5.21	5.17	5.10	5.14	1.35
10	3.20	3.27	3.24	3.25	3.25	3.25	0.31
Linear regression coefficient				0.99950			



### Internal Calibration Report of Dissolved Oxygen Meter

**Zero Point Checking**

DO meter reading, mg/L	0.00
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**Salinity Checking**

Reagent No. of NaCl (10ppt)	CPE/012/4.7/001/28	Reagent No. of NaCl (30ppt)	CPE/012/4.8/001/28
-----------------------------	--------------------	-----------------------------	--------------------

**Determination of dissolved oxygen content by Winkler Titration \*\***

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.60	23.40	34.20
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.60	23.40	34.20	44.90
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.60	11.80	10.80	10.70
Dissolved Oxygen (DO), mg/L	7.69	7.82	7.16	7.09
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation:  $DO (mg/L) = V \times N \times 8000/298$

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.78	7.69	7.74	7.69	7.82	7.76	0.26
30	7.13	7.07	7.1	7.16	7.09	7.13	0.42

**Acceptance Criteria**

- (1) Differenc between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / ~~unacceptable~~ # for use.

# Delete as appropriate

Calibrated by

:

Approved by :



## Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/005      Manufacturer : YSI

Model No. : Pro 2030      Serial No. : 12A 100353

Date of Calibration : 25/08/2012      Due Date : 24/11/2012

Ref. No. of Salinity Standard used (30ppt)

S/001/3

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.2	0.66

Acceptance Criteria

Difference : <10 %

The salinity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by :

Approved by :



## Performance Check of Salinity Meter

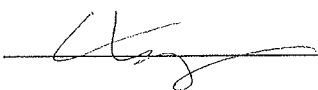

Equipment Ref. No. : ET/EW/008/005      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 12A 100353  
Date of Calibration : 10/11/2012      Due Date : 09/02/2013

Ref. No. of Salinity Standard used (30ppt)	S/001/4
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Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.4	31.1	2.28

Acceptance Criteria      Difference : <10 %

The salinity meter complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / ~~unacceptable~~ \* for use. Measurements are traceable to national standards.

Checked by :       Approved by : 



## Performance Check of Turbidimeter


Equipment Ref. No. : ET/0505/009                      Manufacturer : HACH  
Model No. : 2100Q                                      Serial No. : 11060 C 010010  
Date of Calibration : 09/10/2012                      Due Date : 08/01/2013


Gelex Vial Std	Theoretical Value (NTU)	Measured Value (NTU)	Difference %
0-10 NTU	5.30	5.12	0.86
10-100 NTU	52.0	51.1	0.73
100-1000 NTU	540	532	0.70

Acceptance Criteria

Difference : <5 %

The ~~salinity meter~~ <sup>Turbidimeter</sup> complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / unacceptable \* for use. Measurements are traceable to national standards.

Checked by : 

Approved by : 

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**APPENDIX B  
IMPACT MONITORING SCHEDULES**

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Contract No. HY/2010/02 - Hong Kong-Zhuhai-Macao Bridge  
 Hong Kong Boundary Crossing Facilities – Reclamation Works  
 Impact Water Quality Monitoring Schedule for November 2012 (TKO 137 Fill Bank)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01-Nov	02-Nov	03-Nov
04-Nov	05-Nov	06-Nov	07-Nov	08-Nov	09-Nov	10-Nov
	Impact Water Quality Monitoring Mid-Flood 11:53 Mid-Ebb 16:33		Impact Water Quality Monitoring Mid-Flood 14:20 Mid-Ebb 19:47		Impact Water Quality Monitoring Mid-Ebb 08:32 Mid-Flood 15:34	
11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov
	Impact Water Quality Monitoring Mid-Ebb 11:28 Mid-Flood 17:16		Impact Water Quality Monitoring Mid-Ebb 13:11 Mid-Flood 18:30		Impact Water Quality Monitoring Mid-Flood 09:20 Mid-Ebb 14:50	
18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov
	Impact Water Quality Monitoring Mid-Flood 12:11 Mid-Ebb 17:38		Impact Water Quality Monitoring Mid-Flood 14:22 Mid-Ebb 20:35		Impact Water Quality Monitoring Mid-Ebb 09:00 Mid-Flood 15:47	
25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	
	Impact Water Quality Monitoring Mid-Ebb 11:32 Mid-Flood 17:12		Impact Water Quality Monitoring Mid-Ebb 12:46 Mid-Flood 18:04		Impact Water Quality Monitoring Mid-Flood 08:41 Mid-Ebb 13:52	

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**APPENDIX C  
IMPACT WATER QUALITY MONITORING  
RESULTS AND THEIR GRAPHICAL  
PRESENTATION**

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**Mid-Ebb Tide**

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/11/12	1224-1240	22/Fine	Small Wave	19.4	Surface	25.4	26.2	5.8	5.8	83.9	3.8	4.8	3.8	3.7	4.8		
						25.4	26.3	5.8	5.8	83.4	3.7	4.8					
						25.3	26.5	5.7	5.7	82.9	3.8	4.8					
						25.3	26.5	5.7	5.7	83.2	3.8	4.6					
						25.2	26.7	5.6	5.6	81.2	3.9	5.0					
						25.2	26.8	5.6	5.6	80.9	4.0	5.2					
05/11/12	1524-1542	25/Fine	Small Wave	19.6	Surface	25.4	26.3	5.8	5.8	82.2	3.6	4.4	3.7	4.6			
						25.3	26.3	5.8	5.8	81.7	3.7	4.8					
						25.1	26.4	5.7	5.7	80.7	3.9	4.8					
						25.1	26.4	5.8	5.8	81.3	3.8	4.8					
						25.1	26.7	5.7	5.7	79.6	3.9	5.0					
						25.0	26.6	5.7	5.7	80.3	3.9	5.0					
07/11/12	1723-1740	24/Fine	Small Wave	19.2	Surface	25.4	26.3	5.9	5.9	83.3	3.4	4.2	3.4	4.3			
						25.4	26.4	5.9	5.9	83.2	3.4	4.4					
						25.3	26.5	5.9	5.8	82.6	3.6	4.4					
						25.3	26.5	5.8	5.8	81.5	3.7	4.8					
						25.2	26.6	5.7	5.7	79.8	3.8	4.8					
						25.2	26.7	5.7	5.7	79.8	3.8	4.9					
09/11/12	0752-0808	24/Fine	Small Wave	19.0	Surface	25.2	26.3	5.9	5.9	82.4	3.6	4.2	3.6	4.3			
						25.2	26.3	5.9	5.9	82.1	3.6	4.4					
						25.1	26.6	5.8	5.8	81.1	3.7	4.8					
						25.1	26.6	5.7	5.7	80.4	3.7	4.8					
						25.0	26.8	5.7	5.7	79.7	3.8	4.8					
						25.0	26.8	5.6	5.6	78.8	3.9	5.0					
12/11/12	0955-1012	23/Fine	Small Wave	18.8	Surface	24.3	26.4	5.8	5.8	81.3	3.6	4.4	3.6	4.6			
						24.3	26.3	5.8	5.8	80.9	3.7	4.8					
						24.2	26.5	5.7	5.7	79.6	3.8	4.8					
						24.2	26.5	5.7	5.7	80.0	3.8	4.8					
						24.1	26.7	5.6	5.6	78.5	3.9	4.8					
						24.0	26.6	5.7	5.7	79.0	3.9	5.0					
14/11/12	1124-1142	25/Cloudy	Small Wave	18.8	Surface	24.6	26.7	5.8	5.8	81.3	3.6	4.4	3.6	4.6			
						24.6	26.8	5.8	5.8	80.9	3.6	4.8					
						24.7	26.8	5.7	5.7	79.7	3.7	4.8					
						24.7	26.8	5.7	5.7	80.1	3.7	4.8					
						24.7	26.9	5.6	5.6	78.4	3.8	4.8					
						24.8	26.9	5.6	5.6	78.7	3.8	4.8					
16/11/12	1320-1330	25/Cloudy	Great Wave	19.2	Surface	24.2	27.2	6.6	6.6	92.3	3.9	4.8	4.0	5.0			
						24.2	27.2	6.6	6.6	92.5	4.0	5.2					
						24.3	27.3	6.7	6.7	93.0	3.8	4.8					
						24.3	27.4	6.6	6.6	92.3	3.8	4.8					
						24.3	27.3	6.6	6.6	92.7	4.0	5.0					
						24.4	27.4	6.6	6.6	92.2	4.0	5.0					
19/11/12	1553-1610	23/Fine	Small Wave	17.8	Surface	24.4	27.1	6.4	6.4	88.5	4.0	4.8	4.0	5.0			
						24.5	27.2	6.4	6.4	88.9	4.0	5.2					
						24.5	27.2	6.3	6.2	87.2	4.0	4.8					
						24.5	27.2	6.2	6.2	86.7	4.1	4.9					
						24.5	27.3	6.1	6.1	85.0	4.2	5.0					
						24.6	27.4	6.1	6.1	85.4	4.2	5.1					

**Mid-Ebb Tide**

Monitoring Station : C 1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
21/11/12	1753-1810	23/Drizzle	Small Wave	17.6	Surface	24.1	27.3	6.3	87.1	3.2	4.0	3.4	4.0	4.2	4.5		
						24.1	27.4	6.2	86.6	3.2	4.4						
						24.2	27.4	6.1	85.2	3.4	4.4						
						24.2	27.5	6.1	85.3	3.5	4.6						
						24.3	27.5	6.1	84.3	3.7	4.8						
						24.3	27.5	6.1	84.6	3.6	4.8						
23/11/12	0753-0810	24/Rainy	Great Wave	17.4	Surface	24.1	27.3	6.2	86.4	3.2	4.0	3.5	4.0	4.5	4.5		
						24.0	27.3	6.2	86.1	3.3	4.4						
						24.1	27.4	6.2	85.7	3.5	4.4						
						24.2	27.4	6.1	85.5	3.5	4.6						
						24.2	27.4	6.1	84.9	3.7	4.6						
						24.3	27.5	6.1	84.5	3.7	4.8						
26/11/12	1526-1544	19/Cloudy	Great Wave	17.8	Surface	23.8	27.3	6.3	87.7	3.3	4.2	3.3	4.2	4.3	4.5		
						23.9	27.3	6.3	87.4	3.3	4.4						
						23.9	27.4	6.2	86.9	3.4	4.4						
						23.9	27.4	6.2	86.0	3.4	4.6						
						23.9	27.4	6.2	85.9	3.8	4.6						
						24.0	27.5	6.1	85.2	3.7	4.8						
28/11/12	1123-1139	18/Cloudy	Great Wave	17.6	Surface	23.0	27.1	6.2	85.5	3.4	4.4	3.6	4.4	4.8	4.7		
						22.9	27.2	6.2	86.0	3.4	4.4						
						22.9	27.3	6.1	84.4	3.6	4.8						
						22.8	27.4	6.1	84.0	3.6	4.8						
						22.8	27.6	5.9	82.1	3.9	4.8						
						22.8	27.5	5.9	81.2	3.9	5.0						
30/11/12	1225-1242	25/Drizzle	Small Wave	17.4	Surface	23.2	27.0	6.3	87.8	3.3	4.0	3.5	4.0	4.5	4.5		
						23.2	27.1	6.3	87.3	3.4	4.4						
						23.3	27.3	6.2	85.9	3.5	4.4						
						23.4	27.3	6.2	85.3	3.5	4.6						
						23.5	27.5	6.0	83.4	3.7	4.8						
						23.6	27.6	6.0	82.8	3.7	4.6						

# Mid-Flood Tide

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)	
							Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
02/11/12	1723-1740	25/Fine	Small Wave	20.2	Surface	25.5	26.2	26.2	5.9	84.9	3.6	3.6	4.8	4.8	
					Middle	25.4	26.2	5.8	84.7	3.6	4.8				
						25.3	26.3	5.8	84.2	3.7	3.8	4.8	4.7		
					Bottom	25.4	26.4	5.8	84.4	3.8	4.6				
						25.1	26.8	5.7	83.2	3.9	4.8	4.9			
					25.2	26.7	5.8	83.5	3.9	5.0	5.0				
05/11/12	1052-1109	24/Fine	Small Wave	20.4	Surface	25.3	26.2	26.3	5.9	82.9	3.6	3.6	4.4	4.6	
					Middle	25.2	26.3	5.9	82.6	3.6	4.8				
						25.1	26.4	5.9	82.1	3.7	3.7	4.6	4.7		
					Bottom	25.1	26.6	5.8	81.5	3.8	4.8	4.9			
						25.1	26.7	5.8	81.6	3.9	5.0	5.0			
					25.2	26.2	5.9	82.9	3.6	4.4	4.4				
25.3	26.3	5.9	82.5	3.5	4.4	4.4									
07/11/12	1224-1242	23/Fine	Small Wave	20.0	Surface	25.2	26.4	26.5	5.8	82.0	3.7	3.7	4.4	4.5	
					Middle	25.2	26.5	5.8	82.2	3.7	4.6	4.5			
						25.1	26.6	5.8	81.2	3.8	4.8	4.9			
					Bottom	25.1	26.6	5.8	81.4	3.8	5.0	5.0			
						25.2	26.6	5.8	81.4	3.7	4.6	4.7			
					25.0	26.7	5.8	81.1	3.7	4.6	4.6				
25.0	26.8	5.7	80.6	3.7	4.8	4.8									
09/11/12	1353-1410	26/Fine	Small Wave	19.8	Surface	25.3	26.3	26.3	5.9	83.4	3.5	3.5	4.4	4.4	
					Middle	25.4	26.2	6.0	83.7	3.4	4.4				
						25.2	26.5	5.9	82.1	3.6	4.4	4.5			
					Bottom	25.1	26.6	5.8	81.4	3.6	4.6	4.6			
						25.0	26.7	5.8	81.1	3.7	4.6	4.7			
					25.0	26.8	5.7	80.6	3.7	4.8	4.8				
12/11/12	1554-1610	25/Fine	Small Wave	19.4	Surface	24.5	26.4	26.5	6.0	83.3	3.5	3.5	4.4	4.5	
					Middle	24.4	26.5	6.0	83.0	3.5	4.6	4.5			
						24.3	26.6	5.8	81.7	3.6	4.4	4.3			
					Bottom	24.4	26.6	5.9	82.2	3.6	4.2	4.3			
						24.2	26.8	5.7	79.8	3.7	4.8	4.7			
					24.2	26.7	5.7	79.5	3.8	4.6	4.6				
24.8	26.8	5.9	82.5	3.2	4.4	4.3									
24.7	26.9	5.9	82.3	3.2	4.2	4.2									
14/11/12	1622-1637	26/Fine	Small Wave	26.2	Surface	24.8	27.0	27.0	5.8	80.9	3.6	3.6	4.4	4.6	
					Middle	24.8	27.0	5.8	80.4	3.7	4.6	4.5			
						24.9	27.0	5.8	80.6	3.8	4.8	4.9			
					Bottom	24.9	27.1	5.8	80.6	3.9	5.0	4.9			
						24.3	27.2	6.3	88.0	3.9	4.8	4.8			
					24.4	27.1	6.3	87.8	3.9	4.8	4.8				
16/11/12	0754-0811	23/Cloudy	Small Wave	18.2	Surface	24.4	27.3	27.3	6.2	86.3	4.0	4.0	4.8	4.9	
					Middle	24.4	27.2	6.2	86.1	4.0	5.0	4.9			
						24.5	27.3	6.1	84.6	4.1	4.8	4.9			
					Bottom	24.4	27.4	6.1	85.1	4.1	5.0	4.9			
						24.0	27.3	6.3	87.7	3.2	4.0	4.2			
					24.0	27.3	6.3	87.1	3.2	4.4	4.2				
24.3	27.4	6.1	85.3	3.4	4.2	4.3									
24.2	27.4	6.2	85.7	3.5	4.4	4.4									
24.3	27.4	6.0	84.2	3.7	4.8	4.8									
24.3	27.3	6.1	84.5	3.6	4.6	4.6									
19/11/12	1055-1115	22/Cloudy	Small Wave	18.2	Surface	24.3	27.3	27.4	6.1	84.4	3.6	3.6	4.4	4.4	
					Middle	24.3	27.4	6.1	85.3	3.4	4.2	4.3			
						24.2	27.4	6.2	85.7	3.5	4.4	4.4			
					Bottom	24.3	27.4	6.0	84.2	3.7	4.8	4.8			
						24.3	27.3	6.1	84.5	3.6	4.6	4.6			

**Mid-Flood Tide**

Monitoring Station : C1a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)	
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
21/11/12	1226-1244	24/Cloudy	Small Wave	18.4	Surface	24.2	27.3	27.3	6.3	88.0	3.2	4.0	3.2	4.0	4.0	4.0
						24.2	27.3	27.3	6.3	87.4	3.2	4.0				
						24.3	27.4	27.4	6.1	85.6	3.4	4.2				
					Middle	24.3	27.4	27.4	6.2	86.0	3.5	4.4	3.4	4.3	4.3	
						24.4	27.4	27.4	6.1	84.8	3.6	4.6				
						24.4	27.3	27.3	6.1	85.0	3.6	4.6				
23/11/12	1354-1411	22/Cloudy	Small Wave	17.8	Surface	24.1	27.3	27.3	6.3	87.4	3.3	4.4	3.4	4.4	4.4	
						24.2	27.3	27.3	6.3	87.1	3.4	4.4				
						24.2	27.4	27.4	6.2	86.5	3.5	4.4				
					Middle	24.2	27.3	27.3	6.2	86.0	3.5	4.6	3.6	4.6	4.6	
						24.3	27.4	27.4	6.1	85.5	3.9	4.8				
						24.3	27.5	27.5	6.1	85.0	3.8	4.9				
26/11/12	0954-1011	19/Cloudy	Small Wave	17.4	Surface	23.8	27.3	27.3	6.3	87.0	3.3	4.4	3.3	4.4	4.4	
						23.8	27.4	27.4	6.2	86.7	3.4	4.2				
						23.9	27.4	27.4	6.2	86.2	3.5	4.4				
					Middle	23.9	27.4	27.4	6.1	85.5	3.5	4.6	3.5	4.6	4.6	
						24.0	27.5	27.5	6.1	85.2	3.8	4.8				
						24.0	27.5	27.5	6.1	84.5	3.8	4.8				
28/11/12	1653-1709	20/Cloudy	Great Wave	18.4	Surface	23.1	27.2	27.2	6.2	85.8	3.3	4.1	3.3	4.1	4.1	
						23.0	27.2	27.2	6.3	86.5	3.3	4.2				
						22.8	27.4	27.4	6.1	84.0	3.5	4.4				
					Middle	22.8	27.3	27.3	6.1	83.9	3.5	4.6	3.5	4.6	4.6	
						22.9	27.5	27.5	5.9	81.4	3.8	4.8				
						22.8	27.5	27.5	6.0	82.2	3.8	4.9				
30/11/12	1627-1644	21/Drizzle	Small Wave	17.8	Surface	23.3	27.1	27.1	6.5	89.4	3.2	4.0	3.2	4.0	4.0	
						23.3	27.0	27.0	6.4	89.0	3.3	4.0				
						23.4	27.2	27.2	6.2	86.2	3.4	4.4				
					Middle	23.4	27.3	27.3	6.3	86.8	3.3	4.3	3.4	4.3	4.3	
						23.4	27.3	27.3	6.3	86.8	3.3	4.2				
						23.5	27.5	27.5	6.1	84.7	3.6	4.4				
Bottom	23.6	27.5	27.5	6.1	85.1	3.6	4.5	3.6	4.5	4.5						

**Mid-Ebb Tide**

Monitoring Station : M4a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/11/12	1246-1304	22/Fine	Small Wave	19.3	Surface	25.4	26.2	5.8	84.2	3.6	4.4	3.6	84.0	3.6	4.4		
						25.4	26.3	5.8	83.7	3.6	4.8						
						25.3	26.5	5.8	83.5	3.8	4.6						
					Middle	25.3	26.5	5.7	83.2	3.7	4.6	3.8	83.4	3.7	4.6		
						25.2	26.6	5.7	82.8	3.9	4.8						
						25.2	26.7	5.7	82.5	4.0	5.0						
05/11/12	1547-1604	25/Fine	Small Wave	19.2	Surface	25.3	26.4	5.9	82.6	3.6	4.2	3.5	82.3	3.5	4.2		
						25.4	26.3	5.8	81.9	3.5	4.4						
						25.1	26.5	5.8	81.1	3.7	4.4						
					Middle	25.2	26.6	5.7	80.6	3.7	4.6	3.7	80.9	3.7	4.5		
						25.1	26.8	5.7	80.7	3.9	4.8						
						25.1	26.7	5.7	80.1	3.9	4.8						
07/11/12	1746-1803	24/Fine	Small Wave	18.8	Surface	25.5	26.2	5.9	81.9	3.4	4.0	3.4	82.1	3.4	4.0		
						25.4	26.3	5.8	82.2	3.4	4.2						
						25.3	26.4	5.8	81.6	3.6	4.4						
					Middle	25.3	26.4	5.8	81.2	3.6	4.6	3.6	81.4	3.6	4.5		
						25.2	26.7	5.7	80.4	3.9	4.8						
						25.2	26.7	5.7	80.4	3.9	4.8						
09/11/12	0813-0829	24/Fine	Small Wave	18.6	Surface	25.2	26.3	5.9	82.9	3.5	4.4	3.5	82.9	3.5	4.3		
						25.2	26.4	5.9	82.9	3.4	4.2						
						25.1	26.6	5.8	81.7	3.6	4.6						
					Middle	25.1	26.6	5.8	81.7	3.6	4.8	3.6	81.7	3.6	4.7		
						25.0	26.7	5.7	80.4	3.8	4.6						
						25.0	26.8	5.7	79.9	3.8	4.8						
12/11/12	1017-1034	23/Fine	Small Wave	18.2	Surface	24.3	26.3	5.9	82.6	3.5	4.4	3.5	82.2	3.5	4.5		
						24.2	26.3	5.9	81.8	3.6	4.6						
						24.2	26.4	5.8	81.0	3.6	4.4						
					Middle	24.2	26.5	5.8	80.3	3.6	4.4	3.6	80.7	3.6	4.4		
						24.1	26.6	5.7	78.8	3.8	4.8						
						24.1	26.7	5.6	78.2	3.8	5.0						
14/11/12	1147-1204	25/Cloudy	Small Wave	18.6	Surface	24.7	26.7	5.9	82.6	3.6	4.4	3.6	82.3	3.6	4.5		
						24.7	26.7	5.9	82.0	3.6	4.6						
						24.7	26.7	5.8	81.1	3.7	4.8						
					Middle	24.8	26.8	5.7	80.4	3.6	4.6	3.7	80.8	3.7	4.7		
						24.8	26.8	5.6	78.5	3.8	4.6						
						24.8	26.9	5.6	78.3	3.8	4.7						
16/11/12	1333-1345	25/Cloudy	Great Wave	19.0	Surface	24.2	27.3	6.5	91.2	3.7	4.8	3.7	91.0	3.7	4.7		
						24.2	27.2	6.5	90.7	3.7	4.6						
						24.3	27.3	6.6	92.3	3.8	4.8						
					Middle	24.3	27.3	6.6	92.0	3.9	5.0	3.7	92.2	3.8	4.9		
						24.3	27.3	6.6	91.8	3.7	4.8						
						24.4	27.4	6.6	92.3	3.7	4.6						
19/11/12	1613-1630	23/Fine	Small Wave	18.2	Surface	24.4	27.2	6.3	87.4	3.7	4.6	3.7	87.6	3.7	4.7		
						24.5	27.1	6.3	87.8	3.7	4.8						
						24.4	27.2	6.2	86.5	3.8	4.8						
					Middle	24.5	27.3	6.2	85.8	3.7	4.4	3.8	86.2	3.8	4.6		
						24.5	27.3	6.1	84.4	3.9	4.8						
						24.6	27.3	6.1	84.8	3.9	5.0						

**Mid-Ebb Tide**

Monitoring Station : M4a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)		Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)		Depth-average
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	
21/11/12	1813-1830	23/Drizzle	Small Wave	18.0	Surface	24.1	27.4	6.3	6.3	88.0	87.8	3.5	3.5	4.4	4.3	3.6	4.4
					Middle	24.1	27.4	6.1	6.1	87.5	84.7	3.5	3.5	4.2	4.4		
					Bottom	24.2	27.4	6.0	6.0	84.8	83.0	3.4	3.7	4.6	4.6		
23/11/12	0813-0830	23/Rainy	Great Wave	17.8	Surface	24.3	27.5	5.9	6.0	83.2	83.0	3.7	3.7	4.4	4.6	3.6	4.5
					Middle	24.1	27.4	6.0	6.0	87.4	87.3	3.6	3.5	4.4	4.3		
					Bottom	24.2	27.5	5.9	5.9	87.1	84.1	3.5	3.5	4.6	4.5		
26/11/12	1549-1606	19/Cloudy	Great Wave	18.4	Surface	24.3	27.5	5.9	6.1	83.9	82.6	3.8	3.7	4.6	4.7	3.5	4.5
					Middle	23.8	27.3	6.4	6.4	82.8	82.6	3.4	3.4	4.2	4.4		
					Bottom	23.9	27.4	6.2	6.2	82.4	88.6	3.4	3.4	4.6	4.4		
28/11/12	1145-1202	18/Cloudy	Great Wave	17.4	Surface	24.0	27.5	6.1	6.1	86.9	86.6	3.4	3.4	4.4	4.5	3.5	4.5
					Middle	24.0	27.4	6.2	6.2	86.3	86.6	3.5	3.5	4.6	4.5		
					Bottom	24.0	27.5	6.1	6.1	84.8	84.5	3.7	3.7	4.6	4.7		
30/11/12	1250-1307	25/Drizzle	Small Wave	17.6	Surface	23.0	27.2	6.2	6.2	84.2	86.1	3.4	3.4	4.2	4.3	3.6	4.6
					Middle	22.9	27.4	6.2	6.1	85.8	84.9	3.6	3.6	4.4	4.7		
					Bottom	22.9	27.4	6.1	6.1	85.1	84.9	3.7	3.7	4.6	4.7		
30/11/12	1250-1307	25/Drizzle	Small Wave	17.6	Surface	22.8	27.5	5.9	5.9	84.6	81.3	3.8	3.8	5.0	4.8	3.5	4.4
					Middle	23.3	27.1	6.3	6.3	81.0	86.6	3.3	3.3	4.0	4.1		
					Bottom	23.2	27.1	6.2	6.1	86.8	86.6	3.3	3.3	4.2	4.1		
30/11/12	1250-1307	25/Drizzle	Small Wave	17.6	Surface	23.4	27.3	6.1	6.1	86.4	84.6	3.5	3.5	4.4	4.5	3.5	4.4
					Middle	23.4	27.3	6.1	6.1	84.8	84.6	3.5	3.5	4.4	4.5		
					Bottom	23.6	27.5	6.0	5.9	84.3	82.3	3.7	3.8	4.6	4.7		
						23.5	27.5	5.9	5.9	82.1	82.3	3.8	3.8	4.8	4.7		

## Mid-Flood Tide

Monitoring Station : M/4a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Dissolved Oxygen		Turbidity (NTU)		Suspended Solids (mg/L)		Depth-average
							Value	Average	Value	Depth-average	Value	Average	Value	Average	Value	Average	
02/11/12	1746-1803	25/Fine	Small Wave	20.0	Surface	25.4	26.3	26.3	86.6	86.1	3.5	3.5	4.4	4.3	4.6		
						25.5	26.3	26.3	85.6	86.1	3.4	3.4	4.2	4.3			
						25.3	26.5	26.5	84.4	84.8	3.6	3.6	4.6	4.7			
						25.3	26.4	26.4	85.1	84.8	3.7	3.7	4.8	4.8			
						25.2	26.7	26.7	83.9	84.1	3.9	3.8	4.8	4.9			
						25.2	26.7	26.7	84.2	84.1	3.8	3.8	5.0	4.9			
05/11/12	1113-1129	24/Fine	Small Wave	20.2	Surface	25.3	26.3	26.4	84.5	84.1	3.4	3.4	4.2	4.1	4.4		
						25.3	26.4	26.4	83.6	84.1	3.4	3.4	4.0	4.0			
						25.3	26.5	26.5	82.4	82.5	3.6	3.6	4.4	4.5			
						25.2	26.6	26.6	82.6	82.5	3.6	3.6	4.6	4.6			
						25.1	26.7	26.8	82.2	82.6	3.9	3.8	4.6	4.7			
						25.1	26.8	26.8	82.9	82.6	3.8	3.8	4.8	4.7			
07/11/12	1247-1304	23/Fine	Small Wave	19.4	Surface	25.3	26.4	26.4	84.0	83.7	3.5	3.4	4.2	4.2	4.5		
						25.3	26.4	26.4	83.3	83.7	3.4	3.4	4.2	4.2			
						25.2	26.5	26.6	82.3	82.1	3.6	3.6	4.4	4.5			
						25.1	26.6	26.6	81.8	82.1	3.7	3.7	4.6	4.6			
						25.1	26.7	26.8	81.6	81.3	3.8	3.8	5.0	4.9			
						25.1	26.8	26.8	80.9	81.3	3.8	3.8	4.8	4.9			
09/11/12	1415-1431	26/Fine	Small Wave	19.2	Surface	25.4	26.3	26.3	84.8	84.5	3.4	3.4	4.2	4.3	4.4		
						25.4	26.3	26.3	84.2	84.5	3.4	3.4	4.4	4.4			
						25.3	26.5	26.6	83.5	83.3	3.4	3.4	4.4	4.5			
						25.2	26.6	26.6	83.0	83.3	3.5	3.5	4.6	4.6			
						25.1	26.7	26.7	82.5	82.3	3.5	3.6	4.4	4.5			
						25.0	26.7	26.7	82.0	82.3	3.6	3.6	4.6	4.6			
12/11/12	1615-1632	25/Fine	Small Wave	19.0	Surface	24.5	26.4	26.5	84.7	84.4	3.4	3.4	4.2	4.4	4.5		
						24.5	26.5	26.5	84.1	84.4	3.4	3.4	4.6	4.6			
						24.4	26.5	26.5	83.6	83.0	3.5	3.5	4.4	4.6			
						24.4	26.5	26.5	82.4	83.0	3.5	3.5	4.8	4.6			
						24.3	26.7	26.7	81.7	81.5	3.6	3.6	4.6	4.6			
						24.2	26.7	26.7	81.2	81.5	3.6	3.6	4.6	4.6			
14/11/12	1641-1657	26/Fine	Small Wave	20.1	Surface	24.8	26.8	26.8	83.2	83.1	3.4	3.4	4.2	4.4	4.5		
						24.8	26.8	26.8	82.9	83.1	3.5	3.5	4.6	4.4			
						24.8	26.9	26.9	82.2	82.2	3.5	3.6	4.4	4.5			
						24.8	26.9	26.9	82.2	82.2	3.6	3.6	4.6	4.6			
						24.9	27.0	27.0	80.9	80.8	3.6	3.7	4.6	4.7			
						24.9	27.0	27.0	80.6	80.8	3.7	3.7	4.8	4.7			
16/11/12	0814-0832	23/Cloudy	Small Wave	19.0	Surface	24.3	27.2	27.2	87.9	87.8	3.6	3.6	4.4	4.5	4.7		
						24.4	27.2	27.2	87.6	87.8	3.7	3.7	4.6	4.6			
						24.3	27.3	27.3	86.4	86.2	3.7	3.7	4.6	4.7			
						24.4	27.2	27.2	86.0	86.2	3.8	3.8	4.8	4.8			
						24.4	27.3	27.4	85.3	85.0	3.9	3.9	4.8	4.9			
						24.5	27.4	27.4	84.7	85.0	3.9	3.9	5.0	4.9			
19/11/12	1120-1135	22/Cloudy	Small Wave	18.8	Surface	24.0	27.3	27.4	88.4	88.1	3.5	3.5	4.2	4.3	4.5		
						24.1	27.4	27.4	87.8	88.1	3.4	3.4	4.4	4.4			
						24.2	27.4	27.4	84.6	84.5	3.4	3.4	4.6	4.5			
						24.2	27.4	27.4	84.3	84.5	3.4	3.4	4.4	4.5			
						24.2	27.4	27.4	83.3	83.1	3.7	3.7	4.8	4.7			
						24.3	27.3	27.3	82.8	83.1	3.7	3.7	4.6	4.7			

## Mid-Flood Tide

Monitoring Station : M4a

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
21/11/12	1249-1306	24/Cloudy	Small Wave	18.6	Surface	24.2	27.3	6.4	6.3	88.5	3.5	3.4	4.6	4.5			
						24.3	27.4	6.3	6.3	88.1	3.4	4.4					
						24.3	27.4	6.1	6.1	84.9	3.4	3.4	4.2				
						24.4	27.4	6.1	6.1	84.8	3.4	3.5	4.2				
						24.4	27.5	6.0	6.0	83.5	3.7	3.7	4.8				
						24.4	27.4	6.0	6.0	82.9	3.7	4.6	4.7				
23/11/12	1414-1432	22/Cloudy	Small Wave	18.6	Surface	24.1	27.3	6.4	6.3	88.6	3.5	3.4	4.2	4.5			
						24.2	27.3	6.3	6.3	88.1	3.4	4.4					
						24.2	27.4	6.2	6.2	86.7	3.5	3.6	4.6				
						24.2	27.4	6.2	6.2	86.1	3.5	3.6	4.6				
						24.2	27.5	6.1	6.0	84.4	3.8	3.8	4.6				
						24.3	27.4	6.0	6.0	83.9	3.8	4.8	4.7				
26/11/12	1014-1032	19/Cloudy	Small Wave	17.4	Surface	23.8	27.4	6.3	6.3	88.3	3.4	3.4	4.2	4.5			
						23.9	27.4	6.2	6.2	87.7	3.5	4.2					
						23.9	27.5	6.2	6.2	86.3	3.5	4.4					
						23.9	27.5	6.2	6.2	85.7	3.5	4.6					
						23.9	27.5	6.0	6.0	84.1	3.7	4.6					
						24.0	27.5	6.0	6.0	83.5	3.8	4.8					
28/11/12	1715-1732	20/Cloudy	Great Wave	18.0	Surface	23.0	27.3	6.3	6.3	86.8	3.3	3.4	4.2	4.5			
						23.0	27.4	6.2	6.2	85.7	3.4	4.4					
						23.0	27.4	6.2	6.2	85.3	3.6	4.6					
						22.9	27.3	6.2	6.2	85.6	3.6	4.6					
						22.9	27.5	5.9	5.9	81.9	3.7	4.8					
						22.8	27.4	5.9	5.9	81.7	3.7	4.6					
30/11/12	1649-1706	21/Drizzle	Small Wave	18.0	Surface	23.2	27.1	6.4	6.4	86.3	3.2	3.2	4.0	4.3			
						23.3	27.0	6.4	6.4	88.9	3.2	3.8					
						23.3	27.2	6.2	6.2	86.1	3.4	4.2					
						23.4	27.3	6.2	6.2	85.7	3.4	4.4					
						23.5	27.5	6.1	6.1	84.4	3.6	4.6					
						23.6	27.4	6.1	6.1	83.8	3.6	4.8					



# Mid-Ebb Tide

Monitoring Station : M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)		Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
02/11/12	1309-1326	22/Fine	Small Wave	12.1	Surface	25.4	26.3	5.8	5.8	84.5	84.3	3.6	4.6	3.6	4.6	4.7	
						25.4	26.3	5.8	5.8	84.1	84.3	3.6	4.8				
						25.3	26.5	5.7	5.7	83.2	83.0	3.7	4.8				
					Middle	25.3	26.5	5.7	5.7	82.7	83.0	3.8	4.6	3.8	4.6		
						25.2	26.7	5.7	5.7	82.4	82.3	4.0	5.0				
						25.2	26.8	5.7	5.7	82.1	82.3	4.0	5.2				
05/11/12	1610-1626	25/Fine	Small Wave	12.2	Surface	25.3	26.3	5.9	5.9	82.9	82.6	3.7	4.8	3.6	4.8		
						25.4	26.4	5.8	5.8	82.3	82.6	3.6	4.6				
						25.2	26.5	5.8	5.8	81.6	81.2	3.8	4.6				
					Middle	25.2	26.5	5.7	5.7	80.8	81.2	3.7	4.6	3.7	4.6		
						25.2	26.5	5.7	5.7	80.4	80.2	3.8	4.8				
						25.1	26.8	5.7	5.7	79.9	80.2	3.9	5.2				
07/11/12	1808-1826	24/Fine	Small Wave	11.8	Surface	25.5	26.3	5.9	5.9	83.6	83.4	3.6	4.4	3.6	4.4		
						25.5	26.3	5.9	5.9	83.2	83.4	3.7	4.6				
						25.3	26.5	5.9	5.8	82.5	82.4	3.9	4.8				
					Middle	25.3	26.6	5.8	5.8	82.2	82.4	3.8	4.8	3.8	4.8		
						25.2	26.7	5.7	5.7	80.7	80.6	3.9	5.0				
						25.2	26.7	5.7	5.7	80.4	80.6	3.9	5.2				
09/11/12	0834-0850	24/Fine	Small Wave	11.8	Surface	25.2	26.3	5.9	5.9	83.3	83.1	3.4	4.4	3.4	4.4		
						25.2	26.4	5.9	5.9	82.8	83.1	3.4	4.6				
						25.1	26.6	5.9	5.8	82.2	82.0	3.6	4.4				
					Middle	25.1	26.6	5.8	5.8	81.7	82.0	3.6	4.4	3.6	4.4		
						25.0	26.8	5.7	5.7	80.3	80.4	3.8	4.8				
						25.0	26.8	5.7	5.7	80.5	80.4	3.8	5.2				
12/11/12	1039-1054	23/Fine	Small Wave	11.6	Surface	24.3	26.2	6.0	5.9	83.1	82.9	3.4	4.6	3.4	4.4		
						24.3	26.3	5.9	5.9	82.7	82.9	3.4	4.2				
						24.3	26.3	5.9	5.9	82.0	81.7	3.5	4.4				
					Middle	24.2	26.4	5.8	5.8	81.4	81.7	3.6	4.6	3.6	4.5		
						24.2	26.4	5.7	5.7	79.8	79.6	3.7	4.8				
						24.1	26.5	5.7	5.7	79.3	79.6	3.7	5.2				
14/11/12	1210-1226	25/Cloudy	Small Wave	11.4	Surface	24.8	26.7	5.9	5.9	82.9	82.8	3.5	4.6	3.5	4.5		
						24.8	26.8	5.9	5.9	82.7	82.8	3.5	4.4				
						24.8	26.8	5.8	5.8	81.6	81.4	3.6	4.4				
					Middle	24.9	26.8	5.8	5.8	81.2	81.4	3.6	4.8	3.6	4.6		
						24.9	26.9	5.7	5.7	79.8	79.7	3.7	4.6				
						24.9	26.9	5.7	5.7	79.5	79.7	3.7	4.8				
16/11/12	1351-1404	25/Cloudy	Great Wave	12.8	Surface	24.2	27.3	6.5	6.5	91.1	90.7	3.6	4.4	3.6	4.5		
						24.3	27.4	6.5	6.5	90.3	90.7	3.7	4.6				
						24.2	27.3	6.7	6.7	93.0	93.2	3.7	4.8				
					Middle	24.2	27.4	6.7	6.7	93.4	93.4	3.8	4.8	3.8	4.8		
						24.2	27.4	6.7	6.7	93.1	93.0	3.9	5.0				
						24.2	27.4	6.7	6.7	92.9	93.0	3.9	5.2				
19/11/12	1637-1652	23/Cloudy	Small Wave	12.6	Surface	24.4	27.2	6.5	6.4	89.9	89.6	3.6	4.2	3.6	4.3		
						24.3	27.1	6.4	6.4	89.3	89.6	3.7	4.4				
						24.4	27.3	6.4	6.4	88.9	88.6	3.8	4.8				
					Middle	24.4	27.3	6.3	6.4	88.3	88.6	3.8	5.0	3.8	4.9		
						24.4	27.3	6.2	6.2	86.8	86.5	3.9	4.8				
						24.5	27.4	6.2	6.2	86.2	86.5	3.9	5.2				

**Mid-Ebb Tide**

Monitoring Station : M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)		Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)		Turbidity (NTU)			Suspended Solids (mg/L)			
					Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Depth-average	Value	Average	
21/11/12	1837-1852	23/Drizzle	Small Wave	12.8	Surface	1.0	24.1	27.3	6.3	27.4	87.1	86.9	3.5	4.2	3.5	4.3		
							24.0	27.4	6.2	86.7	3.5	4.4						
							24.1	27.4	6.2	85.9	3.4	4.6						
					Middle	6.4	24.2	27.4	6.2	27.4	85.7	85.8	3.4	3.5			3.4	4.5
							24.2	27.4	6.2	84.6	3.4	4.4						
							24.2	27.4	6.0	83.8	3.6	4.4						
Bottom	11.8	24.3	27.5	6.0	27.5	84.1	84.0	3.6	3.6	3.6	4.6							
		24.3	27.5	6.0	83.6	3.6	4.8											
		24.1	27.4	6.2	86.6	3.5	4.5											
23/11/12	0837-0852	24/Rainy	Great Wave	12.4	Surface	1.0	24.2	27.4	6.2	27.4	85.9	86.3	3.5	4.2	3.5	4.4		
							24.2	27.4	6.1	85.0	3.4	4.6						
							24.2	27.4	6.1	84.6	3.4	4.4						
					Middle	6.2	24.2	27.4	6.1	27.4	83.8	84.8	3.4	3.4			3.4	4.5
							24.2	27.4	6.0	83.6	3.6	4.8						
							24.2	27.5	6.0	83.7	3.6	5.0						
Bottom	11.4	24.3	27.5	6.0	27.5	83.6	83.7	3.6	3.6	3.6	5.2							
		23.9	27.4	6.3	27.4	87.7	88.1	3.3	4.2									
		23.9	27.4	6.4	88.5	3.3	4.2											
26/11/12	1612-1628	19/Cloudy	Great Wave	12.6	Surface	1.0	23.9	27.4	6.3	27.4	87.3	86.9	3.4	4.4	3.4	4.5		
							23.9	27.4	6.2	86.4	3.4	4.6						
							23.9	27.5	6.2	84.6	3.5	4.8						
					Middle	6.3	24.0	27.5	6.1	27.5	85.2	84.9	3.5	3.5			3.5	5.0
							24.0	27.5	6.1	86.0	3.3	4.2						
							23.0	27.2	6.2	85.4	3.4	4.4						
Bottom	11.6	22.9	27.3	6.1	27.3	84.4	84.3	3.4	3.4	3.4	4.5							
		22.9	27.3	6.1	84.1	3.5	4.6											
		22.9	27.3	5.9	81.8	3.7	4.6											
28/11/12	1210-1226	18/Cloudy	Great Wave	12.4	Surface	1.0	22.9	27.3	6.2	27.3	82.1	82.0	3.6	4.2	3.5	4.7		
							22.9	27.3	6.1	81.8	3.6	4.8						
							22.9	27.4	5.9	82.1	3.6	4.8						
					Middle	6.2	23.2	27.1	6.1	27.4	86.6	86.8	3.4	3.4			3.4	4.3
							23.2	27.1	6.3	87.0	3.4	4.4						
							23.3	27.2	6.2	85.5	3.5	4.4						
Bottom	11.4	23.3	27.2	6.1	27.2	84.9	85.2	3.5	3.5	3.5	4.5							
		23.4	27.3	6.1	83.9	3.6	4.6											
		23.5	27.4	6.0	83.4	3.6	4.8											
30/11/12	1315-1332	25/Drizzle	Small Wave	12.4	Surface	1.0	23.2	27.1	6.3	27.1	86.6	86.8	3.4	4.2	3.5	4.5		
							23.2	27.0	6.3	87.0	3.4	4.4						
							23.3	27.2	6.2	85.5	3.5	4.4						
					Middle	6.2	23.3	27.2	6.1	27.2	84.9	85.2	3.5	3.5			3.5	4.5
							23.4	27.3	6.1	83.9	3.6	4.6						
							23.4	27.3	6.1	83.9	3.6	4.8						
Bottom	11.4	23.5	27.4	6.0	27.4	83.4	83.7	3.6	3.6	3.6	4.8							
		23.5	27.4	6.0	83.4	3.6	4.8											
		23.5	27.4	6.0	83.4	3.6	4.8											

## Mid-Flood Tide

Monitoring Station : M/5

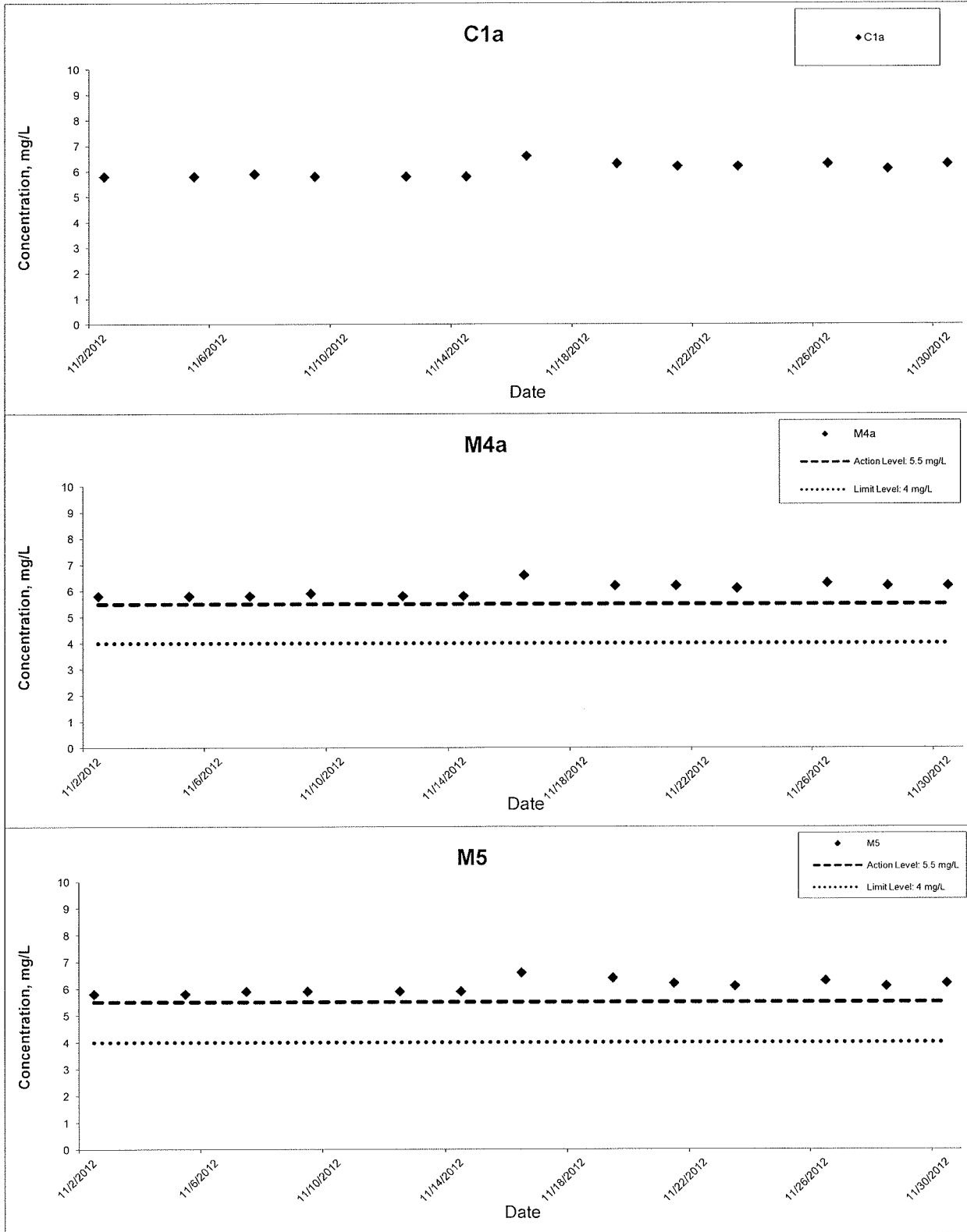
Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
							Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
02/11/12	1808-1825	25/Fine	Small Wave	12.6	Surface	25.5	26.3	5.9	85.8	3.6	4.4	3.6	4.4	4.3			
					Middle	25.3	26.5	5.8	84.5	3.7	4.6	3.7	4.7				
					Bottom	25.2	26.7	5.7	83.4	3.9	5.0	3.9	5.1				
05/11/12	1135-1153	24/Fine	Small Wave	12.8	Surface	25.3	26.3	5.9	83.8	3.6	4.2	3.6	4.3				
					Middle	25.2	26.4	5.8	82.8	3.7	4.6	3.7	4.6				
					Bottom	25.1	26.5	5.9	82.8	3.6	4.6	3.6	4.6				
07/11/12	1310-1326	23/Fine	Small Wave	12.2	Surface	25.1	26.8	5.7	80.8	3.9	4.8	3.9	4.9				
					Middle	25.0	26.8	5.8	81.2	3.9	5.0	3.9	5.0				
					Bottom	25.2	26.4	5.9	83.5	3.6	4.4	3.6	4.5				
09/11/12	1438-1452	26/Fine	Small Wave	12.0	Surface	25.1	26.5	5.8	81.9	3.6	4.8	3.6	4.6				
					Middle	25.1	26.6	5.8	81.5	3.6	4.4	3.6	4.4				
					Bottom	25.0	26.7	5.7	81.1	3.9	4.8	3.9	4.9				
12/11/12	1638-1652	25/Fine	Small Wave	12.4	Surface	25.3	26.3	6.0	84.5	3.3	4.2	3.3	4.1				
					Middle	25.2	26.5	5.9	83.2	3.3	4.4	3.3	4.3				
					Bottom	25.2	26.6	5.9	82.8	3.4	4.2	3.4	4.3				
14/11/12	1703-1719	26/Fine	Small Wave	19.2	Surface	24.7	26.8	5.9	82.2	3.4	4.6	3.4	4.4				
					Middle	24.8	26.9	5.8	81.1	3.6	4.6	3.6	4.6				
					Bottom	24.9	27.0	5.8	80.5	3.7	4.4	3.7	4.5				
16/11/12	0840-0855	23/Cloudy	Small Wave	13.0	Surface	24.2	27.2	6.4	89.4	3.6	4.2	3.6	4.3				
					Middle	24.3	27.2	6.4	88.6	3.7	4.6	3.7	4.7				
					Bottom	24.4	27.4	6.1	85.5	3.9	5.0	3.9	5.0				
19/11/12	1145-1200	22/Cloudy	Small Wave	13.4	Surface	24.1	27.4	6.3	87.8	3.5	4.2	3.5	4.2				
					Middle	24.2	27.4	6.2	86.2	3.3	4.6	3.3	4.5				
					Bottom	24.3	27.5	6.0	83.8	3.5	4.6	3.5	4.7				

## Mid-Flood Tide

Monitoring Station : M5

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Sea Condition	Total Water Depth (m)	Monitoring Depth (m)	Water Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Turbidity (NTU)		Suspended Solids (mg/L)	
							Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
21/11/12	1312-1328	24/Cloudy	Small Wave	13.4	Surface	24.2	27.3	27.3	6.3	87.8	3.5	4.2	3.5	4.3	
						24.2	27.3	6.3	87.5	3.4	4.4				
						24.2	27.4	6.2	86.1	3.4	4.4				
					Middle	24.3	27.3	6.2	86.6	3.3	4.0	3.4	4.2		
						24.3	27.4	6.0	84.1	3.5	4.6				
						24.4	27.5	6.1	84.5	3.5	4.8				
23/11/12	1438-1453	22/Cloudy	Small Wave	12.8	Surface	24.1	27.4	27.4	6.3	87.5	3.4	4.2	3.4	4.3	
						24.1	27.3	6.3	88.2	3.4	4.4				
						24.1	27.4	6.2	86.9	3.5	4.6				
					Middle	24.2	27.4	6.2	86.2	3.5	4.8	3.5	4.7		
						24.2	27.4	6.1	84.3	3.6	4.6				
						24.2	27.5	6.1	84.8	3.5	4.6				
26/11/12	1038-1053	19/Cloudy	Small Wave	12.2	Surface	23.9	27.4	27.4	6.3	87.1	3.4	4.2	3.4	4.3	
						23.8	27.3	6.3	87.8	3.3	4.4				
						23.9	27.4	6.2	86.6	3.4	4.6				
					Middle	24.0	27.4	6.2	85.9	3.5	4.6	3.4	4.6		
						24.0	27.4	6.0	83.9	3.5	4.8				
						24.0	27.5	6.1	84.5	3.5	5.0				
28/11/12	1740-1757	20/Cloudy	Great Wave	13.0	Surface	23.0	27.3	27.3	6.2	86.1	3.2	4.0	3.2	4.1	
						23.0	27.3	6.2	85.6	3.2	4.2				
						23.0	27.4	6.0	83.2	3.4	4.4				
					Middle	22.9	27.3	6.1	83.8	3.4	4.4	3.4	4.4		
						22.9	27.4	6.0	82.5	3.5	4.6				
						22.9	27.4	5.9	81.7	3.6	4.8				
30/11/12	1713-1728	21/Drizzle	Small Wave	12.8	Surface	23.3	27.1	27.1	6.4	88.6	3.2	4.0	3.2	4.1	
						23.2	27.1	6.4	89.3	3.3	4.2				
						23.2	27.1	6.3	86.6	3.4	4.2				
					Middle	23.3	27.2	6.2	85.9	3.3	4.4	3.4	4.3		
						23.3	27.2	6.1	84.8	3.5	4.4				
						23.4	27.3	6.1	85.1	3.5	4.4				
Bottom	23.4	27.3	6.2	85.4	3.5	4.6	3.5	4.5							

### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



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 Monitoring Results

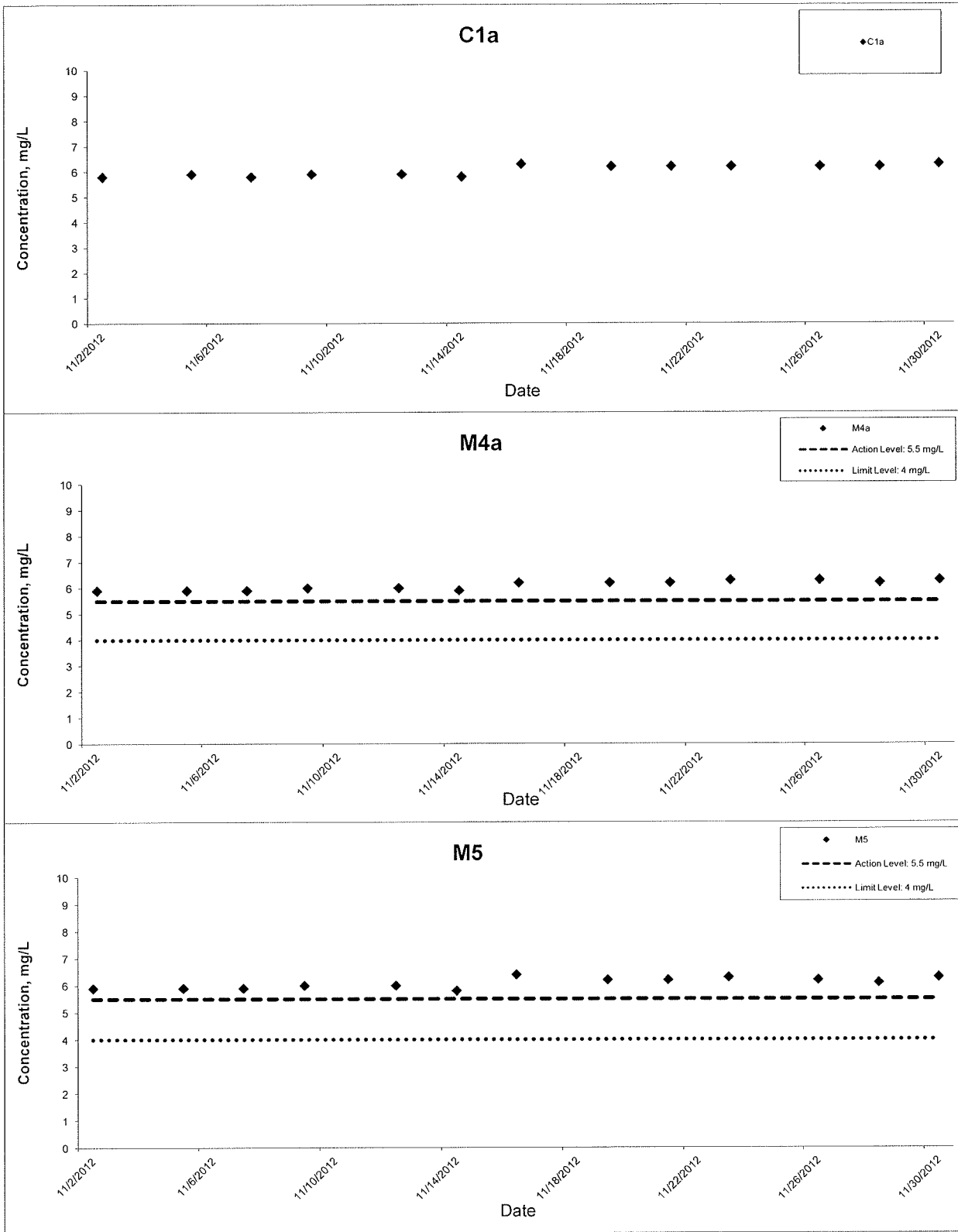


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## Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



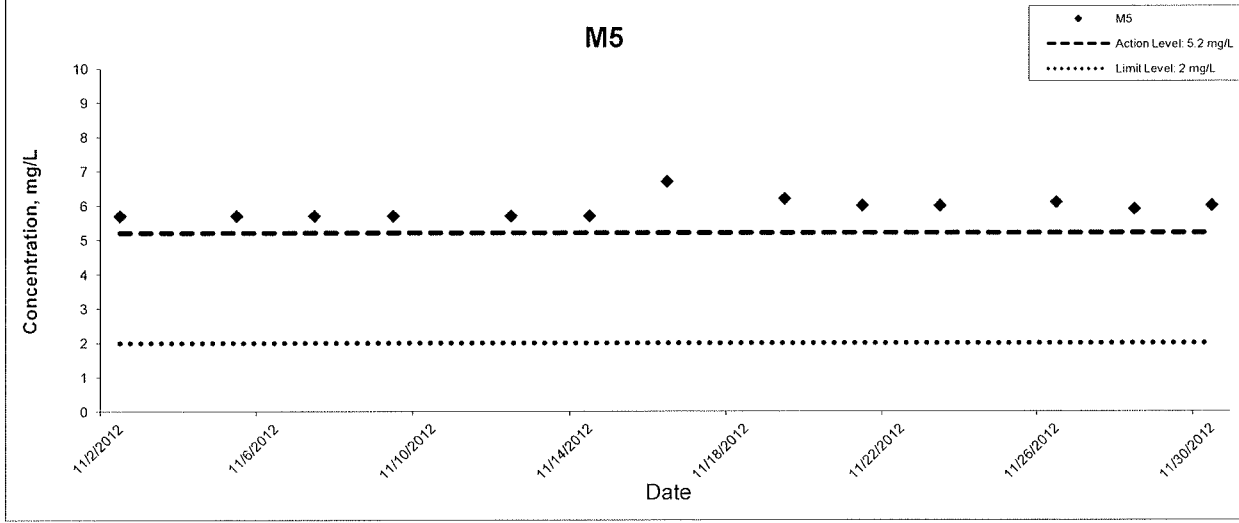
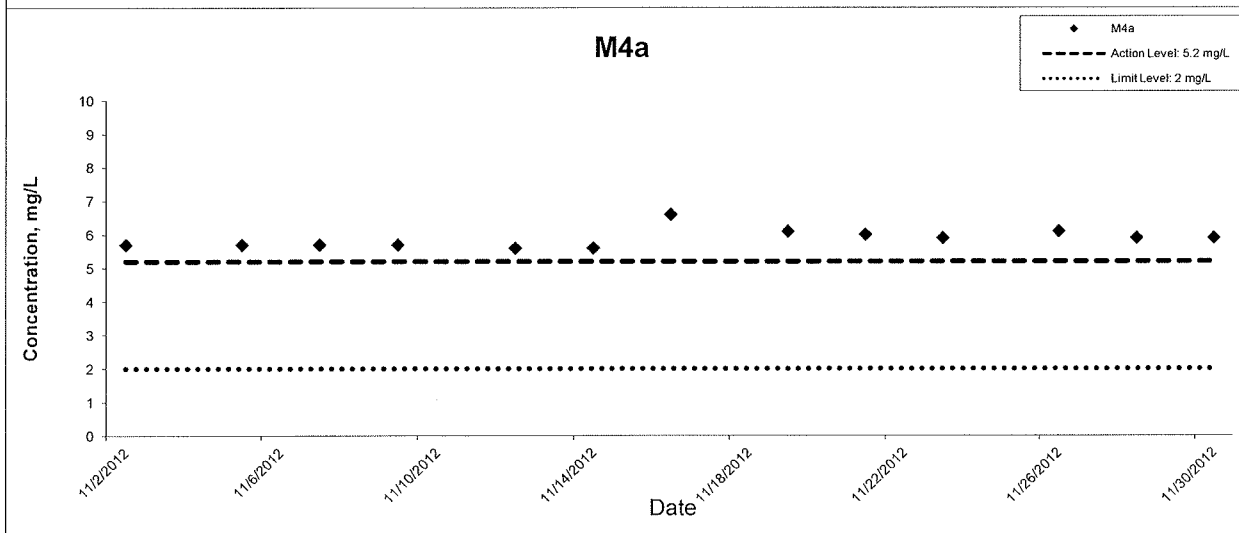
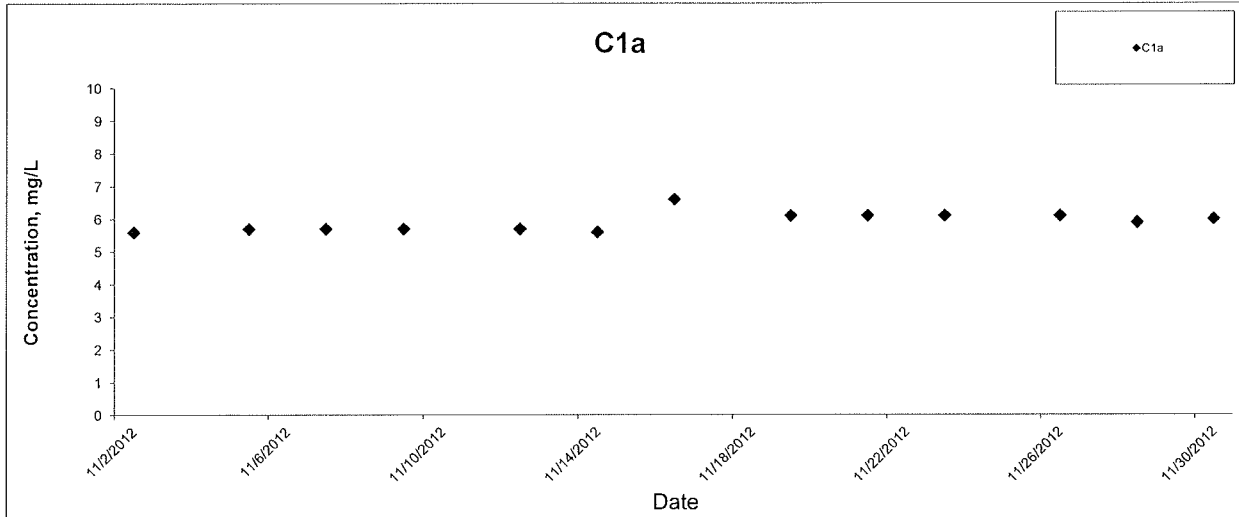
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### Dissolved Oxygen (Bottom) at Mid-Ebb Tide



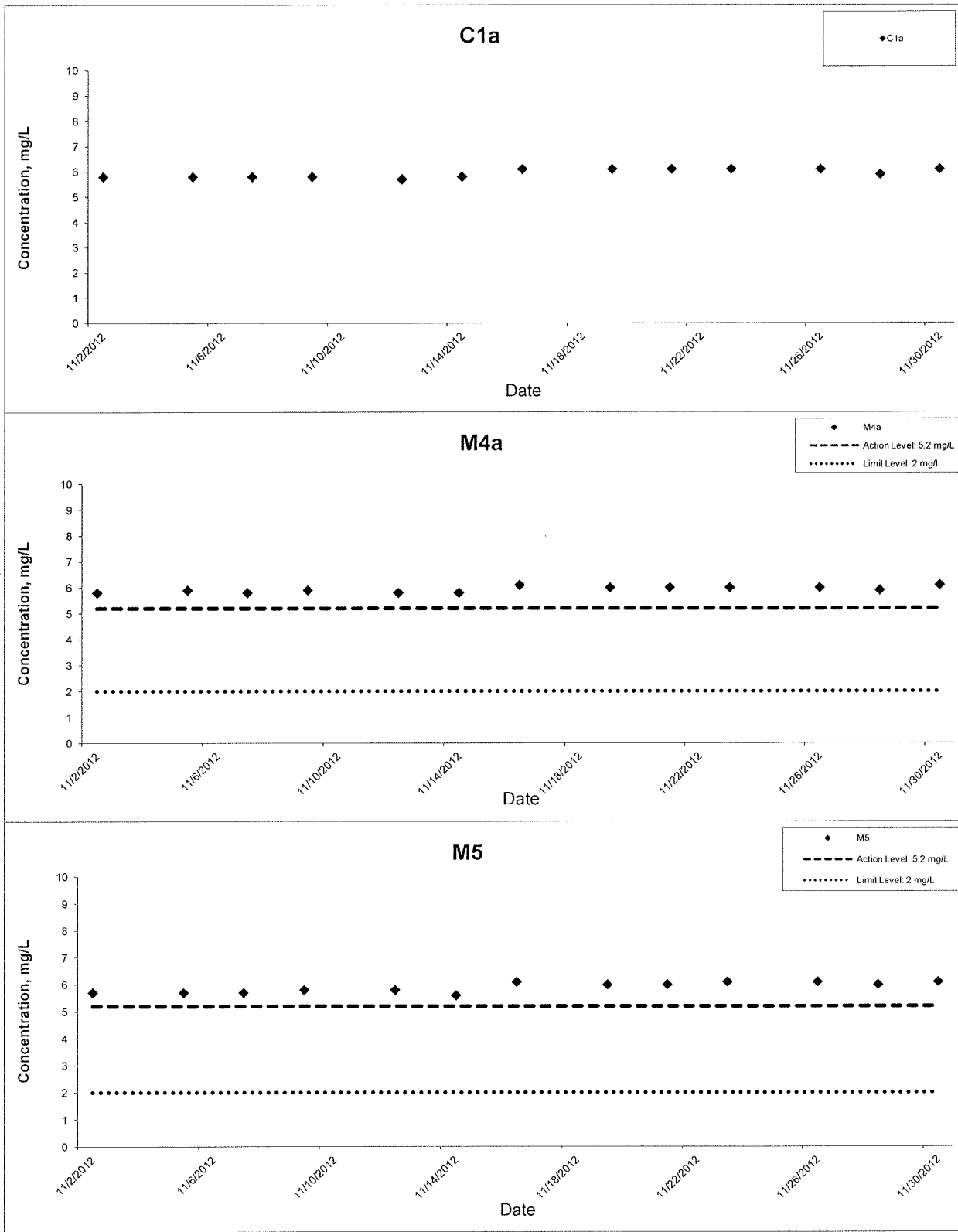
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### Dissolved Oxygen (Bottom) at Mid-Flood Tide



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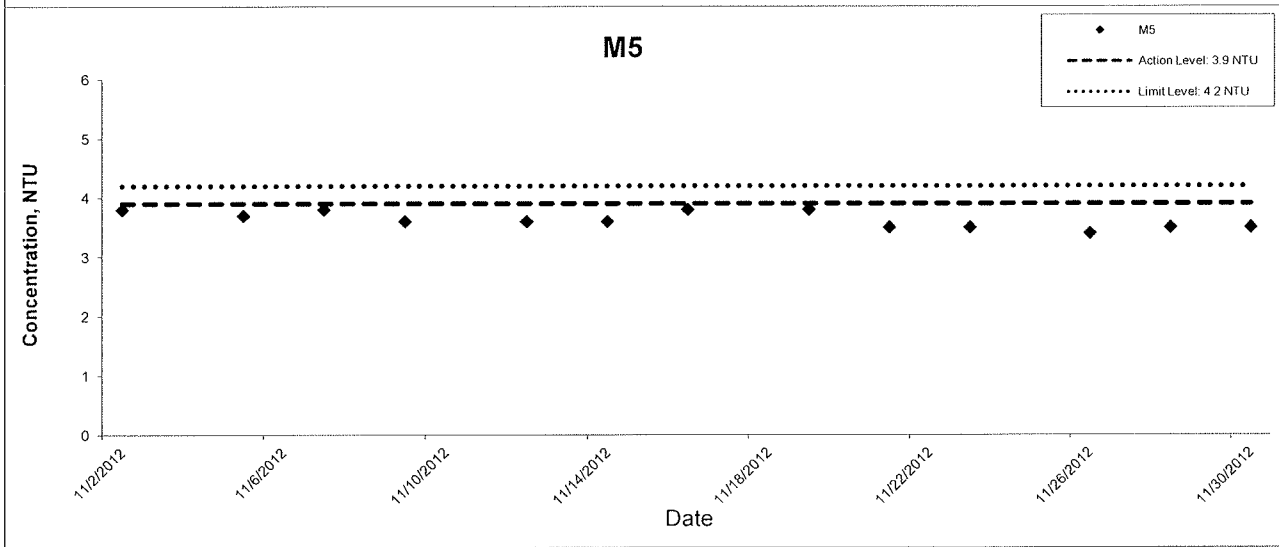
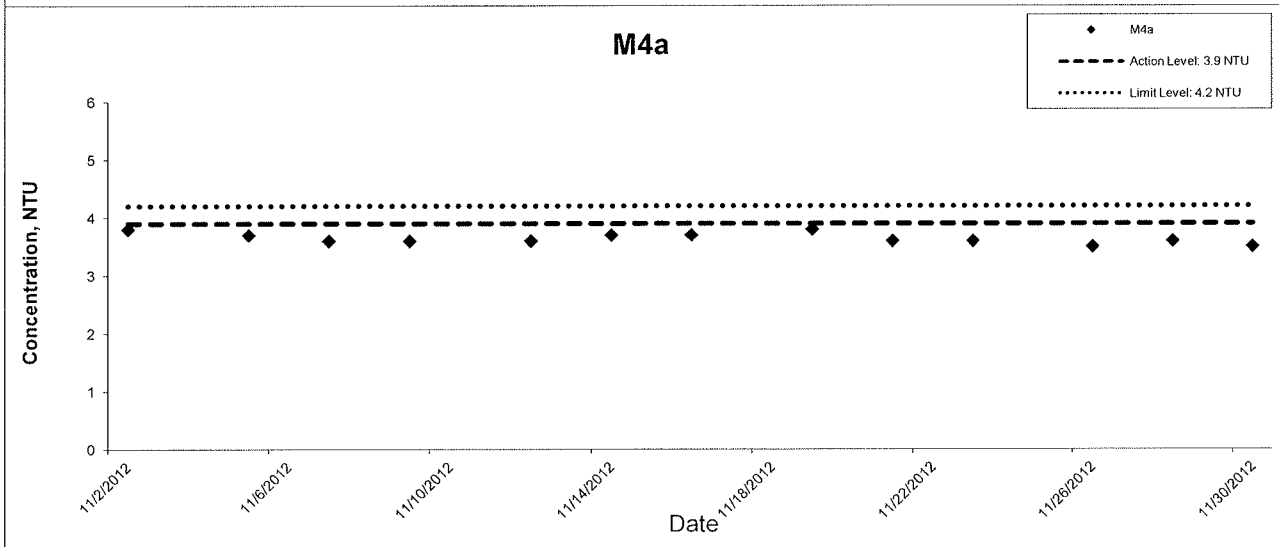
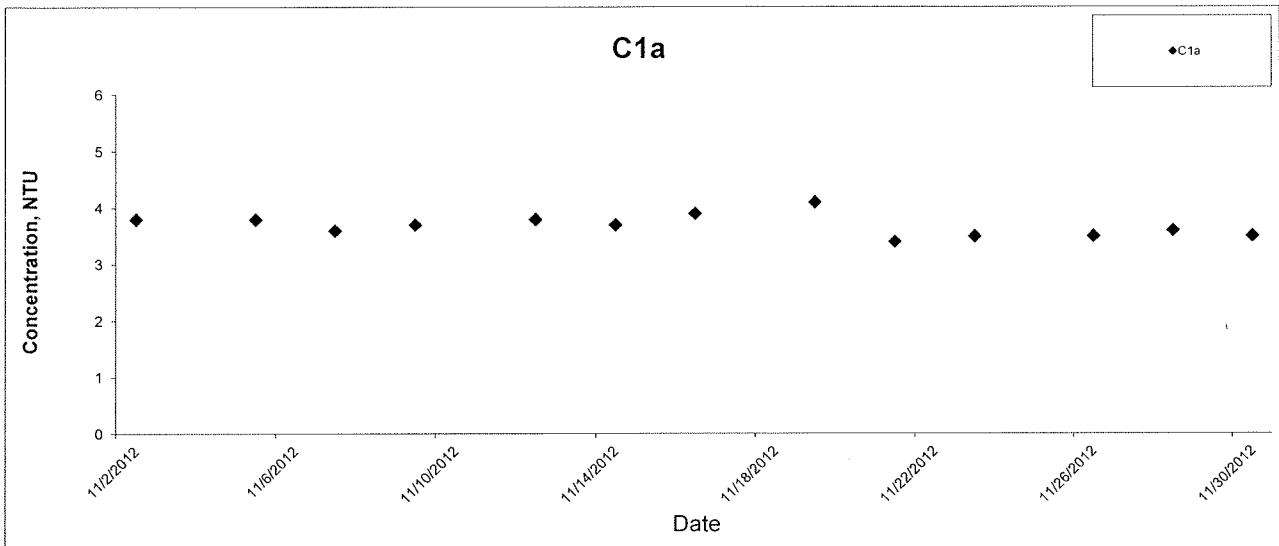
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### Turbidity at Mid-Ebb Tide



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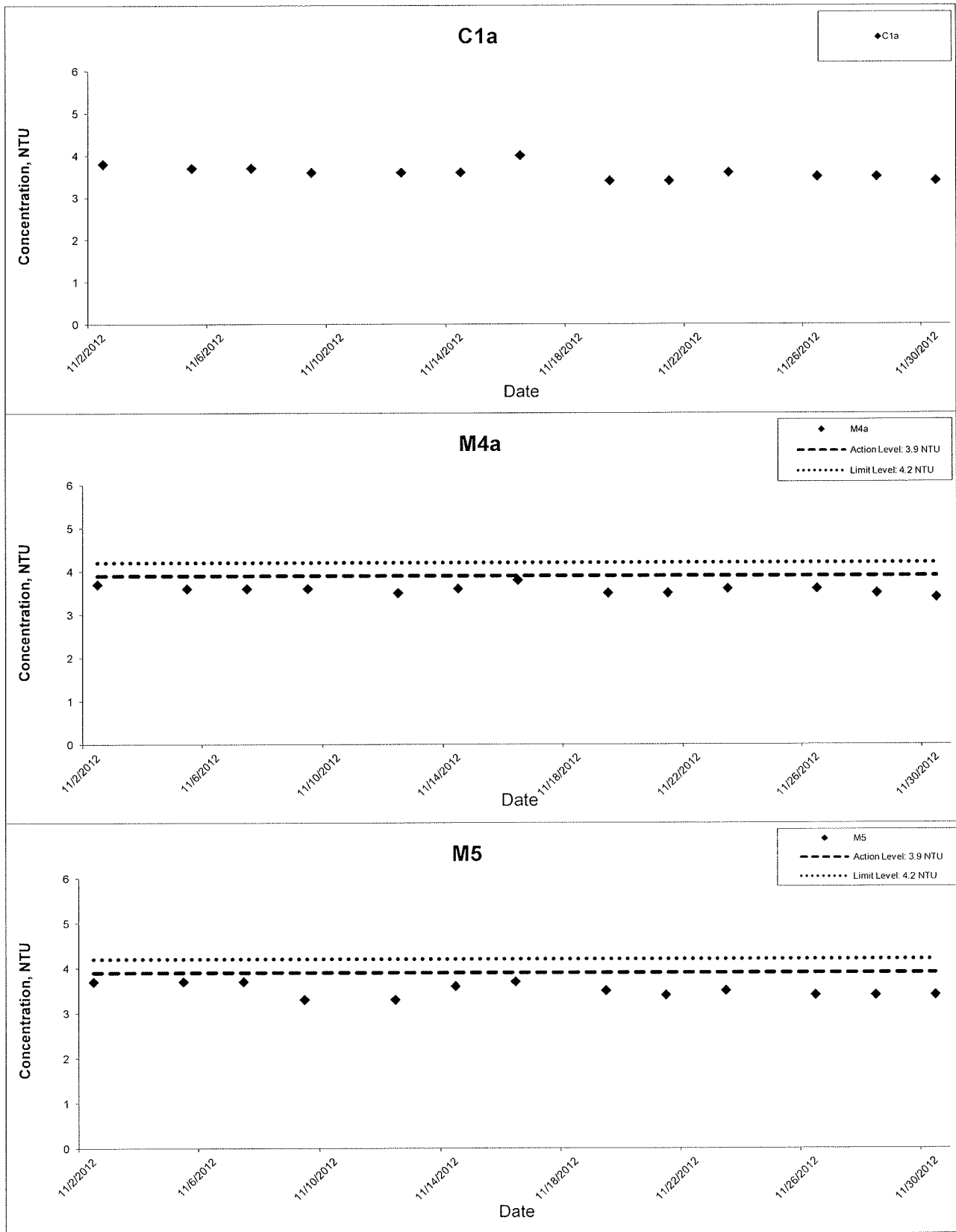


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### Turbidity at Mid-Flood Tide



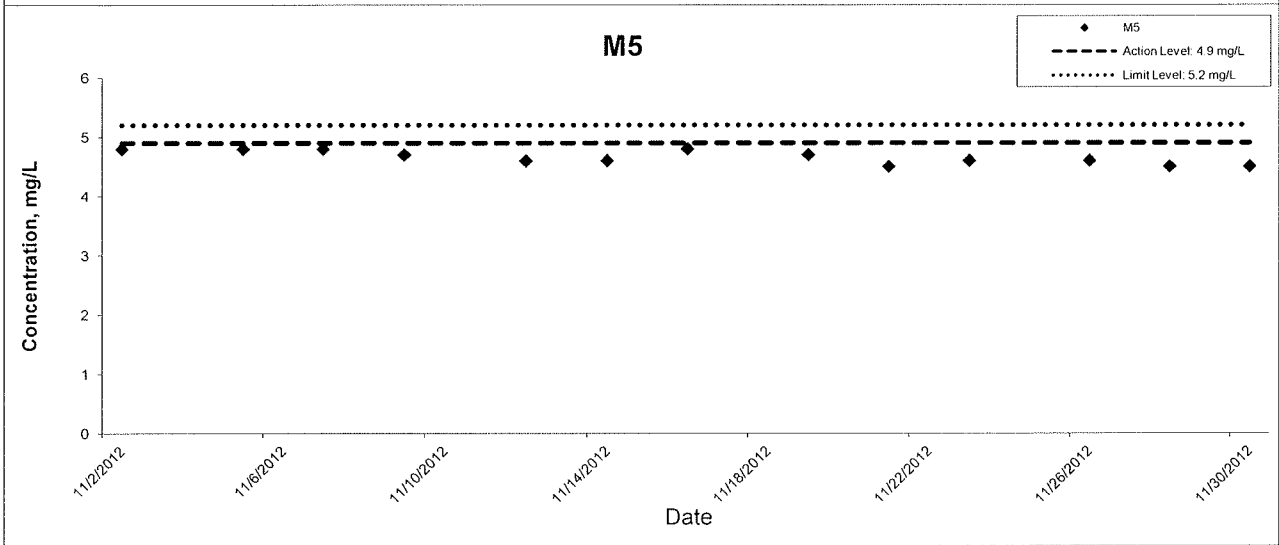
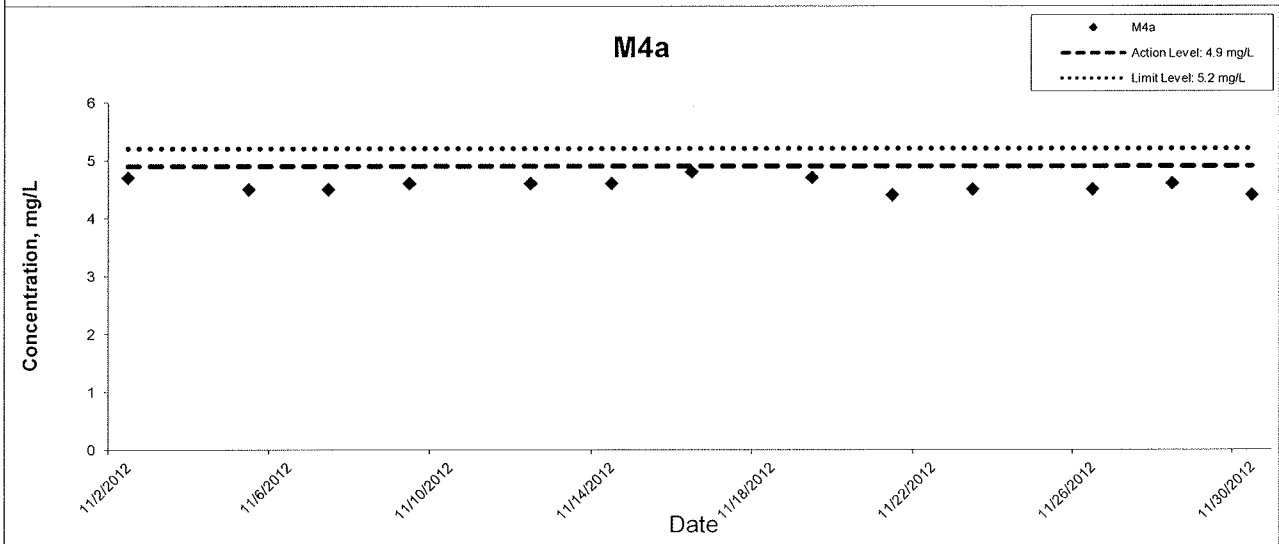
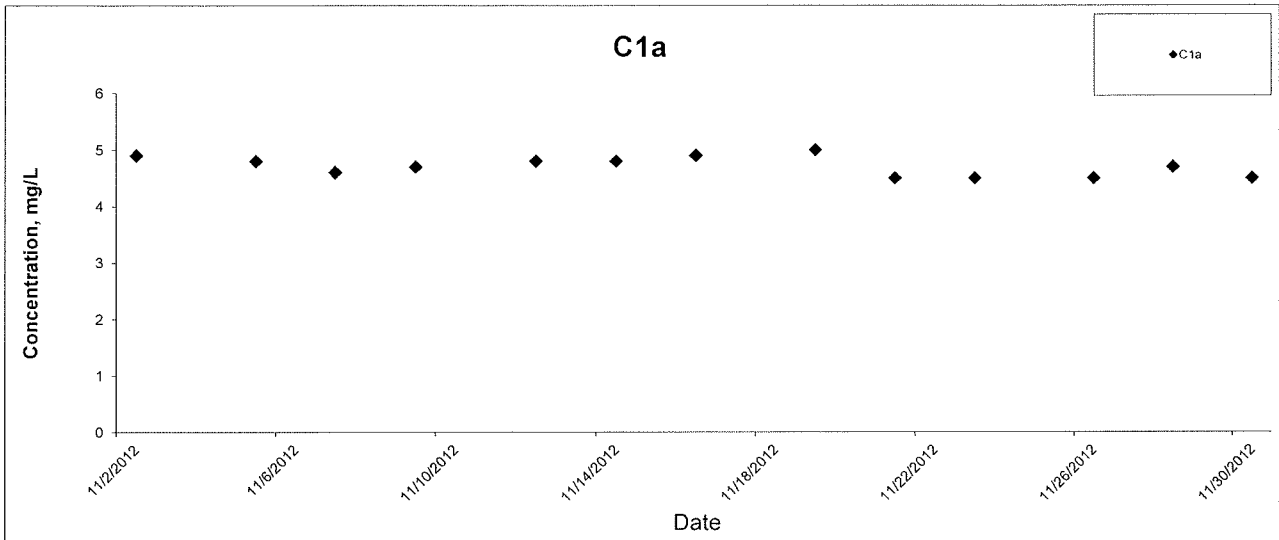
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### Suspended Solids at Mid-Ebb Tide



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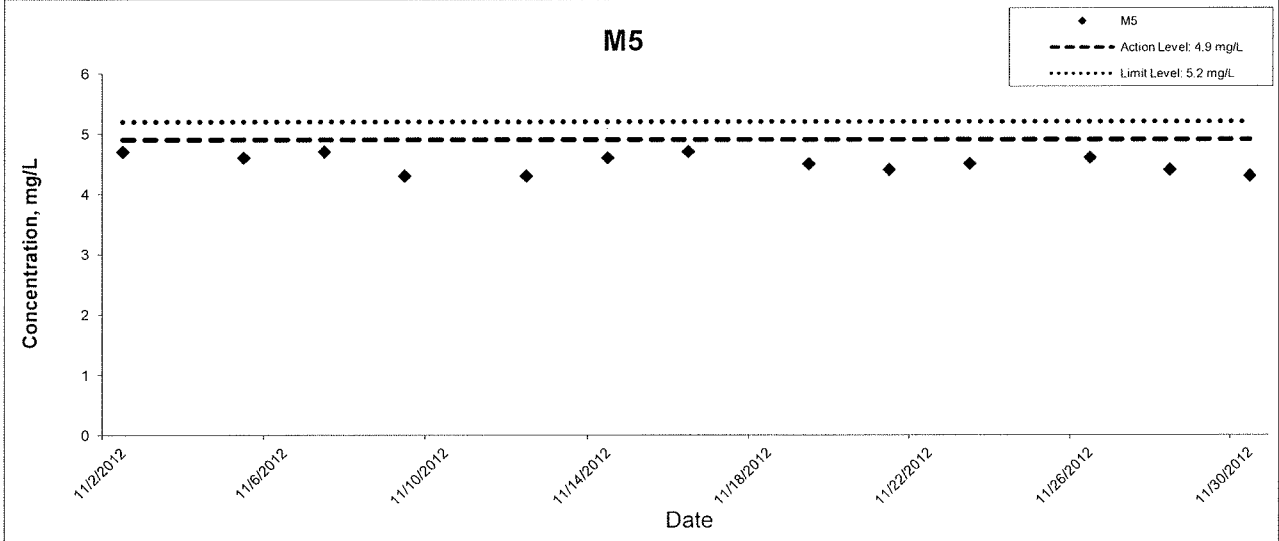
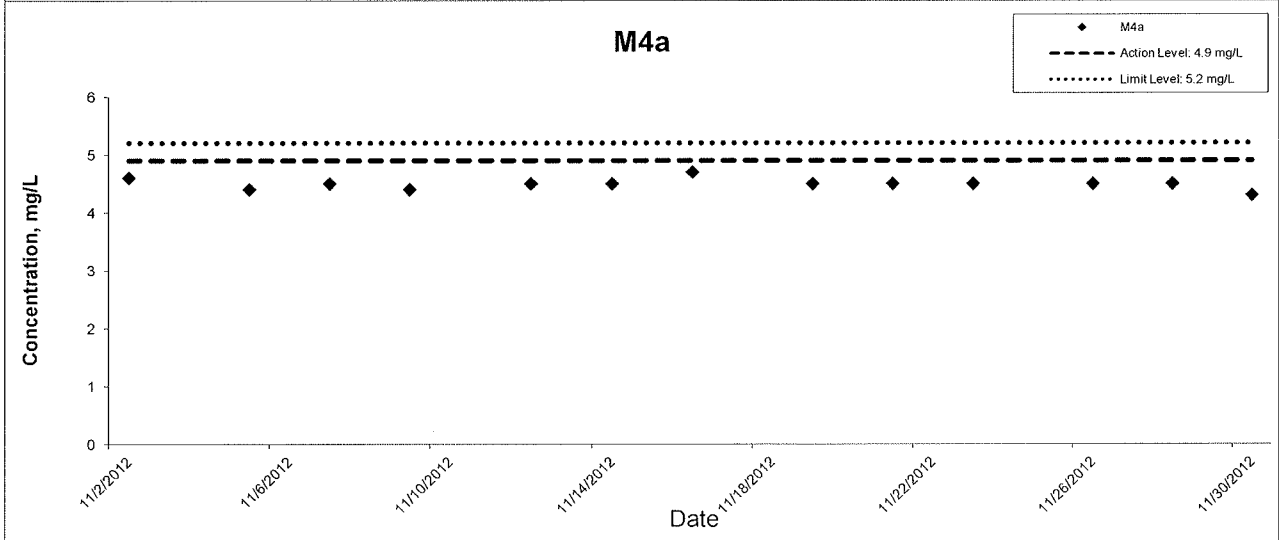
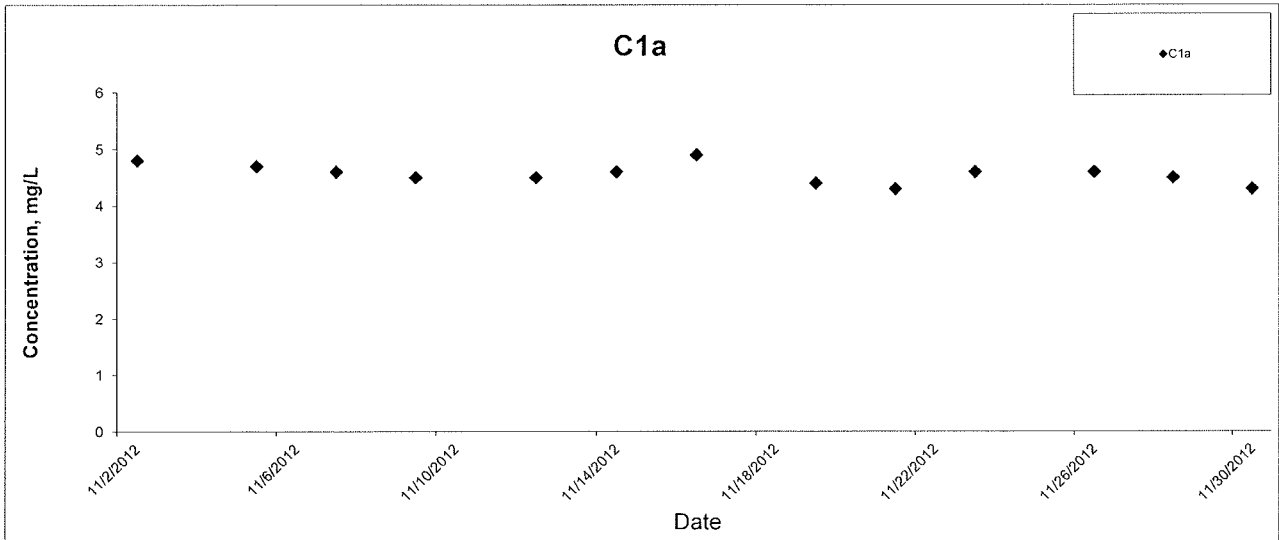


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### Suspended Solids at Mid-Flood Tide



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**APPENDIX D  
QA/QC REPORT**

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## QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
02/11/2012	98.4	FC1a-S1	0.0	EC1a-S2	103.8
	98.2	EC1a-M1	8.0	EWM5-B2	102.1

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
05/11/2012	99.6	FC1a-S1	8.7	EC1a-S2	105.9
	107.4	EC1a-M1	8.0	EWM5-B2	93.9

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
07/11/2012	94.9	FC1a-S1	8.7	EC1a-S2	97.9
	101.2	EC1a-M1	0.0	EWM5-B2	93.9

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
09/11/2012	102.5	FC1a-S1	0.0	EC1a-S2	100.0
	99.0	EC1a-M1	0.0	EWM5-B2	100.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
12/11/2012	106.2	FC1a-S1	0.0	EC1a-S2	100.0
	96.0	EC1a-M1	8.0	EWM5-B2	94.1

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
14/11/2012	104.5	FC1a-S1	0.0	EC1a-S2	95.9
	93.9	EC1a-M1	8.0	EWM5-B2	107.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
16/11/2012	99.0	FC1a-S1	8.0	EC1a-S2	103.9
	107.9	EC1a-M1	0.0	EWM5-B2	106.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
19/11/2012	97.4	FC1a-S1	0.0	EC1a-S2	102.0
	94.5	EC1a-M1	0.0	EWM5-B2	98.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
21/11/2012	97.6	FC1a-S1	0.0	EC1a-S2	92.3
	99.8	EC1a-M1	8.7	EWM5-B2	95.9

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
23/11/2012	107.6	FC1a-S1	8.7	EC1a-S2	98.0
	97.6	EC1a-M1	0.0	EWM5-B2	94.0

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
26/11/2012	92.3	FC1a-S1	8.7	EC1a-S2	96.0
	93.8	EC1a-M1	0.0	EWM5-B2	105.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
28/11/2012	98.4	FC1a-S1	0.0	EC1a-S2	103.8
	98.8	EC1a-M1	0.0	EWM5-B2	107.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.

Sampling Date	QC Sample	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
30/11/2012	98.6	FC1a-S1	0.0	EC1a-S2	92.3
	96.5	EC1a-M1	8.7	EWM5-B2	91.8

Note: (\*) % Recovery of QC sample should be between 80% to 120%.  
 (#) % Error of Sample Duplicate should be between 0% to 10%.  
 (@) % Recovery of Sample Spike should be between 80% to 120%.  
 (\*\*) % Error of Sample Duplicate >10% but invalid due to sample results less than PQL.