

## **China Harbour – Zhen Hua Joint Venture**


**Contract No.: CV/2015/07  
Handling of Surplus Public Fill  
(2016-2018)**

**TSEUNG KWAN O AREA 137 FILL BANK**

**MONTHLY EM&A REPORT NO.3**

**(JULY 2017)**

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5 September 2017

By Email and Fax No.: 2695 3944

ETS-Testconsult Limited  
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34-36 Au Pui Wan Street  
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Attention: Mr. C.L. Lau

Dear Mr. Lau,

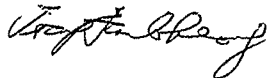
**Re: Contract No. CV/2015/07  
Handling of Surplus Public Fill (2016 – 2018)**

**Monthly EM&A Report (No. 3) for July 2017 for the Tseung  
Kwan O Area 137 Fill Bank**

Reference is made to your submission of the revised Monthly EM&A Report for July 2017 {Report No.: ENA74756A, dated 5 September 2017} for the TKO Area 137 Fill Bank, please note that we have no further comment on the revised monthly report.

Thank you for your attention. Please do not hesitate to contact our Jason Lai or the undersigned should you have any queries.

Yours sincerely,  
For and on behalf of  
Ramboll Environ Hong Kong Limited



F. C. Tsang  
Independent Environmental Checker

c.c. CEDD                      Attn: Mr. Simon Leung                      Fax No.: 2714 0113  
CHZHJV                      Attn: Mr. S W Sung                      By Email

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## **EXECUTIVE SUMMARY**

This monthly Environmental Monitoring and Audit (EM&A) report No.3 was prepared by ETS-Testconsult Ltd (ET) for the "Contract No: CV/2015/07 – Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank" (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at TKO Area 137 in July 2017.

### **Site Activities**

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

1. Operation of the TKO137 Fill Bank.
2. Transferring public fill to vessel and delivering to Taishan and other parties.

### **Environmental Monitoring Progress**

The summary of the monitoring activities in this monitoring period 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: 16 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 period.

### **Air Monitoring**

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

### **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 period.

### **Weekly Site Inspections**

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

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

No complaint, notification of summons or successful prosecutions with respect to environmental issues was received in this reporting period.

However, one complaint was received on 15 May 2017, which was forwarded to ET on 11 August 2017, from CEDD (Complaint NCF-N08/RE/00014875-17 Sent By CSO[RN]3 [CASE#2-3943858817 Int.Comm. - WS170513A57354] against illegal dumping at sea without permit in TKO137 fill bank.

### **Future Key Issues**

Based on site inspections and forecast of engineering works in 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;
- 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 – Zhen Hua Joint Venture (CHZH-JV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the “Contract No: CV/2015/07 – Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank” (The Project).

In accordance with the Environmental Permit (No.: EP-134/2002/K) (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 period 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 July 2017.

## 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 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 month 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

TKO Area 137 Fill Bank 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 G.

### 2.4 Project Organization and Management Structure

The project organization chart is shown in Appendix 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	Simon Leung, May Lau, James Sze, Phoebe Tang	Engineer's Representative	2762 5555	2714 0113
IEC (Ramboll Environ)	F C Tsang	IEC	3465 2888	3465 2899
Contractor (CHZH-JV)	Michael Cheung	Project Director	2887 8118	2512 0427
ET (ETL)	C. L. Lau	ET Leader	2946 7791	2695 3944

### 3.0 WORK PROGRESS IN THIS REPORTING PERIOD

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

1. Operation of the TKO137 Fill Bank
2. Transferring public fill to vessel and delivering to Taishan and other parties.

### 4.0 AIR QUALITY MONITORING

#### 4.1 Monitoring Requirement

TSP levels were monitored in the reporting period 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 B1.

Table 4.1 Air Quality Monitoring Equipment

Equipment	Model and Make
HVS	Greasby GMWS2310
Calibrator	Tisch TE-5025A

#### 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

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

#### 4.4 Monitoring Locations

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

Table 4.3 Air quality monitoring locations

Monitoring station	Location
TKO-A1	Site Egress
TKO-A2a	CREO

#### 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 (Whatman G653) 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 month 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°C ± 3°C and the relative humidity (RH) <50% ±5%.
- All measurement procedures in Section 2.3 of the EM&A Manual were followed during the reporting period.

##### 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 period are shown in Appendix 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-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 (August and September 2002 by Materialab) can also be valid in the case of TKO-A2a.

#### 4.7 Event-Action Plans

Please refer to Appendix 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 period are summarized in Appendix B2. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting period is shown in Appendix B3. Wind data included wind speed and wind direction was extracted from Tseung Kwan O Station of Hong Kong Observatory during this reporting period and is presented in Appendix E.

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

##### 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 bowzers and automatic water sprinklers on the main haul roads. Other dust sources near TKO Area 137 also included operation of the temporary CWSF 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 period 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 C1.

**Table 5.1 Noise Monitoring Equipment**

<i>Equipment</i>	<i>Model</i>
<i>Sound Level Meter</i>	<i>Rion NL-31 / Rion NL-52</i>
<i>Sound Level Calibrator</i>	<i>Rion NC-73 / Castle GA607</i>

### 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**

<i>Time</i>	<i>Duration/min</i>	<i>Parameters</i>	<i>Frequency</i>
<i>Day-time: 0700-1900 hrs on normal weekday</i>	<i>30</i>	<i>L<sub>eq</sub>, L<sub>10</sub>, L<sub>90</sub></i>	<i>Once per month</i>

### 5.4 Monitoring Locations

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

**Table 5.3 Noise Monitoring Location**

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

### 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 Leq, L10 and L90 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>Action</i>	<i>Limit</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 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 period. The detail of the noise monitoring is provided in Appendix C2. Graphical presentation of the monitoring result for the reporting period is shown in Appendix C3. Since no documented complaints on noise issue were received in this reporting period, no Action Level exceedance was recorded. Besides, no exceedance in Limit Level was 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.

## 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 period.

Table 6.1 Locations of Marine Water Monitoring Stations

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

### 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

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

#### 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
Temperature	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 2100Q) 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

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

### 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 2100Q) 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 D1.

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

Parameter	Model	Date of Calibration	Due Date	Equipment No.
Coordinate of Monitoring stations	Garmin eTrex 10	-----	-----	ET/EW/005/04
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI 85	19/04/17	18/07/17	ET/EW/008/001*
Dissolved Oxygen (Saturation), Temperature, Salinity	YSI Dissolved Oxygen, Salinity & Temperature Meter, YSI 2030	19/04/17	18/07/17	ET/EW/008/004*
		12/07/17	11/10/17	
		19/04/17	18/07/17	ET/EW/008/006*
		12/07/17	11/10/17	
		13/05/17	12/08/17	ET/EW/008/007*
Turbidity	HACH Model 2100Q Turbid Meter	22/05/17	21/08/17	ET/0505/014*
		17/06/17	16/09/17	ET/0505/015*
		10/06/17	09/09/17	ET/0505/016*
		24/06/17	23/09/17	ET/0505/020*
Water Depth	Speedtech SM-5	-----	-----	ET/EW/002/08

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 baseline data) or >120% of the upstream control station's turbidity at the same tide on the same day	>4.58 NTU (99%-ile of baseline 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 F for details.

## 6.8 Monitoring Duration in this reporting period

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

Table 6.7 Time Schedule of Impact Marine Water Quality Monitoring

July 2017						
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	31					
	▼					

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

(∇) = Marine water quality monitoring scheduled on 12 June 2017 was cancelled due to bad weather (Typhoon Signal No.3).

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

## 6.9 Marine Water Quality Monitoring Results

The impact water quality measurement results are detailed in Appendix D2. Appendix 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 period

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 period

## 7.0 ENVIRONMENTAL AUDIT

### 7.1 Weekly ET Site Inspections and EPD's Site Inspection

#### 7.1.1 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 period, four weekly site inspections were conducted (05, 12, 19 and 26 July 2017). Table 7.1 presents the key findings of weekly ET site inspection in this reporting period.

Table 7.1 Key Findings of Weekly ET Site Audits in this reporting period

Date	Key Findings	Action(s) Taken recommended by ET	Action(s) Taken by the Contractor during the ET weekly site audit	Rectification Status by ET
05 July 2017	Haul road near dry mud zone was found dry. (Previous item)	To watering the haul road to reduce dust generation.	Watering was note don the haul road near dry mud zone.	Closed
	Rubbish, such as plastic sheets, was discarded inside the drainage channel near CEDD site office. (New item)	To collect and dispose of the rubbish properly.	---	Follow-up
12 July 2017	Rubbish, such as plastic sheets, was discarded inside the drainage channel near CEDD site office. (Previous item)	To collect and dispose of the rubbish properly.	Rubbish, such as plastic sheets, discarded inside the drainage channel near CEDD site office was collected.	Closed
	Mud was accumulated inside the drainage channel near weighbridge. (New item)	To clear the accumulated mud properly to avoid any blockage.	---	Follow-up
19 July 2017	Mud was accumulated inside the drainage channel near weighbridge. (Previous item)	To clear the accumulated mud properly to avoid any blockage.	Mud accumulated inside the drainage channel near weighbridge was cleared.	Closed
	Silt curtain near tipping hall no.1 was noted damaged. (New item)	To repair the damaged part of silt curtain properly.	---	Follow-up
26 July 2017	Silt curtain near tipping hall no.1 was noted damaged. (Previous item)	To repair the damaged part of silt curtain properly.	Silt curtain near tipping hall no.1 was repaired.	Closed

#### 7.1.2 EPD's Site Inspection

No EPD's site inspection was carried out at TKO137 Fill Bank in July 2017.

### 7.2 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.

### **7.3 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 reporting period.

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

### **7.4 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 7.2 summarizes data on offsite waste disposal in this reporting period.

Table 7.2 Actual amounts of Waste generated in this reporting period

<i>Waste Type</i>	<i>Actual Amount</i>	<i>Disposal Locations</i>
<i>Public Fill (000m<sup>3</sup>)</i>	<i>0</i>	<i>TKO 137 Fill Bank</i>
<i>C&amp;D Waste (kg)</i>	<i>36.89</i>	<i>SENT Landfill / Refuse Collection Point</i>
<i>Chemical Waste (kg/L)</i>	<i>0</i>	<i>Collected by licensed collector</i>

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.

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 period 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/K	04/02/13	---	<ul style="list-style-type: none"> <li>▪ Site clearance</li> <li>▪ Construction of a temporary storm water system</li> <li>▪ Stockpiling of 6 million m<sup>3</sup> 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 month 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>
Marine Dumping Permit	EP/MD/18-021	08/07/17	30/09/17	<ul style="list-style-type: none"> <li>▪ Approval for dumping 3,000,000 tons (approximately equal to 1,666,667 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank and Tuen Mun Area 38 Fill Bank to designated dumping area at Guanghaiwan of Taishan</li> </ul>
Chemical Waste Producer	5919-839-C4181-01	19/04/17	---	<ul style="list-style-type: none"> <li>▪ Spent battery cell containing heavy metals and spent lubricating oil</li> </ul>
Billing Account for Waste Disposal	7027643	22/05/17	---	---
Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust)	415682	12/04/17	---	---
Discharge License	Applied on 23 May 2017			

## 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 period.

Since no documented complaints on noise issue were received in this reporting period, 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 period.

### 9.2 Summary of Environmental Complaints

No complaint was received in this reporting period.

### 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 period.

## 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. 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 quality, noise and marine water monitoring results was recorded for this reporting period, 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 period.

However, One complaint was received on 15 May 2017, which was forwarded to ET on 11 August 2017, from CEDD (Complaint NCF-N08/RE/00014875-17 Sent By CSO[RN]3 [CASE#2-3943858817 Int.Comm. - WS170513A57354] against illegal dumping at sea without permit in TKO137 fill bank.

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 L).

Table 10.1 Summary of Environmental Complaints and Prosecutions

<i>Complaints logged</i>		<i>Summons served</i>		<i>Successful prosecution received</i>	
<i>July 2017</i>	<i>Cumulative</i>	<i>July 2017</i>	<i>Cumulative</i>	<i>July 2017</i>	<i>Cumulative</i>
0	1	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 period.

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

Since no documented complaints on noise issue were received in this reporting period, 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 period.

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

However, One complaint was received on 15 May 2017, which was forwarded to ET on 11 August 2017, from CEDD (Complaint NCF-N08/RE/00014875-17 Sent By CSO[RN]3 [CASE#2-3943858817 Int.Comm. - WS170513A57354] against illegal dumping at sea without permit in TKO137 fill bank.

According to the ET weekly site inspections carried out in this reporting period, 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.

### Recommendations

According to the environmental site inspections performed in the reporting period, 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 bowser;
- 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, regularly;
- Operate and maintain the silt curtains regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- 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.

**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;
- Maintain the hydroseeded slopes in accordance with the Landscape Plan.

**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.

**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:

1. Operation of the TKO137 Fill Bank.
2. Transferring public fill to vessel and delivering to Taishan and other parties.

**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 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**

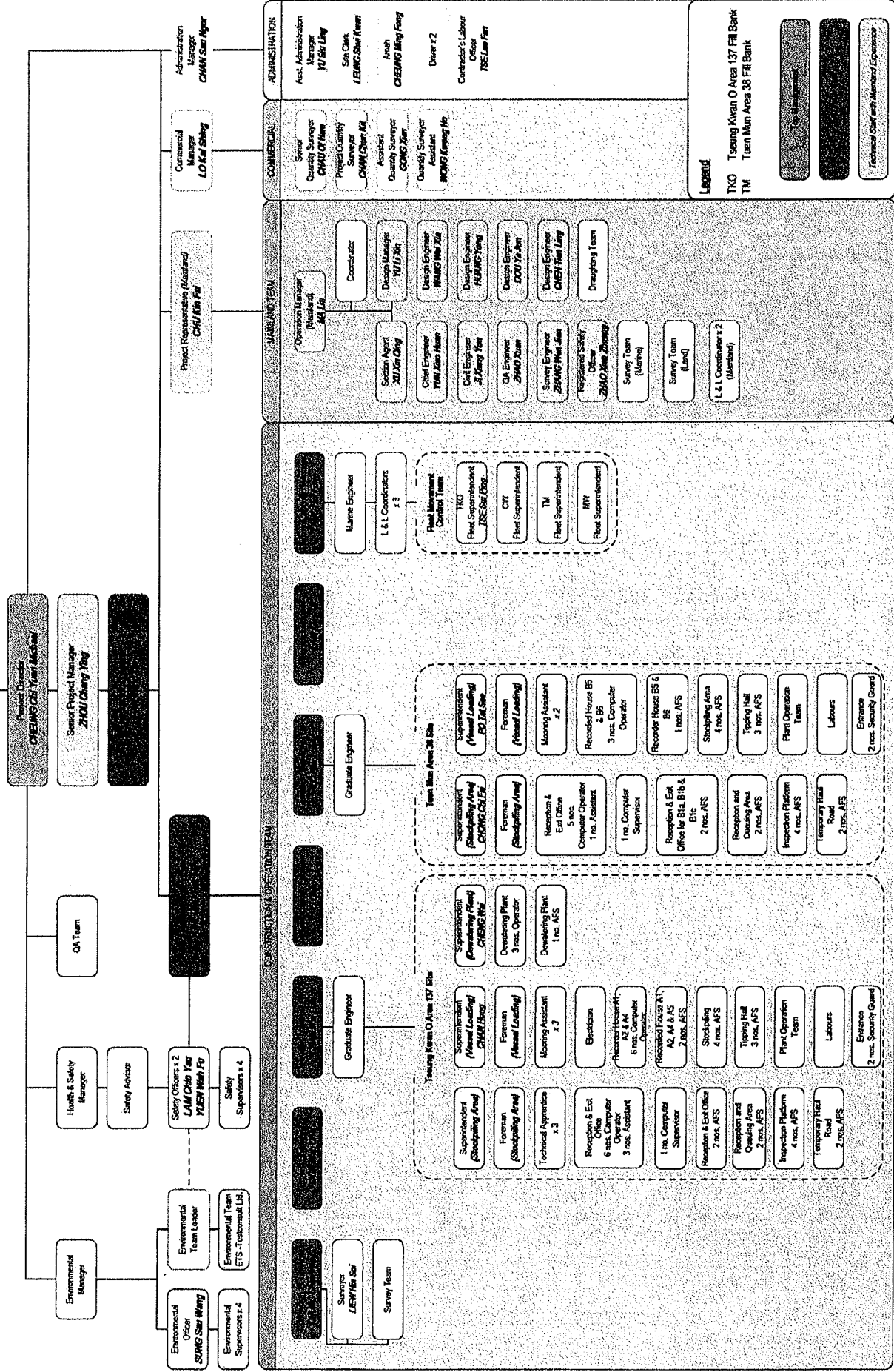
The proposed EM&A program of the coming month is attached in Appendix M.

- END OF REPORT -

## **Appendix A**

### **Project Organization Chart**

**JOINT VENTURE MANAGEMENT BOARD**  
 WING YIP, CHEUNG CHI TUNG, JOCKHAI



**Legend**

TKO Tseung Kwan O Area 137 Fill Bank  
 TM Tuen Mun Area 36 Fill Bank

**TKO** Tseung Kwan O Area 137 Fill Bank  
**TM** Tuen Mun Area 36 Fill Bank

**TKO** Tseung Kwan O Area 137 Fill Bank  
**TM** Tuen Mun Area 36 Fill Bank

**TKO** Tseung Kwan O Area 137 Fill Bank  
**TM** Tuen Mun Area 36 Fill Bank

**TKO** Tseung Kwan O Area 137 Fill Bank  
**TM** Tuen Mun Area 36 Fill Bank



## **Appendix B1**

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



**東業德勤測試顧問有限公司**  
**ETS-TESTCONSULT LTD.™**

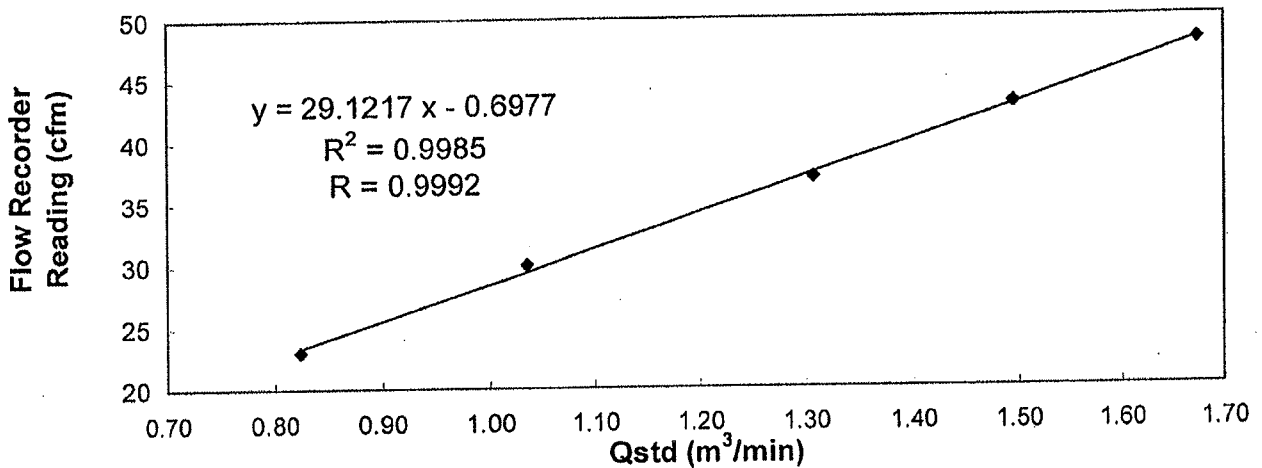
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F: +852 2695 3944  
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W: www.ets-testconsult.com

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

**Manufacturer :** Graseby 105      **Date of Calibration :** 16 May 2017  
**Serial No. :** 9795 (ET/EA/003/18)      **Calibration Due Date :** 15 July 2017  
**Method :** Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

<b>Results</b>	Flow recorder reading (cfm)	48	43	37	30	23
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.67	1.49	1.31	1.03	0.82
	Pressure : 759.06 mm Hg	Temp. : 299 K				

**Sampler 9795 Calibration Curve**  
Site: Tseung Kwan O 137 (TKO-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 : 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 LTD.™

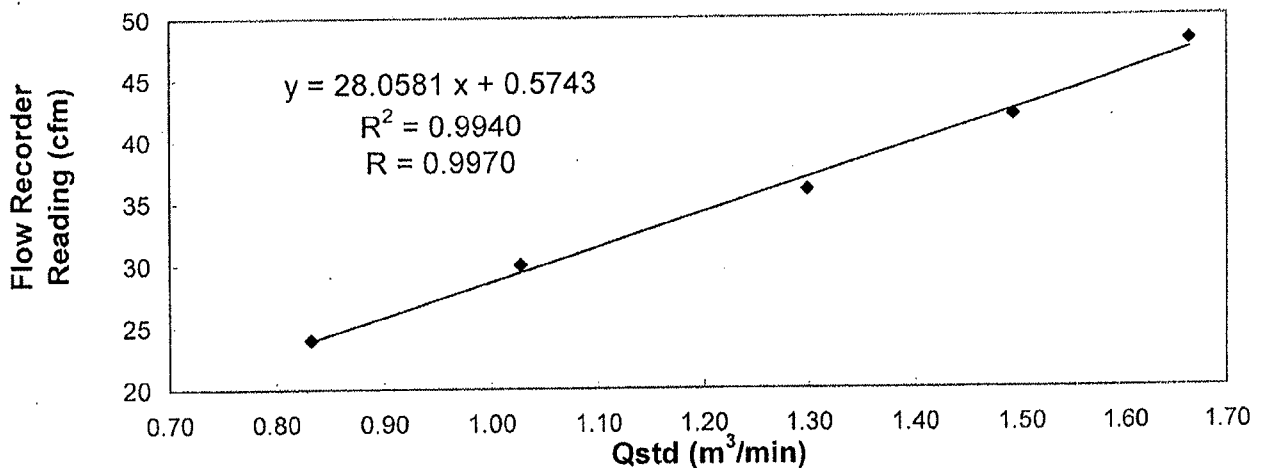
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W: www.ets-testconsult.com

## Calibration Report of High Volume Air Sampler

Manufacturer : Graseby 105 Date of Calibration : 14 July 2017  
 Serial No. : 9795 ( ET / EA / 003 / 18 ) Calibration Due Date : 13 September 2017  
 Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the  
 Operations Manual

Results	Flow recorder reading (cfm)	48	42	36	30	24
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.66	1.49	1.30	1.03	0.83
	Pressure : 756.06 mm Hg	Temp. : 302 K				


**Sampler 9795 Calibration Curve**  
Site: Tseung Kwan O 137 (TKO-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 :   
 KWANI King Ming  
 (Assistant Supervisor)

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



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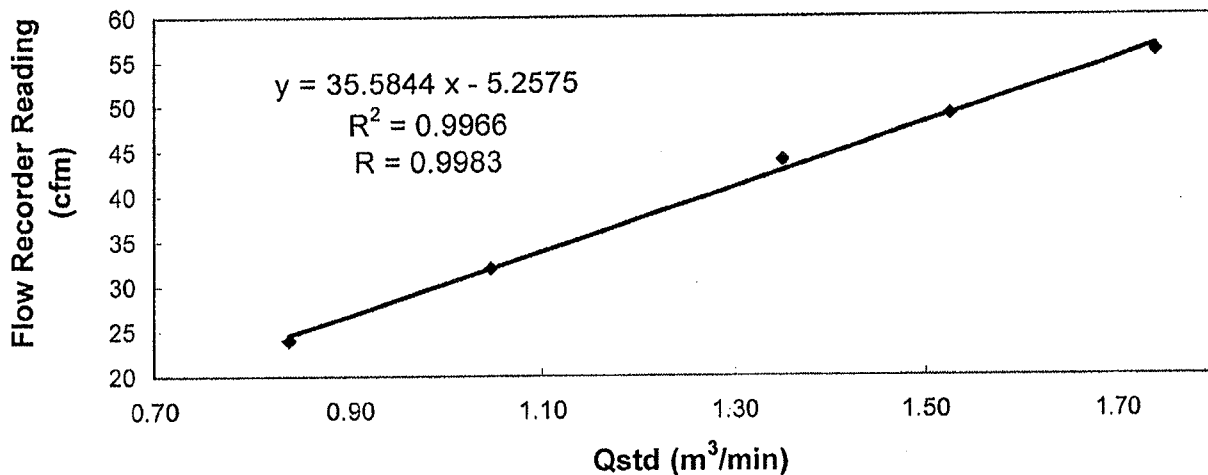
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W: www.ets-testconsult.com

Calibration Report  
of  
High Volume Air Sampler

Manufacturer : Andersen G1051 Date of Calibration : 16 May 2017  
Serial No. : 1176 ( ET / EA / 003 / 05 ) Calibration Due Date : 15 July 2017  
Method : Based on Operations Manual for the 5-point calibration using standard calibration kit  
manufactured by Tisch TE-5025 A

Results	Flow recorder reading (cfm)	56	49	44	32	24
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.74	1.52	1.35	1.05	0.84
	Pressure :	759.06 mm Hg			Temp. :	299 K

**Sampler 1176 Calibration Curve**  
Site: Tseung Kwan O 137 (TKO-A2a)



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 LTD.™

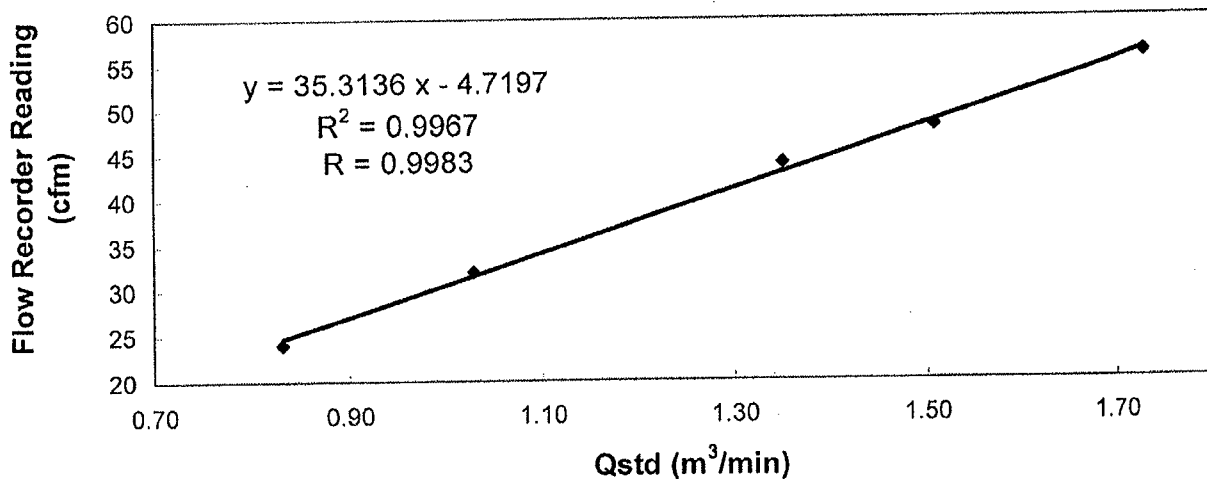
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W: [www.ets-testconsult.com](http://www.ets-testconsult.com)

Calibration Report  
of  
High Volume Air Sampler

Manufacturer : Andersen G1051 Date of Calibration : 14 July 2017  
Serial No. : 1176 ( ET / EA / 003 / 05 ) Calibration Due Date : 13 September 2017  
Method : Based on Operations Manual for the 5-point calibration using standard calibration kit  
manufactured by Tisch TE-5025 A

Results	Flow recorder reading (cfm)	56	48	44	32	24
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.73	1.51	1.35	1.03	0.83
	Pressure :	756.06 mm Hg			Temp. :	302 K

**Sampler 1176 Calibration Curve**  
Site: Tseung Kwan O 137 (TKO-A2a)



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 :   
KWAN, King Ming  
(Assistant Supervisor)

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



ET/EA/004/14

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 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELAND, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Apr 03, 2017 Rootsmeter S/N 0438320 Ta (K) - 295  
 Operator Tisch Orifice I.D. - 3297 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	1.4360	3.2	2.00
2	NA	NA	1.00	1.0230	6.4	4.00
3	NA	NA	1.00	0.9170	7.9	5.00
4	NA	NA	1.00	0.8720	8.8	5.50
5	NA	NA	1.00	0.7180	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9900	0.6894	1.4101	0.9957	0.6934	0.8881
0.9858	0.9636	1.9943	0.9915	0.9692	1.2560
0.9837	1.0727	2.2296	0.9893	1.0789	1.4042
0.9825	1.1268	2.3385	0.9882	1.1333	1.4728
0.9773	1.3612	2.8203	0.9830	1.3691	1.7762
Qstd slope (m) = 2.10166			Qa slope (m) = 1.31603		
intercept (b) = -0.03302			intercept (b) = -0.02080		
coefficient (r) = 0.99984			coefficient (r) = 0.99984		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

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

For subsequent flow rate calculations:

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

## **Appendix 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	
06/07/17	08:00	07/07/17	08:00	17186.74	17210.74	24.00	1.1228	1.1228	1.1228	2.7077	2.8184	68
12/07/17	11:30	13/07/17	11:30	17214.74	17238.74	24.00	1.1228	1.1228	1.1228	2.7108	2.8262	71
18/07/17	08:00	19/07/17	08:00	17240.74	17264.74	24.00	1.1200	1.1200	1.1200	2.7044	2.8170	70
24/07/17	10:30	25/07/17	10:30	17268.74	17292.74	24.00	1.1200	1.1200	1.1200	2.7047	2.8173	70
29/07/17	08:00	30/07/17	08:00	17294.74	17318.74	24.00	1.1200	1.1200	1.1200	2.7163	2.8251	67

Monitoring Station : TKO-A2a  
Location : 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	
06/07/17	08:00	07/07/17	08:00	19173.27	19197.27	24.00	1.0470	1.0470	1.0470	2.7131	2.8290	77
12/07/17	11:35	13/07/17	11:35	19201.27	19225.27	24.00	1.0470	1.0470	1.0470	2.7157	2.8344	79
18/07/17	08:00	19/07/17	08:00	19227.27	19251.27	24.00	1.0398	1.0398	1.0398	2.7162	2.8303	76
24/07/17	10:30	25/07/17	10:30	19255.27	19279.27	24.00	1.0398	1.0398	1.0398	2.7152	2.8310	77
29/07/17	08:00	30/07/17	08:00	19281.27	19305.27	24.00	1.0398	1.0398	1.0398	2.7049	2.8175	75

## 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	
03/07/17	09:10	10:10	17184.74	17185.74	1.00	1.1228	1.1228	1.1228	2.7118	2.7244	187
05/07/17	13:00	14:00	17185.74	17186.74	1.00	1.1228	1.1228	1.1228	2.7144	2.7263	177
07/07/17	13:00	14:00	17210.74	17211.74	1.00	1.1228	1.1228	1.1228	2.7088	2.7217	191
07/07/17	10:25	11:25	17211.74	17212.74	1.00	1.1228	1.1228	1.1228	2.7081	2.7212	194
10/07/17	09:10	10:10	17212.74	17213.74	1.00	1.1228	1.1228	1.1228	2.7098	2.7224	187
12/07/17	10:30	11:30	17213.74	17214.74	1.00	1.1228	1.1228	1.1228	2.7055	2.7177	181
14/07/17	10:40	11:40	17238.74	17239.74	1.00	1.1228	1.1228	1.1228	2.7047	2.7172	186
17/07/17	13:00	14:00	17239.74	17240.74	1.00	1.1200	1.1200	1.1200	2.7117	2.7233	173
19/07/17	13:10	14:10	17264.74	17265.74	1.00	1.1200	1.1200	1.1200	2.7163	2.7290	189
19/07/17	13:00	14:00	17265.74	17266.74	1.00	1.1200	1.1200	1.1200	2.7084	2.7218	199
21/07/17	14:35	15:35	17266.74	17267.74	1.00	1.1200	1.1200	1.1200	2.7057	2.7178	180
24/07/17	09:20	10:20	17267.74	17268.74	1.00	1.1200	1.1200	1.1200	2.7051	2.7177	188
26/07/17	14:30	15:30	17292.74	17293.74	1.00	1.1200	1.1200	1.1200	2.7036	2.7164	190
28/07/17	13:00	14:00	17293.74	17294.74	1.00	1.1200	1.1200	1.1200	2.7051	2.7167	173
31/07/17	09:40	10:40	17318.74	17319.74	1.00	1.1200	1.1200	1.1200	2.7143	2.7269	188
31/07/17	10:40	11:40	17319.74	17320.74	1.00	1.1200	1.1200	1.1200	2.7155	2.7277	182

Monitoring Station : TKO-A2a  
Location : 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	
03/07/17	09:20	10:20	19171.27	19172.27	1.00	1.0470	1.0470	1.0470	2.7087	2.7220	212
05/07/17	13:05	14:05	19172.27	19173.27	1.00	1.0470	1.0470	1.0470	2.7186	2.7314	204
07/07/17	13:00	14:00	19197.27	19198.27	1.00	1.0470	1.0470	1.0470	2.7116	2.7252	216
07/07/17	10:30	11:30	19198.27	19199.27	1.00	1.0470	1.0470	1.0470	2.7183	2.7325	226
10/07/17	09:15	10:15	19199.27	19200.27	1.00	1.0470	1.0470	1.0470	2.7043	2.7178	215
12/07/17	10:35	11:35	19200.27	19201.27	1.00	1.0470	1.0470	1.0470	2.7136	2.7272	216
14/07/17	10:45	11:45	19225.27	19226.27	1.00	1.0470	1.0470	1.0470	2.7103	2.7233	207
17/07/17	13:00	14:00	19226.27	19227.27	1.00	1.0398	1.0398	1.0398	2.7149	2.7278	207
19/07/17	13:20	14:20	19251.27	19252.27	1.00	1.0398	1.0398	1.0398	2.7102	2.7238	218
19/07/17	13:10	14:10	19252.27	19253.27	1.00	1.0398	1.0398	1.0398	2.7026	2.7165	223
21/07/17	14:40	15:40	19253.27	19254.27	1.00	1.0398	1.0398	1.0398	2.7077	2.7211	215
24/07/17	09:25	10:25	19254.27	19255.27	1.00	1.0398	1.0398	1.0398	2.7114	2.7252	221
26/07/17	14:30	15:30	19279.27	19280.27	1.00	1.0398	1.0398	1.0398	2.7089	2.7225	218
28/07/17	13:00	14:00	19280.27	19281.27	1.00	1.0398	1.0398	1.0398	2.7016	2.7139	197
31/07/17	09:45	10:45	19305.27	19306.27	1.00	1.0398	1.0398	1.0398	2.7085	2.7219	215
31/07/17	10:45	11:45	19306.27	19307.27	1.00	1.0398	1.0398	1.0398	2.7186	2.7317	210

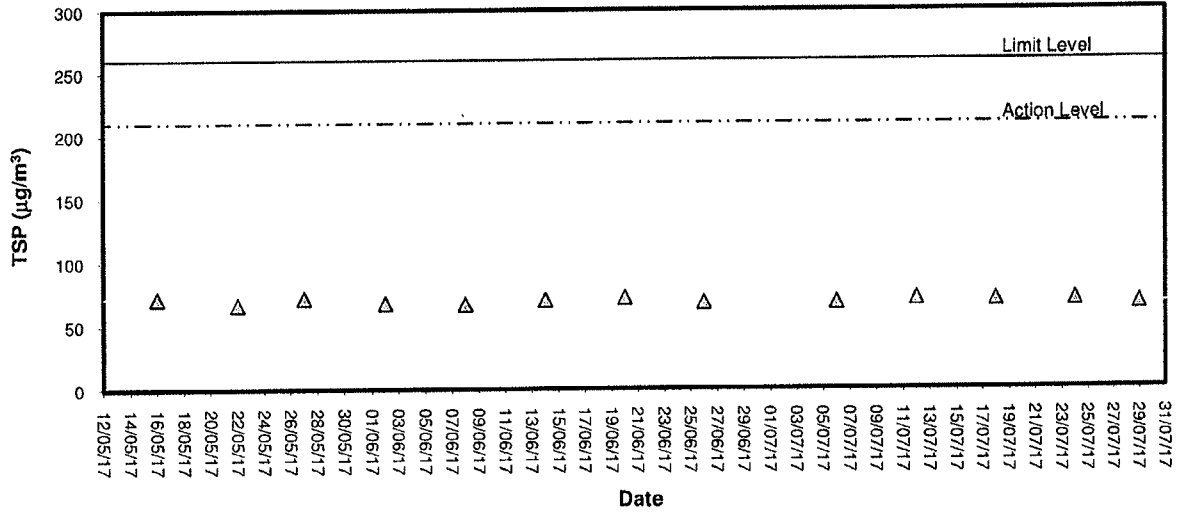
## **Appendix B3**

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

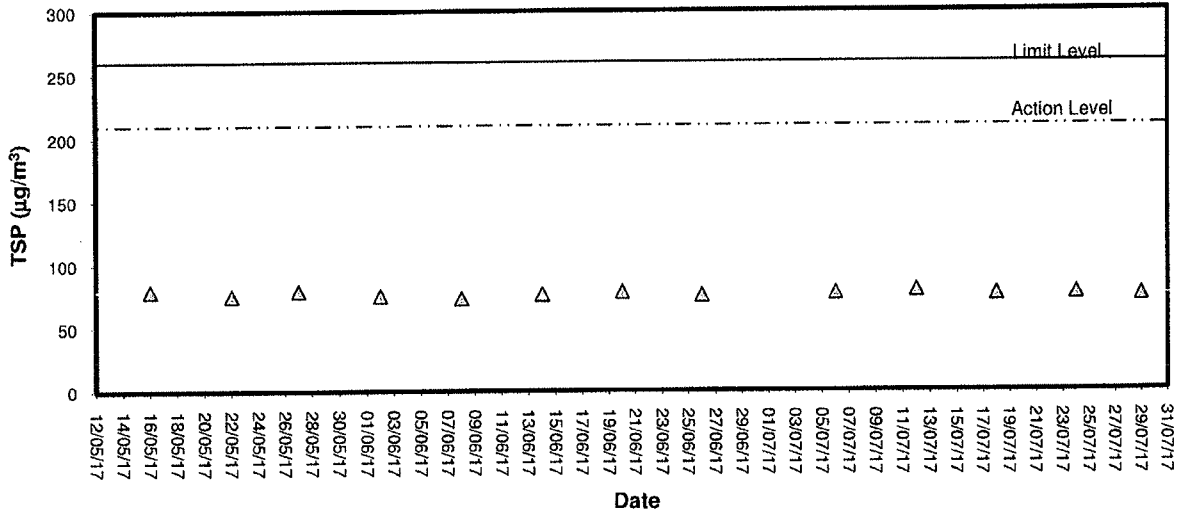




### 24-hour TSP level at TKO-A1

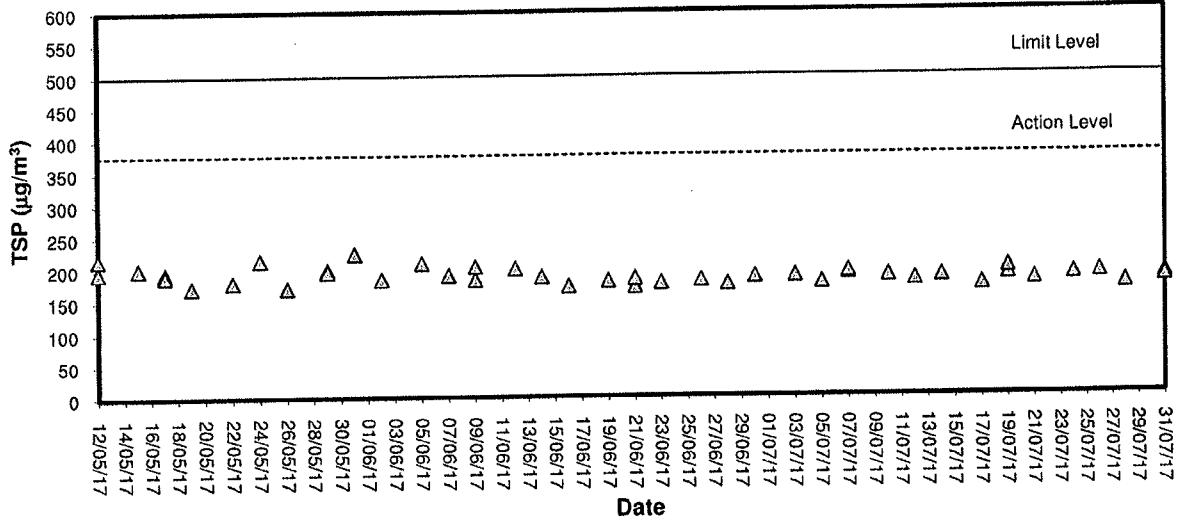


### 24-hour TSP level at TKO-A2a

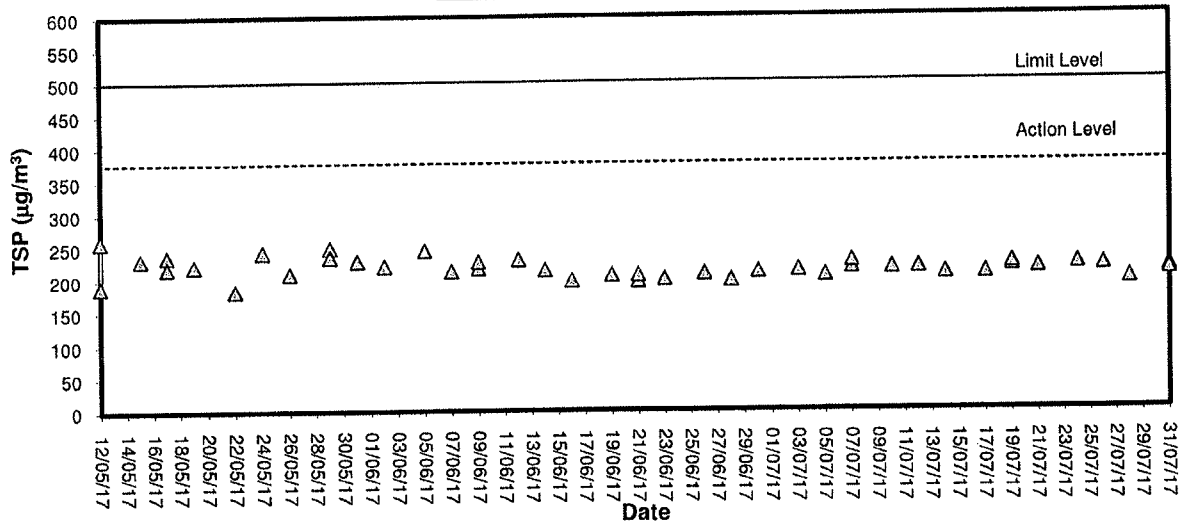




### 1-hour TSP level at TKO-A1



### 1-hour TSP level at TKO-A2a



## **Appendix C1**

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



# Calibration Certificate

Certificate No. 701812

Customer : ETS-Testconsult Limited

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

Order No. : Q70792

Date of receipt : 2-Mar-17

## Item Tested

Description : Sound Level Meter

Manufacturer : Rion

Model : NL-52

I.D. : ET/EN/003/18

Serial No. : 00264520

## Test Conditions

Date of Test : 7-Mar-17

Ambient Temperature : (23 ± 3)°C

Supply Voltage : --

Relative Humidity : (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

## Test Results

All results were within the IEC 61672 Type 1 specification.  
The results are shown in the attached page(s).


Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S017	Multi-Function Generator	C170120	SCL-HKSAR
S240	Sound Level Calibrator	701036	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), or by reference to a natural constant.  
The test results apply to the above Unit-Under-Test only

Calibrated by :   
Kin Wong

Approved by :   
Alan Chu

Date: 7-Mar-17

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



# Calibration Certificate

Certificate No. 701812

Page 2 of 3 Pages

Results :

1. Self-generated noise: 15.7 dBA (Mfr's Spec  $\leq$  17 dBA )
2. Acoustical signal test

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
30-130	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.1
	Z	F	OFF		94.2
	A	F	OFF	114.0	114.0
			OFF		114.0
		C	OFF		114.0
		Z	OFF		114.1

IEC 61672 Type 1 Spec. :  $\pm 1.1$  dB  
Uncertainty :  $\pm 0.1$  dB

### 3 Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.7	- 39.4 dB, $\pm 2$ dB
63 Hz	-26.2	- 26.2 dB, $\pm 1.5$ dB
125 Hz	-16.2	- 16.1 dB, $\pm 1.5$ dB
250 Hz	-8.7	- 8.6 dB, $\pm 1$ dB
500 Hz	-3.2	- 3.2 dB, $\pm 1.4$ dB
1 kHz	0.0 (Ref)	0 dB, $\pm 1.1$ dB
2 kHz	+1.2	+ 1.2 dB, $\pm 1.6$ dB
4 kHz	+1.0	+ 1.0 dB, $\pm 1.6$ dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB $\sim$ -3.1 dB
16 kHz	-8.0	- 6.6 dB, + 3.5 dB $\sim$ - 17.0 dB

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 701812

Page 3 of 3 Pages

## 4. Frequency & Time weightings at 1 kHz

### 4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	--	± 0.4 dB
C	94.	94.1	+0.1	
Z	94.0	94.2	+0.2	

### 4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	--	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

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

3. Atmospheric Pressure : 1012 hPa.

4. Preamplifier model : NH-25 , S/N : 64645

5. Firmware Version: 1.7

6. Power Supply Check: OK

7. The UUT was adjusted with the laboratory's sound calibrator at the reference sound pressure level before the calibration.

----- END -----



# Calibration Certificate

Certificate No. **609158**

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. :** Q63739

**Date of receipt :** 7-Oct-16

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** Rion

**Model :** NC-73

**I.D. :** ET/EN/002/01

**Serial No. :** 10196943

## Test Conditions

**Date of Test :** 24-Oct-16

**Ambient Temperature :** (23 ± 3)°C

**Supply Voltage :** --

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

## Test Results

All results were within the manufacturer's specification.

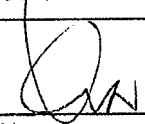
The results are shown in the attached page(s).

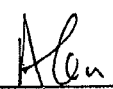
Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	605758	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	601604	NIM-PRC & SCL-HKSAR
S041	Universal Counter	607883	SCL-HKSAR
S206	Sound Level Meter	605757	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), or by reference to a natural constant.  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Kin Wong

**Approved by :**   
Alan Chu

**Date:** 24-Oct-16

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. 609158

Page 2 of 2 Pages

Results :

**1. Level Accuracy (at 1 kHz)**

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.0 dB	± 1 dB

Uncertainty : ± 0.2 dB

**2. Frequency Accuracy**

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.993 kHz	± 2 %

Uncertainty : ± 0.1 %

**3. Level Stability : 0.0 dB**

Uncertainty : ± 0.01 dB

**4. Total Harmonic Distortion : < 0.4 %**

Mfr's Spec. : < 3 %

Uncertainty : ± 2.3 % of reading

- Remarks:
1. UUT : Unit-Under-Test
  2. The uncertainty claimed is for a confidence probability of not less than 95%.
  3. Atmospheric Pressure : 1020 hPa

----- END -----



## **Appendix C2**

### **Impact Noise Monitoring Results**

## Day-time Noise Monitoring

Monitoring Location: TKO-N1 (Site Egress)

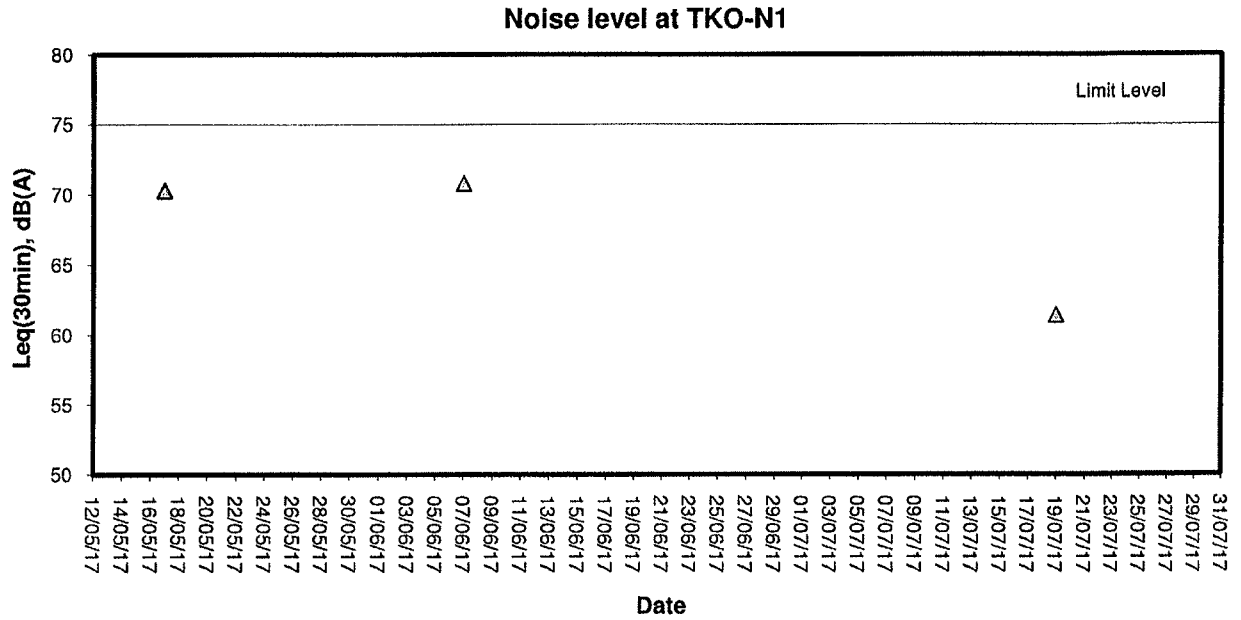
Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L <sub>eq(30min)</sub>	L <sub>10</sub>	L <sub>90</sub>		
19/07/17	13:15	61.4	63.7	58.2	0.2	Cloudy

## **Appendix C3**

### **Graphical Plots of Impact Noise Monitoring Data**



## Noise Monitoring (Day-time)



## **Appendix D1**

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



### Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No. : <u>ET/EW/008/001</u>	Manufacturer : <u>YSI</u>
Model No. : <u>85</u>	Serial No. : <u>05L 1285</u>
Date of Calibration : <u>19/04/2017</u>	Calibration Due Date : <u>18/07/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/017

Ref. No. of Water Bath : ----

		Temperature (°C)		
Reference Thermometer reading	Measured	20.3	Corrected	19.8
DO Meter reading	Measured	19.9	Difference	-0.1

**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/012/4.5/001/15	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/18
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.25
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.25	20.45
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.25	10.20
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02439	0.02451
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02445	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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	10.70	21.50	0.00	6.70	10.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.70	21.50	28.20	6.70	10.30	13.80
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.70	10.80	6.70	6.70	3.60	3.50
Dissolved Oxygen (DO), mg/L	7.02	7.09	4.40	4.40	2.36	2.30
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	7.20	7.21	7.21	7.02	7.09	7.06	2.10
5	4.48	4.51	4.50	4.40	4.40	4.40	2.25
10	2.28	2.31	2.30	2.36	2.30	2.33	1.30
Linear regression coefficient						0.9999	



### 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/012/4.7/003/37	Reagent No. of NaCl (30ppt)	CPE/012/4.8/003/37
-----------------------------	--------------------	-----------------------------	--------------------

**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	10.60	21.10	30.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.60	21.10	30.30	39.50
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.60	10.50	9.20	9.20
Dissolved Oxygen (DO), mg/L	6.96	6.89	6.04	6.04
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	6.99	6.94	6.97	6.96	6.89	6.93	0.58
30	6.04	6.07	6.06	6.04	6.04	6.04	0.33

**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/008/001      Manufacturer : YSI  
Model No. : 85      Serial No. : 05L 1285  
Date of Calibration : 19/04/2017      Due Date : 18/07/2017

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

S/001/9



Salinity Standard Value (ppt)	Measured Salinity (ppt)	Difference * (%)
30.0	30.9	3.0

(\*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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>19/04/2017</u>	Calibration Due Date : <u>18/07/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/017  
 Ref. No. of Water Bath : ---

Temperature (°C)				
Reference Thermometer reading	Measured	19.9	Corrected	19.8
DO Meter reading	Measured	19.9	Difference	-0.1

**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/012/4.5/001/15	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/18
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.25
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.25	20.45
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.25	10.20
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02439	0.02451
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02445	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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	10.70	21.50	0.00	6.70	10.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.70	21.50	28.20	6.70	10.30	13.80
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.70	10.80	6.70	6.70	3.60	3.50
Dissolved Oxygen (DO), mg/L	7.02	7.09	4.40	4.40	2.36	2.30
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	7.22	7.28	7.25	7.02	7.09	7.06	2.66
5	4.31	4.29	4.30	4.40	4.40	4.40	2.30
10	2.29	2.27	2.28	2.36	2.30	2.33	2.17
Linear regression coefficient						0.9987	





## 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 : 19/04/2017      Due Date : 18/07/2017

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

S/001/9

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference * (%)
30.0	30.8	2.7

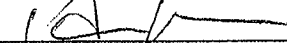
(\*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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>12/07/2017</u>	Calibration Due Date : <u>11/10/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/017

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	19.9	Corrected	19.8
DO Meter reading	Measured	19.9	Difference	-0.1

**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/012/4.5/001/16	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/20
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.50
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.50	20.90
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.50	10.40
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02381	0.02404
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02393	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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	11.20	22.50	0.00	6.40	9.80
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.20	22.50	28.80	6.40	9.80	13.30
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.20	11.30	6.30	6.40	3.40	3.50
Dissolved Oxygen (DO), mg/L	7.20	7.26	4.05	4.11	2.18	2.25
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	7.20	7.18	7.19	7.20	7.26	7.23	0.55
5	4.21	4.25	4.23	4.05	4.11	4.08	3.61
10	2.13	2.18	2.16	2.18	2.25	2.22	2.74
Linear regression coefficient				0.9979			



### 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/012/4.7/004/6	Reagent No. of NaCl (30ppt)	CPE/012/4.8/004/6
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**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	11.50	22.90	33.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.50	22.90	33.00	43.30
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.50	11.40	10.10	10.30
Dissolved Oxygen (DO), mg/L	7.39	7.32	6.49	6.62
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	7.31	7.34	7.33	7.39	7.32	7.36	0.41
30	6.45	6.52	6.49	6.49	6.62	6.56	1.07

**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 : 12/07/2017      Due Date : 11/10/2017

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

S/001/9


Salinity Standard (ppt)	Measured Salinity (ppt)	Difference * (%)
30.0	30.3	1.0

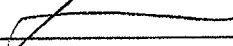
(\*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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/008/006</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A 100554</u>
Date of Calibration : <u>19/04/2017</u>	Calibration Due Date : <u>18/07/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/017

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.0	Corrected	19.9
DO Meter reading	Measured	19.8	Difference	0.1

**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/012/4.5/001/15	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/18
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.25
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.25	20.45
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.25	10.20
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02439	0.02451
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02445	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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	10.70	21.50	0.00	6.70	10.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.70	21.50	28.20	6.70	10.30	13.80
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.70	10.80	6.70	6.70	3.60	3.50
Dissolved Oxygen (DO), mg/L	7.02	7.09	4.40	4.40	2.36	2.30
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	7.18	7.23	7.21	7.02	7.09	7.06	2.10
5	4.32	4.28	4.30	4.40	4.40	4.40	2.30
10	2.32	2.30	2.31	2.36	2.30	2.33	0.86
Linear regression coefficient						0.9987	



### 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/012/4.7/003/37	Reagent No. of NaCl (30ppt)	CPE/012/4.8/003/37
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**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	10.60	21.10	30.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.60	21.10	30.30	39.50
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.60	10.50	9.20	9.20
Dissolved Oxygen (DO), mg/L	6.96	6.89	6.04	6.04
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	7.08	7.04	7.06	6.96	6.89	6.93	1.86
30	6.08	6.11	6.1	6.04	6.04	6.04	0.99

**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/008/006 Manufacturer : YSI  
Model No. : Pro 2030 Serial No. : 12A 100554  
Date of Calibration : 19/04/2017 Due Date : 18/07/2017

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

S/001/9

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.3	1.0

(\*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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/008/006</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A 100554</u>
Date of Calibration : <u>12/07/2017</u>	Calibration Due Date : <u>11/10/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/017

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.0	Corrected	19.9
DO Meter reading	Measured	19.8	Difference	0.1

**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/012/4.5/001/16	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/20
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.50
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.50	20.90
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.50	10.40
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02381	0.02404
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02393	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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
Trial						
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	0.00	11.20	22.50	0.00	6.40	9.80
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.20	22.50	28.80	6.40	9.80	13.30
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.20	11.30	6.30	6.40	3.40	3.50
Dissolved Oxygen (DO), mg/L	7.20	7.26	4.05	4.11	2.18	2.25
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	7.15	7.18	7.17	7.20	7.26	7.23	0.83
5	4.23	4.29	4.26	4.05	4.11	4.08	4.32
10	2.16	2.20	2.18	2.18	2.25	2.22	1.82
Linear regression coefficient				0.9973			



### 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/012/4.7/004/6	Reagent No. of NaCl (30ppt)	CPE/012/4.8/004/6
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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	22.90	33.00
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	11.50	22.90	33.00	43.30
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	11.50	11.40	10.10	10.30
Dissolved Oxygen (DO), mg/L	7.39	7.32	6.49	6.62
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	7.39	7.31	7.35	7.39	7.32	7.36	0.14
30	6.42	6.58	6.5	6.49	6.62	6.56	0.92

**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/008/006      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 12A 100554  
Date of Calibration : 12/07/2017      Due Date : 11/10/2017

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

S/001/9


Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.2	0.7

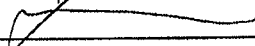
(\*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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/008/007</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12H101061</u>
Date of Calibration : <u>13/05/2017</u>	Calibration Due Date : <u>12/08/2017</u>

**Temperature Verification**

Ref. No. of Reference Thermometer : ET/0521/019

Ref. No. of Water Bath : ---

		Temperature (°C)	
Reference Thermometer reading	Measured	20.3	Corrected
			19.8
DO Meter reading	Measured	19.9	Difference
			-0.1

**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/012/4.5/001/15	Reagent No. of 0.025N K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	CPE/012/4.4/002/19
		Trial 1	Trial 2
Initial Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		0.00	10.25
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)		10.25	20.45
Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)		10.25	10.20
Normality of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02439	0.02451
Average Normality (N) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> solution (N)		0.02445	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, N = 0.25 / 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	10.80	21.60	0.00	6.50	9.90
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.80	21.60	28.00	6.50	9.90	13.20
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.80	10.80	6.40	6.50	3.40	3.30
Dissolved Oxygen (DO), mg/L	7.09	7.09	4.20	4.27	2.23	2.17
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	7.13	7.18	7.16	7.09	7.09	7.09	0.98
5	4.17	4.21	4.19	4.20	4.27	4.24	1.19
10	2.18	2.11	2.15	2.23	2.17	2.20	2.30
Linear regression coefficient						0.9999	

### 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/012/4.7/004/2	Reagent No. of NaCl (30ppt)	CPE/012/4.8/004/2
-----------------------------	-------------------	-----------------------------	-------------------

**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	10.80	21.60	31.30
Final Vol. of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (ml)	10.80	21.60	31.30	41.10
Vol. (V) of Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> used (ml)	10.80	10.80	9.70	9.80
Dissolved Oxygen (DO), mg/L	7.09	7.09	6.37	6.43
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = V x N x 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	7.04	7.01	7.03	7.09	7.09	7.09	0.85
30	6.27	6.31	6.29	6.37	6.43	6.40	1.73

**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/008/007      Manufacturer : YSI  
Model No. : Pro 2030      Serial No. : 12H 101061  
Date of Calibration : 13/05/2017      Due Date : 12/08/2017

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

S/001/9

Salinity Standard Value (ppt)	Measured Salinity (ppt)	Difference * (%)
30.0	28.2	-6.0

(\* ) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 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 Turbidity Meter


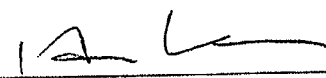
Equipment Ref. No. : <u>ET/0505/014</u>	Manufacturer : <u>HACH</u>
Model No. : <u>2100Q</u>	Serial No. : <u>13110C029448</u>
Date of Calibration : <u>22/05/2017</u>	Due Date : <u>21/08/2017</u>

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	20.8	4.0
100	103	3.0
800	823	2.9

(\* ) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria Difference : -5 % to 5 %

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

Prepared by :       Checked by : 



## Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/015                      Manufacturer : HACH

Model No. : 2100Q    Serial No. : 14110C036534

Date of Calibration : 17/06/2017                      Due Date : 16/09/2017

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	19.1	-4.5
100	99.8	-0.2
800	770	-3.8

(\* ) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria

Difference : -5 % to 5 %

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

Prepared by : *Bain*

Checked by : *[Signature]*





## **Appendix D2**

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

# Mid-Flood Tide



專業檢測顧問有限公司  
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	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
03/07/17	1430-1455	28/Cloudy	Surface	27.2	25.1	78.4	6.47	6.48	6.47	93.8	94.0	3.56	3.58	4.8	4.7			
			Middle	27.1	25.2	25.2	6.43	6.46	6.49	93.2	93.6	3.45	3.46	4.6	4.8	4.8		
			Bottom	27.1	25.2	25.3	6.53	6.55	6.57	94.6	94.9	3.62	3.64	5.1	5.1	5.1		
05/07/17	1630-1647	29/Cloudy	Surface	27.4	25.4	25.2	6.52	6.54	6.56	95.1	95.3	3.36	3.34	3.6	3.3			
			Middle	27.3	25.4	25.5	6.41	6.41	6.41	93.2	93.1	3.48	3.51	4.9	4.9	4.5		
			Bottom	27.1	25.7	25.7	6.72	6.73	6.74	97.5	97.7	3.41	3.43	5.5	5.3	5.0		
07/07/17	1800-1817	30/Cloudy	Surface	27.4	20.7	20.7	7.16	7.15	7.13	101.4	101.2	1.88	1.92	2.4	2.6			
			Middle	27.2	20.9	20.9	7.08	7.07	7.08	100.3	100.1	2.07	2.11	2.6	2.9	2.9		
			Bottom	27.1	21.0	21.0	7.04	7.02	7.00	99.9	99.6	2.46	2.47	3.1	3.3	3.1		
10/07/17	1900-1920	29/Cloudy	Surface	26.5	26.3	26.4	11.52	11.54	11.55	166.2	166.3	3.71	3.73	2.0	2.0			
			Middle	26.4	26.2	26.2	11.73	11.71	11.69	168.8	168.5	3.63	3.66	2.4	2.4	2.8		
			Bottom	26.3	26.3	26.4	11.85	11.87	11.88	170.3	170.6	4.04	4.06	4.0	4.0	4.0		
12/07/17	1000-1012	29/Fine	Surface	28.2	27.3	27.4	9.29	9.32	9.34	138.7	139.1	3.85	3.88	4.0	3.9			
			Middle	28.1	27.5	27.5	9.53	9.55	9.56	142.0	142.2	3.73	3.76	5.0	4.8	4.2		
			Bottom	28.0	27.4	27.6	9.60	9.62	9.63	142.3	142.6	4.19	4.21	4.6	3.9	4.0		
14/07/17	0815-0835	30/Fine	Surface	29.3	21.4	21.5	9.44	9.46	9.47	138.6	138.9	3.83	3.86	2.4	2.5			
			Middle	29.2	21.1	21.2	9.55	9.57	9.58	139.8	140.2	3.95	3.97	1.7	1.7	2.6		
			Bottom	29.1	21.3	21.3	9.42	9.41	9.39	137.9	137.7	4.06	4.09	3.8	3.6	3.4		
17/07/17	1145-1210	30/Cloudy	Surface	28.9	22.1	22.2	6.28	6.31	6.33	92.1	92.5	3.97	4.00	1.1	1.2			
			Middle	28.8	22.4	22.4	6.52	6.54	6.52	95.6	95.8	3.85	3.88	1.2	1.6	1.5		
			Bottom	28.7	22.4	22.5	6.59	6.61	6.62	96.0	96.7	3.90	4.33	1.9	1.7	1.7		
19/07/17	1430-1450	27/Cloudy	Surface	27.7	25.4	25.5	6.02	6.03	6.04	88.1	88.2	3.41	3.42	3.2	3.8			
			Middle	27.6	25.6	25.6	6.10	6.12	6.14	89.3	89.6	3.34	3.33	4.3	3.0	3.5		
			Bottom	27.5	25.6	25.7	6.20	6.21	6.22	90.6	90.7	3.40	3.39	3.9	3.7	3.5		

**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	Value	Average
21/07/17	1700-1722	29/Fine	Surface	27.8	25.4	25.4	6.37	6.39	6.31	93.4	93.6	3.16	3.18	0.8	0.9	2.2		
			Middle	27.6	25.5	25.6	6.22	6.24	6.31	93.8	91.2	3.19	3.05	1.0	4.1			
			Bottom	27.5	25.6	25.7	6.08	6.10	6.10	91.5	89.1	3.02	3.02	1.5	1.6			
24/07/17	1900-1925	29/Cloudy	Surface	27.4	24.9	25.0	6.14	6.16	6.19	88.9	89.5	3.04	0.97	3.0	3.3	3.7		
			Middle	27.5	25.2	25.2	6.18	6.22	6.19	89.3	90.6	0.95	1.15	3.5	4.7			
			Bottom	27.5	25.1	25.3	6.20	6.16	6.16	90.7	89.6	1.13	1.22	3.5	3.3			
26/07/17	0930-0942	29/Cloudy	Surface	28.0	28.7	28.7	5.89	5.88	5.91	89.7	88.2	1.20	3.51	2.0	2.2	3.4		
			Middle	27.9	28.6	28.7	5.87	5.95	5.91	88.4	89.0	1.23	3.61	2.0	5.9			
			Bottom	27.8	28.7	28.8	6.15	5.99	5.99	90.4	89.6	3.52	3.55	2.4	2.2			
28/07/17	0845-0905	30/Fine	Surface	29.2	27.8	27.9	5.95	5.94	5.97	89.5	90.5	2.41	2.42	1.7	2.2	1.8		
			Middle	29.1	27.9	28.0	5.93	6.01	5.97	90.6	91.2	2.43	2.52	2.6	1.4			
			Bottom	28.9	28.0	28.1	6.02	6.05	6.05	91.0	83.0	2.50	2.46	2.1	1.9			
31/07/17	1200-1218	32/Fine	Surface	26.1	26.1	26.1	6.12	6.13	6.18	91.6	91.7	2.43	3.55	2.4	2.3	2.5		
			Middle	28.7	26.2	26.2	6.04	6.24	6.18	91.6	93.5	2.49	3.45	1.4	2.4			
			Bottom	28.7	26.2	26.2	6.23	6.09	6.09	93.4	91.2	3.53	3.48	2.9	2.7			

# Mid-Flood Tide



東業 德 勤 測 試 顧 問 有 限 公 司  
ETS-TESTCONSULT LIMITED

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
03/07/17	1505-1530	28/Cloudy	Surface	27.2	25.0	25.1	6.54	6.56	6.61	94.8	95.1	3.50	3.53	4.4	4.7	4.9		
			Middle	27.2	25.1	25.2	6.63	6.66	6.61	95.4	96.6	3.55	3.65	4.9	4.9			
			Bottom	27.1	25.2	25.3	6.69	6.43	6.43	96.1	93.2	3.67	3.67	4.9	5.1			
05/07/17	1652-1708	29/Cloudy	Surface	27.3	25.3	25.3	6.45	6.47	6.50	92.9	94.2	3.64	3.29	4.9	5.3	5.5		
			Middle	27.3	25.3	25.4	6.48	6.54	6.54	94.2	95.1	3.26	3.35	5.6	5.7			
			Bottom	27.2	25.3	25.5	6.46	6.63	6.63	94.9	96.3	3.39	3.47	5.6	5.5			
07/07/17	1830-1849	30/Cloudy	Surface	27.4	20.6	20.7	7.27	7.26	7.23	96.1	102.8	1.90	1.94	2.5	2.6	2.9		
			Middle	27.4	20.7	20.4	7.24	7.21	7.21	102.6	102.1	1.98	2.18	2.7	2.8			
			Bottom	27.3	20.1	20.8	7.20	7.12	7.12	102.0	101.0	2.14	2.34	2.9	3.2			
10/07/17	1930-1950	29/Cloudy	Surface	26.4	26.3	26.3	11.42	11.43	11.54	100.8	164.5	2.30	3.61	2.9	2.8	2.7		
			Middle	26.4	26.2	26.4	11.44	11.65	11.65	164.3	167.7	3.59	3.76	2.6	1.9			
			Bottom	26.3	26.4	26.3	11.63	11.76	11.76	167.3	169.0	3.74	3.87	1.8	3.5			
12/07/17	1017-1030	29/Fine	Surface	28.1	27.4	27.5	11.77	9.47	9.54	168.0	141.1	3.89	3.77	3.4	3.0	4.6		
			Middle	28.0	27.5	27.6	9.45	9.61	9.61	140.8	143.1	3.74	3.90	3.1	4.5			
			Bottom	27.9	27.6	27.7	9.49	9.75	9.75	143.2	145.0	3.80	4.02	2.8	3.0			
14/07/17	0845-0905	30/Fine	Surface	29.2	21.4	21.4	9.76	9.74	9.69	144.8	143.0	4.03	3.96	2.5	2.4	2.2		
			Middle	29.2	21.3	21.3	9.76	9.64	9.64	142.7	143.0	3.94	4.11	2.3	2.4			
			Bottom	29.1	21.3	21.2	9.65	9.80	9.80	141.7	143.4	4.09	4.19	2.2	2.4			
17/07/17	1220-1245	30/Cloudy	Surface	29.0	22.3	22.3	9.78	6.46	6.53	143.6	95.0	4.17	3.89	2.6	1.5	2.7		
			Middle	28.9	22.2	22.5	6.44	6.60	6.60	94.7	96.9	3.86	4.02	1.1	2.6			
			Bottom	28.9	22.6	22.7	6.48	6.74	6.74	95.2	99.0	3.92	4.14	1.8	1.2			
19/07/17	1501-1519	27/Cloudy	Surface	27.6	25.6	25.6	6.09	6.10	6.14	89.2	89.4	4.15	3.36	4.0	3.2	4.0		
			Middle	27.5	25.5	25.7	6.11	6.18	6.18	89.5	90.3	3.35	3.43	2.4	2.9			
			Bottom	27.3	25.7	25.8	6.19	6.27	6.27	90.1	91.3	3.37	3.38	2.3	3.1			

# 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	Value	Average	Depth-average	Value	Average	Value	Average
21/07/17	1721-1757	29/Fine	Surface	27.9	25.5	25.5	6.44	6.43	6.34	94.7	94.7	3.31	3.34	1.9	1.9	1.9		
			Middle	27.7	25.6	25.7	6.41	6.25	6.34	94.7	91.4	3.37	3.20	1.8	1.7			
			Bottom	27.6	25.7	25.7	6.23	6.25	6.34	91.4	89.3	3.19	3.21	1.7	1.6			
24/07/17	1935-2000	29/Cloudy	Surface	27.4	24.8	24.9	6.10	6.12	6.12	89.6	90.9	3.12	3.10	2.0	2.1	2.1		
			Middle	27.4	24.9	24.9	6.13	6.27	6.17	89.6	91.2	3.08	1.38	2.2	1.9			
			Bottom	27.3	25.1	25.1	6.09	6.08	6.17	91.2	88.6	1.36	1.50	2.0	2.0			
26/07/17	0950-1000	29/Cloudy	Surface	27.9	28.4	28.5	5.94	5.96	5.96	86.4	88.3	1.14	1.16	2.5	2.8	2.8		
			Middle	27.8	28.5	28.6	5.97	6.00	5.96	86.4	89.3	1.17	3.57	2.5	3.5			
			Bottom	27.6	28.6	28.6	5.91	6.07	6.07	88.3	89.3	3.56	3.50	2.7	2.7			
28/07/17	0917-0935	30/Fine	Surface	29.1	27.9	28.0	6.06	6.07	6.07	90.2	90.4	3.58	2.48	3.1	4.2	4.2		
			Middle	29.1	28.0	28.1	5.95	6.06	6.01	90.4	92.4	2.47	2.41	3.1	1.8			
			Bottom	29.0	28.2	28.2	6.04	6.13	6.13	92.0	93.3	2.49	2.43	1.3	1.8			
31/07/17	1226-1245	32/Fine	Surface	28.7	26.2	26.2	6.14	6.16	6.16	93.1	91.2	2.44	3.50	1.9	3.0	3.0		
			Middle	28.7	26.1	26.2	6.17	6.06	6.11	93.1	92.5	2.41	3.49	2.1	2.6			
			Bottom	28.6	26.2	26.2	6.07	6.12	6.12	91.5	90.6	2.42	3.57	1.9	2.2			



**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)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
03/07/17	0850-0900	28/Cloudy	Surface	27.3	25.0	25.0	6.30	6.32	6.34	91.3	91.5	3.65	3.67	5.2	4.9	4.9		
			Middle	27.2	25.0	25.1	6.34	6.36	6.37	91.7	92.1	3.68	3.56	4.6	4.8			
			Bottom	27.1	25.2	25.3	6.39	6.41	6.43	91.9	92.9	3.54	3.57	4.4	4.9			
05/07/17	1000-1018	29/Fine	Surface	27.5	25.2	25.3	6.32	6.33	6.34	92.6	92.3	3.55	3.80	5.1	5.7	5.8		
			Middle	27.4	25.5	25.5	6.19	6.18	6.17	92.4	90.1	3.82	3.65	4.9	5.8			
			Bottom	27.2	25.6	25.5	6.25	6.26	6.27	90.2	90.9	3.68	3.93	5.6	5.9			
07/07/17	1100-1117	29/Cloudy	Surface	27.3	20.9	20.9	7.04	7.06	7.07	90.8	100.0	3.91	2.00	6.0	2.6	2.9		
			Middle	27.2	21.0	21.0	7.12	7.11	7.10	90.9	100.7	3.94	2.19	5.8	3.1			
			Bottom	27.2	21.2	21.3	7.01	7.00	6.98	100.1	100.6	2.27	2.31	5.5	3.2			
10/07/17	1230-1250	30/Fine	Surface	26.6	26.1	26.2	11.38	11.41	11.43	99.8	164.6	1.93	3.82	2.5	2.2	2.2		
			Middle	26.5	26.0	26.1	11.82	11.64	11.65	100.8	167.7	2.06	3.70	2.6	2.4			
			Bottom	27.2	26.2	26.3	11.89	11.71	11.72	100.6	168.4	2.14	4.15	3.0	2.4			
12/07/17	1400-1425	29/Fine	Surface	28.4	27.4	27.5	9.20	9.23	9.25	168.2	138.1	4.13	3.94	2.3	3.5	3.2		
			Middle	28.3	27.6	27.6	9.44	9.46	9.47	137.7	141.5	3.91	3.82	3.4	3.8			
			Bottom	28.2	27.5	27.5	9.51	9.53	9.54	141.7	142.4	3.79	4.27	3.5	2.4			
14/07/17	1500-1520	31/Fine	Surface	29.4	21.2	21.1	9.32	9.34	9.35	142.2	137.6	4.25	3.96	2.3	1.6	1.7		
			Middle	29.3	21.3	21.3	9.48	9.46	9.44	137.8	139.0	3.94	4.10	1.6	2.1			
			Bottom	29.2	21.1	21.2	9.29	9.31	9.33	138.6	142.4	4.07	4.25	2.0	1.5			
17/07/17	1745-1810	30/Cloudy	Surface	29.1	22.3	22.4	6.19	6.24	6.24	136.8	91.6	4.27	4.06	1.5	3.1	3.5		
			Middle	28.9	22.5	22.5	6.43	6.45	6.46	91.2	94.8	4.03	3.94	3.4	2.6			
			Bottom	28.8	22.6	22.6	6.50	6.52	6.53	91.9	95.7	4.08	4.39	2.7	4.8			
19/07/17	0815-0830	27/Cloudy	Surface	27.3	22.5	22.5	5.85	5.86	5.86	95.5	49.4	3.44	3.45	3.6	3.2	3.0		
			Middle	27.3	22.4	22.4	5.90	5.91	5.91	49.2	49.4	3.44	3.54	2.7	3.6			
			Bottom	27.3	22.4	22.4	5.91	5.94	5.95	50.5	50.6	3.46	3.47	3.4	2.3			

# 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
21/07/17	1003-1026	30/Fine	1.0	10.2	27.7	25.2	25.3	6.25	6.27	91.4	91.7	3.27	3.26	1.7	1.7	1.5			
						25.3	6.29	92.0	3.25	1.7									
						25.5	6.13	89.6	3.18	1.4									
24/07/17	1230-1255	29/Cloudy	1.0	10.6	27.6	25.6	25.6	6.18	6.16	90.4	90.0	3.21	3.20	2.3	1.9	3.4			
						25.7	6.01	87.7	3.11	1.3									
						25.6	6.04	88.1	3.14	0.7									
26/07/17	1400-1424	29/Cloudy	1.0	10.2	27.5	25.4	25.5	5.73	5.72	83.6	83.5	1.15	1.17	4.8	3.6	2.6			
						25.5	5.70	83.3	1.18	2.3									
						25.6	5.79	84.5	1.24	4.4									
28/07/17	1530-1553	30/Fine	1.0	10.0	27.4	25.6	25.6	5.81	5.80	84.7	84.6	1.27	1.26	2.5	2.8	1.3			
						25.7	6.04	88.2	1.30	2.4									
						25.8	6.07	88.5	1.33	3.9									
31/07/17	1800-1819	33/Fine	1.0	10.1	27.4	28.7	28.7	5.80	5.79	87.1	87.0	3.56	3.57	2.5	2.6	2.1			
						28.6	5.78	86.8	3.58	2.6									
						28.7	5.84	87.7	3.65	2.5									
28/07/17	1800-1819	33/Fine	1.0	10.1	28.0	28.8	28.8	5.87	5.86	88.1	87.9	3.68	3.67	3.1	2.8	2.1			
						28.8	5.91	88.6	3.59	2.6									
						28.9	5.89	88.4	3.64	2.6									
28/07/17	1800-1819	33/Fine	1.0	10.0	28.1	28.1	28.1	5.86	5.85	89.6	89.4	2.50	2.49	1.3	1.5	1.3			
						28.0	5.83	89.2	2.47	1.7									
						28.1	5.92	90.4	2.56	2.1									
28/07/17	1800-1819	33/Fine	1.0	10.0	29.3	28.2	28.2	5.90	5.91	90.2	90.3	2.61	2.59	0.9	1.5	1.3			
						28.2	5.97	91.0	2.48	0.6									
						28.3	5.94	90.6	2.54	1.3									
28/07/17	1800-1819	33/Fine	1.0	10.0	29.2	26.2	26.3	6.30	6.30	94.4	94.4	3.93	3.92	2.0	2.5	1.3			
						26.3	6.29	94.4	3.90	3.0									
						26.2	6.25	93.7	3.49	1.7									
28/07/17	1800-1819	33/Fine	1.0	10.1	28.9	26.2	26.2	6.23	6.24	93.4	93.6	3.50	3.50	1.9	1.8	2.1			
						26.2	6.21	92.8	3.75	1.9									
						26.1	6.21	93.1	3.76	2.0									

**Mid-Ebb Tide**



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

**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	Bottom		Value	Average	Value	Average	Value	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average
03/07/17	0905-0915	28/Cloudy	1.0	Surface	27.3	25.1	25.1	6.38	6.37	92.5	92.3	3.62	3.65	4.8	4.8	5.0	4.7	4.7	4.7
						25.0	25.0	6.35	6.35	92.0	92.0	3.68	3.68	4.7	4.7		4.7		
						25.1	25.2	6.41	6.43	92.9	93.1	3.73	3.76	5.1	5.1		5.1		
05/07/17	1024-1040	29/Fine	4.6	Middle	27.4	25.2	25.3	6.44	6.43	93.3	93.1	3.78	3.76	5.0	5.0	5.0	4.9	4.9	4.9
						25.2	25.3	6.42	6.43	93.3	93.1	3.78	3.76	5.0	5.0		5.0		
						25.3	25.3	6.43	6.43	93.3	93.1	3.78	3.76	5.0	5.0		5.0		
07/07/17	1127-1145	29/Cloudy	8.3	Bottom	27.3	25.4	25.4	6.26	6.28	90.7	91.0	3.83	3.85	5.2	5.3	2.7	5.2	5.2	5.2
						25.4	25.4	6.29	6.29	91.2	91.2	3.87	3.85	5.3	5.3		5.3		
						25.2	25.2	6.39	6.39	92.8	92.8	3.71	3.66	6.1	6.1		6.1		
10/07/17	1305-1325	30/Fine	1.0	Surface	26.5	20.8	20.9	7.21	7.19	102.1	101.9	1.88	1.92	2.4	2.5	2.3	2.6	2.6	2.6
						26.1	26.2	11.54	11.56	166.3	166.6	3.68	3.71	2.7	2.7		2.7		
						26.1	26.1	11.58	11.58	166.8	166.8	3.74	3.74	2.9	2.9		2.9		
12/07/17	1435-1500	29/Fine	4.7	Middle	26.4	20.9	20.9	7.16	7.18	101.4	101.6	2.08	2.10	2.6	2.6	3.7	2.9	2.9	2.9
						20.9	20.9	7.19	7.18	101.8	101.6	2.11	2.10	2.9	2.9		2.9		
						20.9	21.0	7.08	7.10	100.3	100.5	2.24	2.20	3.0	3.0		3.0		
14/07/17	1530-1550	31/Fine	8.8	Bottom	28.0	21.0	21.0	7.11	7.10	100.7	100.5	2.16	2.20	2.8	2.9	1.8	2.8	2.8	2.8
						26.2	26.2	11.54	11.56	166.3	166.6	3.68	3.71	2.7	2.7		2.7		
						26.1	26.1	11.58	11.58	166.8	166.8	3.74	3.74	2.9	2.9		2.9		
17/07/17	1820-1845	30/Cloudy	1.0	Surface	28.9	27.6	27.6	9.36	9.38	139.9	140.2	3.80	3.83	1.8	2.2	1.7	2.8	2.8	2.8
						27.5	27.5	9.40	9.38	140.4	140.2	3.86	3.83	2.8	2.8		2.8		
						27.6	27.7	9.53	9.52	142.2	142.0	3.94	3.96	5.2	5.2		5.2		
19/07/17	0838-0859	27/Cloudy	4.9	Middle	27.4	27.7	27.7	9.50	9.52	141.8	142.0	3.98	3.96	4.8	5.0	3.1	4.8	4.8	4.8
						27.7	27.7	9.50	9.52	141.8	142.0	3.98	3.96	5.0	5.0		5.0		
						27.7	27.8	9.64	9.66	143.7	143.9	4.06	4.08	3.3	3.3		3.3		
19/07/17	0838-0859	27/Cloudy	8.8	Bottom	27.5	27.8	27.8	9.67	9.66	144.1	143.9	4.09	4.08	3.2	3.3	3.1	3.2	3.2	3.2
						27.8	27.8	9.67	9.66	144.1	143.9	4.09	4.08	3.2	3.2		3.2		
						27.8	27.8	9.67	9.66	144.1	143.9	4.09	4.08	3.2	3.2		3.2		
19/07/17	0838-0859	27/Cloudy	1.0	Surface	27.5	21.3	21.3	9.57	9.59	141.2	141.5	3.99	4.02	1.8	2.2	1.7	2.6	2.6	2.6
						21.2	21.2	9.61	9.59	141.7	141.5	4.05	4.02	2.6	2.6		2.6		
						21.1	21.1	9.46	9.48	139.1	139.4	4.17	4.19	1.7	1.7		1.7		
19/07/17	0838-0859	27/Cloudy	4.9	Middle	27.4	21.0	21.1	9.49	9.48	139.6	139.4	4.21	4.19	2.0	1.9	1.8	2.0	2.0	2.0
						20.9	20.9	9.72	9.74	142.5	142.7	4.28	4.31	1.5	1.5		1.5		
						20.9	20.9	9.75	9.74	142.9	142.7	4.34	4.31	1.4	1.4		1.4		
19/07/17	0838-0859	27/Cloudy	8.8	Bottom	27.5	22.4	22.5	6.35	6.37	93.3	93.6	3.92	3.95	0.8	1.3	1.7	1.8	1.8	1.8
						22.4	22.5	6.39	6.37	93.8	93.6	3.98	3.95	0.8	1.3		0.8		
						22.5	22.5	6.50	6.51	95.5	95.6	4.06	4.08	0.5	0.7		0.5		
19/07/17	0838-0859	27/Cloudy	5.1	Middle	28.8	22.7	22.7	6.52	6.51	95.7	95.6	4.10	4.08	0.8	0.7	1.7	0.8	0.8	0.8
						22.6	22.6	6.63	6.51	95.7	95.6	4.18	4.08	0.8	0.7		0.8		
						22.7	22.8	6.66	6.65	97.1	97.3	4.21	4.20	1.6	1.6		1.6		
19/07/17	0838-0859	27/Cloudy	9.2	Bottom	28.6	22.8	22.8	6.66	6.65	97.5	97.3	4.21	4.20	1.6	1.6	1.7	1.6	1.6	1.6
						22.8	22.8	6.66	6.65	97.5	97.3	4.21	4.20	1.6	1.6		1.6		
						22.8	22.8	6.66	6.65	97.5	97.3	4.21	4.20	1.6	1.6		1.6		
19/07/17	0838-0859	27/Cloudy	1.0	Surface	27.3	22.6	22.6	5.87	5.88	50.1	50.3	3.50	3.51	3.2	3.5	3.1	3.7	3.7	3.7
						22.5	22.5	5.88	5.88	50.4	50.3	3.52	3.51	3.7	3.7		3.7		
						22.5	22.5	5.83	5.84	49.1	49.3	3.43	3.44	4.0	4.0		4.0		
19/07/17	0838-0859	27/Cloudy	5.1	Middle	27.4	22.5	22.5	5.83	5.84	49.4	49.3	3.45	3.44	2.2	2.6	3.1	2.2	2.2	2.2
						22.5	22.5	5.84	5.84	49.4	49.3	3.45	3.44	2.2	2.6		2.2		
						22.4	22.4	5.97	5.98	49.8	49.9	3.47	3.48	2.5	2.5		2.5		
19/07/17	0838-0859	27/Cloudy	9.1	Bottom	27.5	22.4	22.4	5.97	5.98	49.8	49.9	3.47	3.48	2.5	2.9	3.1	2.5	2.5	2.5
						22.4	22.4	5.97	5.98	49.8	49.9	3.47	3.48	2.5	2.9		2.5		
						22.3	22.3	5.98	5.98	50.0	50.0	3.49	3.48	3.2	3.2		3.2		

**Mid-Ebb Tide**

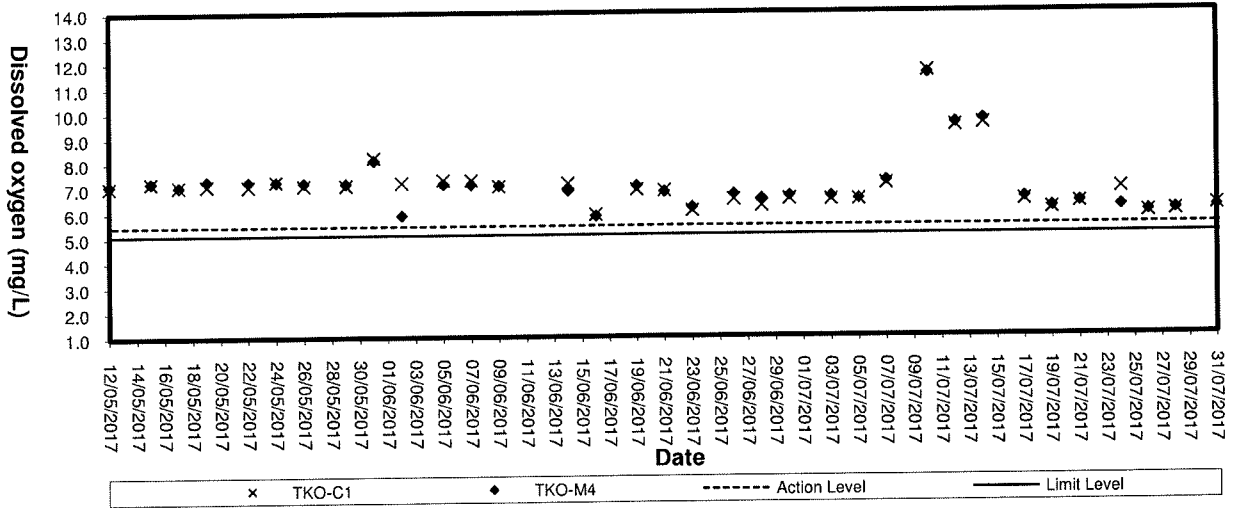
**Monitoring Station : TKO-M4**

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	Value	Average	Value	Average	Value	Average	Depth-average	Value
21/07/17	1034-1054	30/Fine	Surface	27.8	25.4	25.5	6.34	6.36	93.0	93.4	3.45	3.47	2.5	1.8	1.5	
			Middle	27.8	25.6	25.7	6.38	6.07	93.7	89.1	3.48	3.24	1.0	1.5		
			Bottom	27.6	25.5	25.5	6.04	6.09	88.7	89.1	3.22	3.17	2.0	1.3		
24/07/17	1305-1330	29/Cloudy	Surface	27.3	25.3	25.3	6.08	5.83	88.9	84.9	3.16	1.45	1.6	1.7	3.7	
			Middle	27.4	25.4	25.5	6.10	6.03	84.7	88.0	1.43	1.51	1.7	2.4		
			Bottom	27.4	25.7	25.8	5.81	5.60	85.0	84.9	1.46	1.06	2.0	7.0		
26/07/17	1432-1500	29/Cloudy	Surface	28.0	28.7	28.8	5.61	5.81	82.0	87.2	1.04	3.63	4.5	3.2	2.7	
			Middle	27.8	28.8	28.8	5.59	5.91	87.3	88.3	3.62	3.56	4.5	2.2		
			Bottom	27.7	28.9	29.0	5.82	5.98	87.1	89.3	3.64	3.61	1.9	2.6		
28/07/17	1606-1623	30/Fine	Surface	29.3	28.2	28.2	5.80	5.87	89.8	89.7	2.55	2.54	1.5	1.3	1.2	
			Middle	29.1	28.2	28.3	5.86	5.97	89.5	90.8	2.53	2.47	1.0	1.2		
			Bottom	29.1	28.3	28.4	5.95	6.03	90.6	91.7	2.46	2.50	1.4	1.2		
31/07/17	1828-1848	33/Fine	Surface	29.1	26.3	26.3	6.04	6.38	91.9	95.7	2.51	3.91	1.1	1.7	2.5	
			Middle	28.9	26.2	26.2	6.01	6.29	91.5	94.2	2.49	3.63	1.3	2.9		
			Bottom	29.0	26.1	26.1	6.37	6.20	95.6	92.9	3.90	3.54	1.6	2.9		

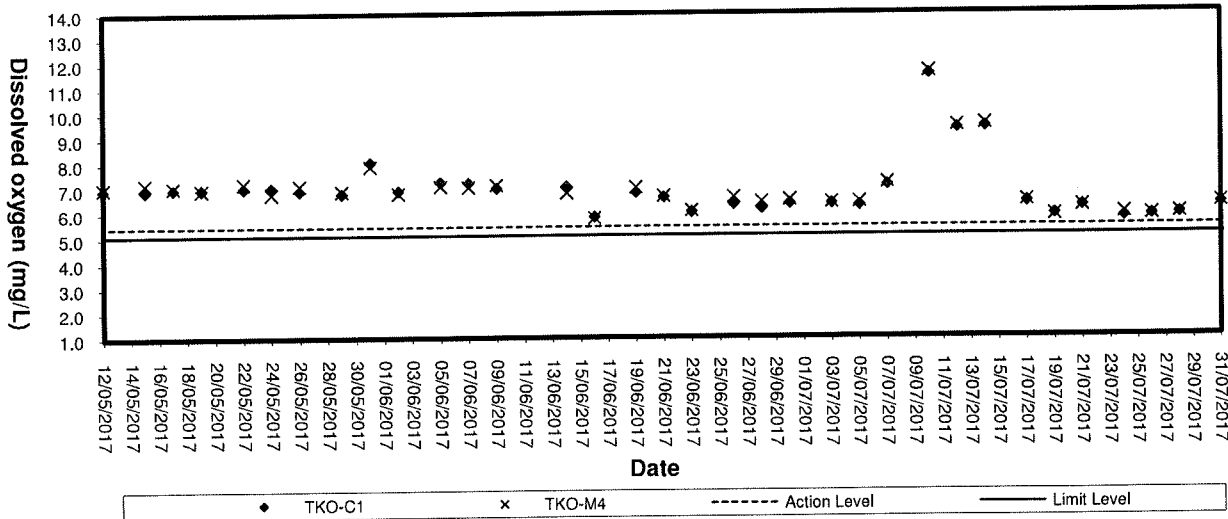
## **Appendix D3**

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

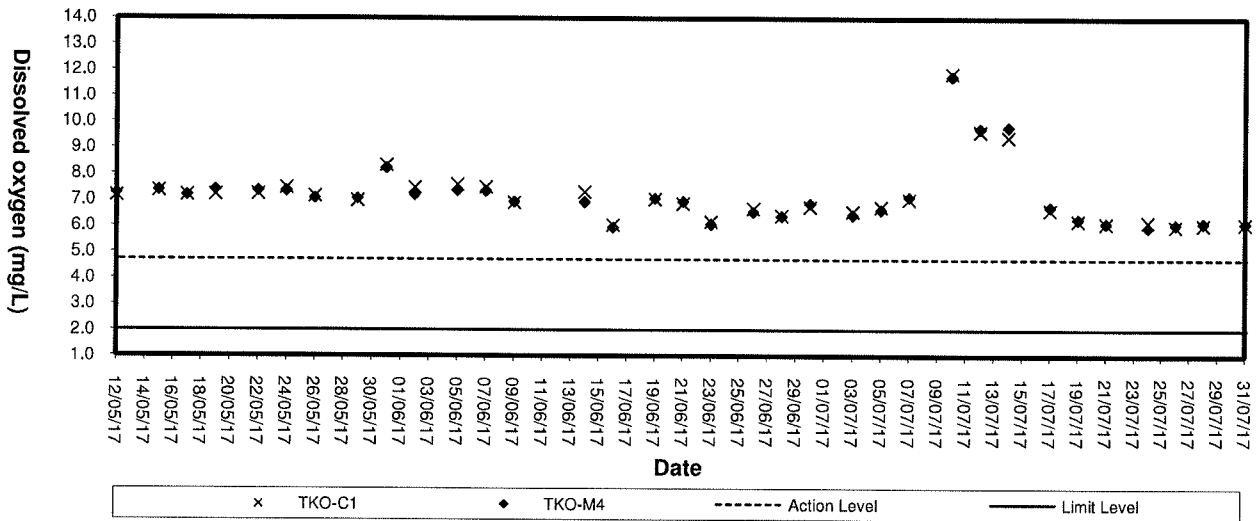
**Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide**



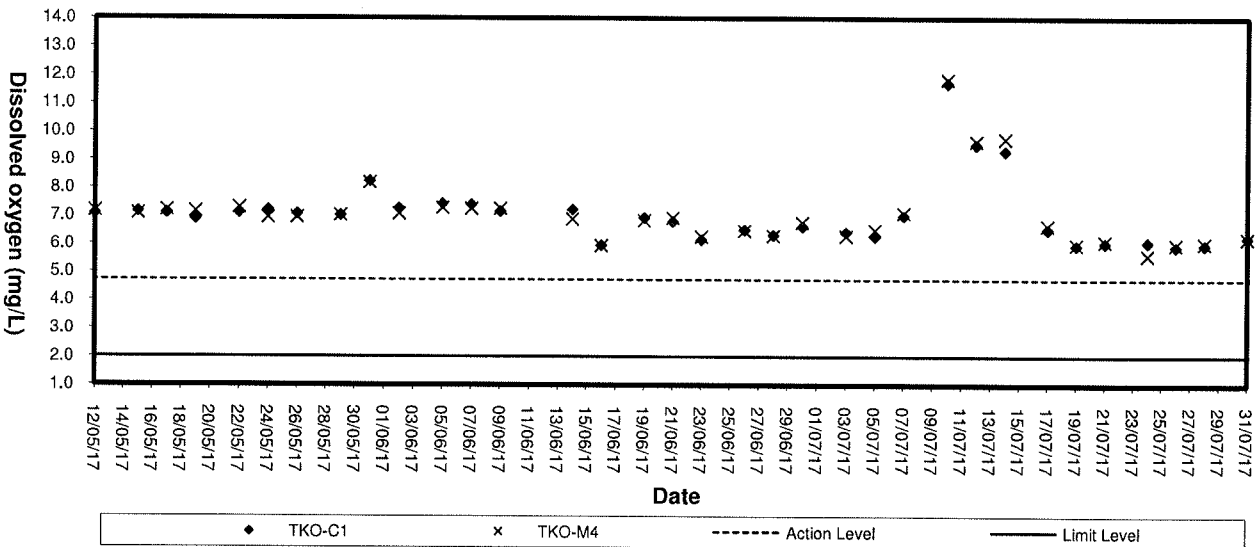
**Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide**



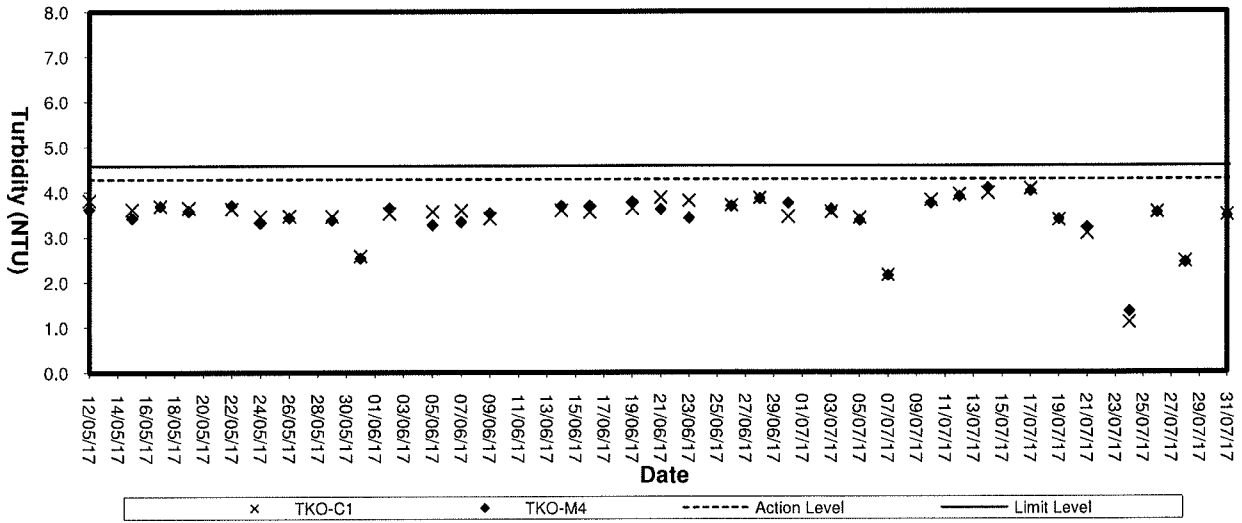
**Dissolved Oxygen (Bottom) at Mid-Flood Tide**



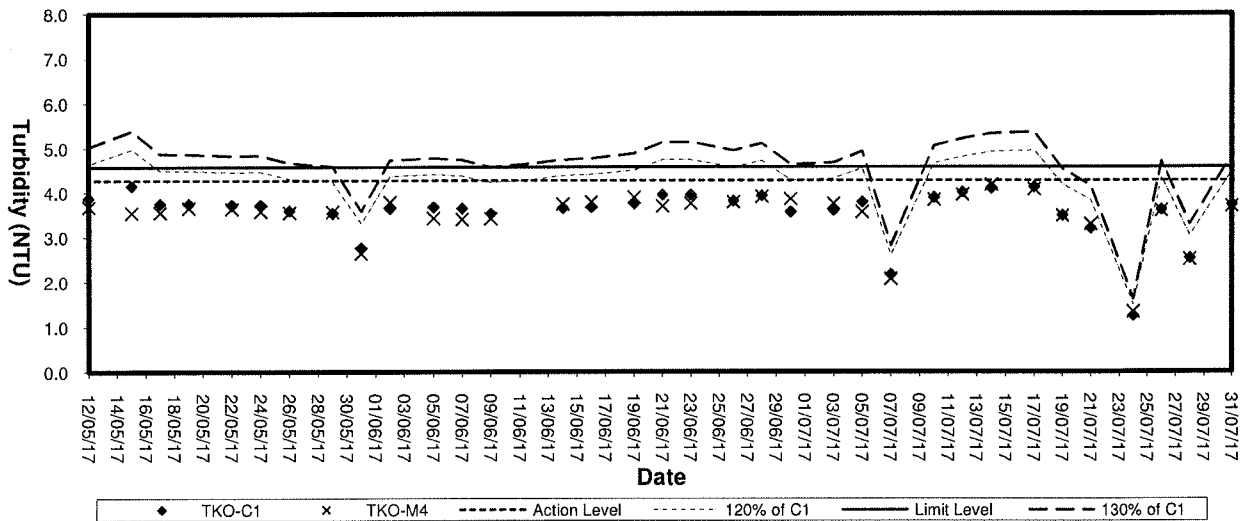
**Dissolved Oxygen (Bottom) at Mid-Ebb Tide**



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

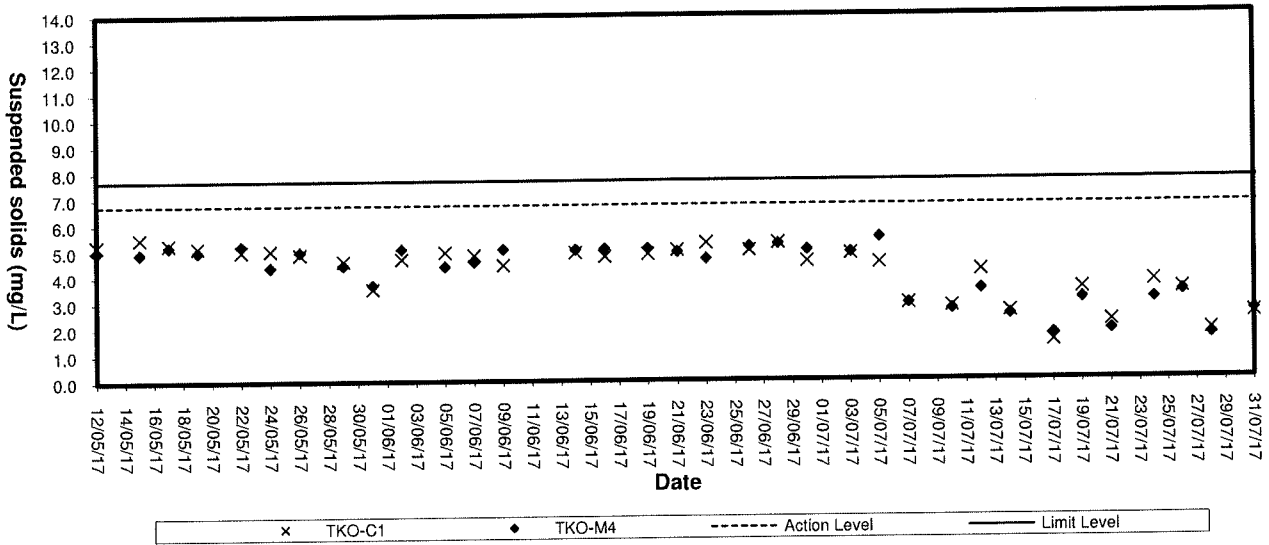


**Turbidity (Depth-average) at Mid-Ebb Tide**

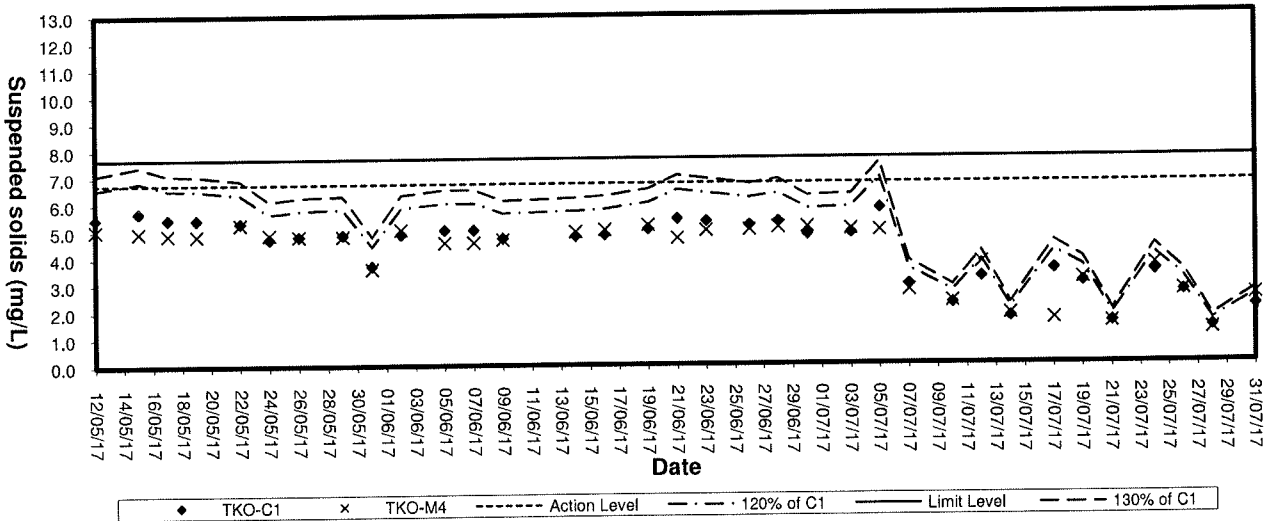




**Suspended solids (Depth-average) at Mid-Flood Tide**



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



## **Appendix E**

### **Weather Condition**

## Daily Extract of Meteorological Observations, July 2017 – Tseung Kwan O

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	***	32.4	28.6	25.4	25.1	82	11.5	180	4.5
02	***	30.8#	27.9	25.5#	25.9	89	3.5	190	3.8
03	***	30.9	27.9	25.8	25.7	88	2.5	190	4.8
04	***	29.5	26.0	24.6	25.1	95	47.0	060	3.9
05	***	30.2	27.4	25.1	25.7	91	13.5	070	6.0
06	***	29.7	27.1	25.7	25.6	92	30.0	110	6.5
07	***	31.1	27.0	25.2	25.0	89	10.0	100	5.5
08	***	28.6	27.0	25.5	26.0	94	20.0	200	3.3
09	***	31.7	28.7	26.5	25.7	84	1.5	190	5.3
10	***	32.6	28.8	25.8	25.1	81	0.0	190	5.4
11	***	32.2	28.8	26.0	25.2	82	0.0	190	4.4
12	***	32.1	28.7	26.4	25.5	84	0.0	110	4.5
13	***	32.8	29.4	26.5	26.0	83	0.0	120	6.0
14	***	31.9	28.7	26.2	25.9	85	12.0	130	6.2
15	***	31.8	28.7	26.3	25.6	83	1.5	120	7.0
16	***	28.9	27.5	25.9	25.6	90	21.0	120	7.0
17	***	28.7	26.0	24.2	25.1	95	213.5	070	6.0
18	***	28.7	25.9	24.5	25.0	95	183.0	110	6.0
19	***	30.5	26.9	24.1	25.5	92	26.0	010	4.3
20	***	30.0	28.1	26.4	26.1	89	3.5	060	6.3
21	***	32.1	29.0	26.8	25.9	84	0.0	060	7.1
22	***	32.5	28.8	25.7	25.5	83	0.5	070	6.2
23	***	27.7	26.5	25.4	25.0	92	17.0	340	6.2
24	***	30.3	27.3	25.1	25.9	92	15.5	020	5.1
25	***	31.7	28.7	26.7	26.2	87	0.5	050	4.6
26	***	34.1	28.7	25.5	25.2	83	0.0	030	4.5
27	***	30.9	28.4	26.6	25.5	85	0.0	040	6.3
28	***	34.2	29.8	27.2	24.8	76	0.0	010	7.3
29	***	35.6	30.5	26.7	26.0	78	0.0	190	4.5
30	***	36.4	31.7	27.6	26.8	76	0.0	190	5.5
31	***	33.4	30.8	28.9	26.6	78	0.0	190	7.2

\*\*\* unavailable

# data incomplete

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

## **Appendix F**

### **Event-Action Plans**

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			Contractor
	ET Leader	IC(E)	ER	
	<b>ACTION LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Inform ER, IC(E) and Contractor</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET</li> <li>2. Check contractor's working method</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practise</li> <li>2. Amend working methods if appropriate</li> </ol>
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. Inform IC(E) and Contractor</li> <li>3. Repeat measurements to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. Discuss with IC(E) and Contractor on remedial actions</li> <li>6. If exceedance continues, arrange meeting with IC(E) and ER.</li> <li>7. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET</li> <li>2. Check Contractor's working method</li> <li>3. Discuss with ET and Contractor on possible remedial measures</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures</li> <li>5. Supervise 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. Ensure remedial measures properly implemented</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to IC(E) within 3 working days of notification</li> <li>2. Implement the agreed proposals</li> <li>3. Amend proposal if appropriate</li> </ol>
	<b>LIMIT LEVEL</b>			
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures</li> <li>2. Inform ER, Contractor and EPD</li> <li>3. Repeat measurement to confirm finding</li> <li>4. Increase monitoring frequency to daily</li> <li>5. 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>1. Check monitoring data submitted by the ET</li> <li>2. Check Contractor's working method</li> <li>3. Discuss with ET and Contractor on possible remedial measures</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures</li> <li>5. Supervise 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. Ensure remedial measures properly implemented</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. 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

EVENT	ACTION			
	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
Action level being exceeded by one sampling day	<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		
	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>
			<p style="text-align: center;">IEC</p> <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			IEC
	ET Leader	Contractor	ER	
Limit level being exceeded by one sampling day	<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 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 G**

### **Works Programme**



## **Appendix H**

### **Weekly ET's Site Inspection Record**

CEDD Contract No.: CV/2015/07

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Inspection Date : 5/7/17


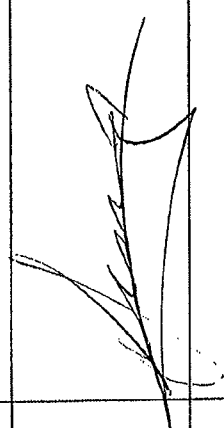
Time : 14:40

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

Wind : Calm / Light Breeze / Strong

Temperature : 31°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Mak
Name:	C K Fung	Samsund	Mak dei Wai
Title	AI	Co.	ET

Implementation Stages*	Implementation Stages*		Remark
	Yes	No	
<b>Environmental Checklist</b>			
<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.
✓			Approval of exemption Non-road Mobile Machinery (NPRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).
<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.



	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 (BHA) 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 debris.	√			
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 berthing 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>	√			Item 2

**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
1	Follow up action to item 2 on 28/06/17, watering was note don the haul road near dry mud zone.	--	170705_001	No	--
2	Rubbish, such as plastic sheets, was discarded inside the drainage channel near CEDD site office.	To collect and dispose of the rubbish properly.	170705_002	Yes	12/07/17

Remark

—

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		05 July 2017



Photo



Photo 170705\_001 (Dry mud zone) (Improved)


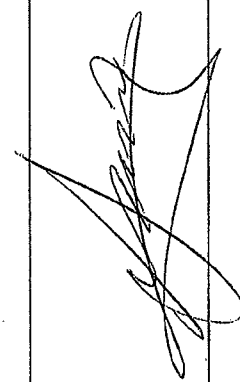


Photo 170628\_002 (Drainage channel near CEDD site office)

CEDD Contract No.: CV/2015/07

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Inspection Date : 12/7/17  
 Time : 15:00  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 32°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Blank
Name:	Y.P. Tsang	Sun Suardi	Blank for use
Title	Low	EO-	ET

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

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.	✓		
▪ Approval or exemption Non-road Mobile Machinery (NRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).	✓		
<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.	✓		

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Implementation Stages*		Remark
<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 property.
✓	✓	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 treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer 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 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 (BHA) 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.

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Implementation Stages*	Implementation Stages*		Remark
	Yes	No	
<b>Environmental Checklist</b>			
<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>	<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 displayed 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>		

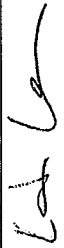


**Summary of the Weekly Site Inspection:**

Item	Details of defective works or observations	Proposed Follow Up Action	Photo Ref.	Further Action Required (Yes/No)	Follow up Date
1	Follow up action to item 2 on 05/07/17, rubbish, such as plastic sheets, discarded inside the drainage channel near CEDD site office was collected.	--	170712_001	No	--
2	Mud was accumulated inside the drainage channel near weighbridge.	To clear the accumulated mud properly to avoid any blockage.	170712_002	Yes	19/07/17

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		12 July 2017

Photo

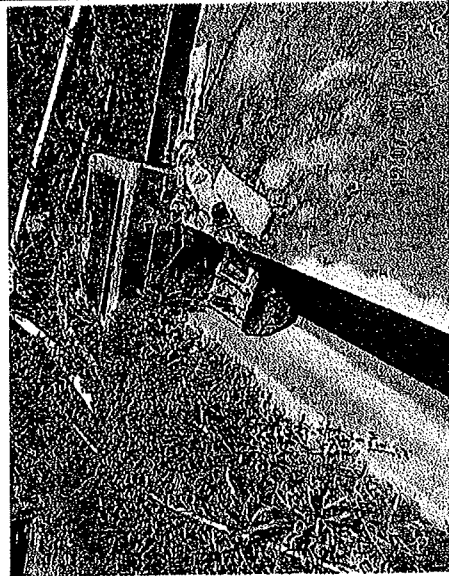



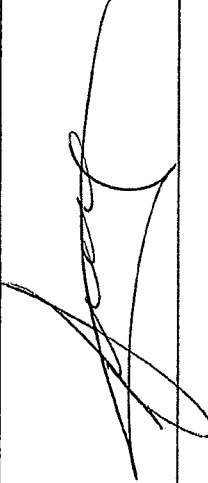
Photo 170712\_001 (Drainage channel near CEDD site office) (Improved)



Photo 170712\_002 (Drainage channel near weighbridge)

CEDD Contract No.: CV/2015/07  
Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Inspection Date : 19/7/17  
 Time : 15:00  
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy  
 Wind : Calm / Light / Breeze / Strong  
 Temperature : 30°C  
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			Mark
Name:	YP Tsang	S.M. Yip	Mark Yip Man
Title	Env	EO	ET

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
<b>Fugitive Dust Emission</b>				
<ul style="list-style-type: none"> <li>▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.</li> <li>▪ 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.</li> <li>▪ Water sprays shall be provided and used to dampen materials.</li> <li>▪ Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions.</li> <li>▪ All vehicles shall be restricted to a maximum speed of 10 km per hour.</li> <li>▪ 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.</li> <li>▪ The designated site main haul road shall be paved or regular watering.</li> <li>▪ Frequent watering of work site shall be at least three times per day.</li> <li>▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.</li> <li>▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.</li> <li>▪ All plant and equipment should be well maintained e.g. without black smoke emission.</li> <li>▪ Open burning should be prohibited.</li> <li>▪ 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.</li> <li>▪ 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.</li> <li>▪ When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides.</li> <li>▪ The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt.</li> <li>▪ 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.</li> <li>▪ Approval or exemption Non-road Mobile Machinery (NRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).</li> </ul>	√			
<b>Noise Impact</b>				
<ul style="list-style-type: none"> <li>▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.</li> <li>▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.</li> <li>▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.</li> <li>▪ Air compressors and hand held breakers should have noise labels.</li> <li>▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.</li> <li>▪ Noisy equipment and mobile plant shall always be site away from NSRs.</li> </ul>	√			

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 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.	✓		Item 2
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 (BHA) 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.	✓		Item 2
A waste collection vessel shall be deployed to remove floating debris.	✓		


Implementation Stages*	Implementation Stages*		Remark
	Yes	No	
<b>Environmental Checklist</b>			
<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.
✓			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)	Follow up Date
1	Follow up action to item 2 on 12/07/17, mud accumulated inside the drainage channel near weighbridge was cleared.	---	170719_001	No	---
2	Silt curtain near tipping hall no.1 was noted damaged.	To repair the damaged part of silt curtain properly.	170719_002	Yes	26/07/17

Remark

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	Name	Title	Signature	Date
Checked by	Linda Law	Senior Environmental Officer		19 July 2017

Photo



Photo 170719\_001 (Drainage channel near weighbridge) (Improved)



Photo 170719\_002 (Silt curtain near tipping hall No.1)



CEDD Contract No.: CV/2015/07

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Inspection Date : 26 Jul 2017


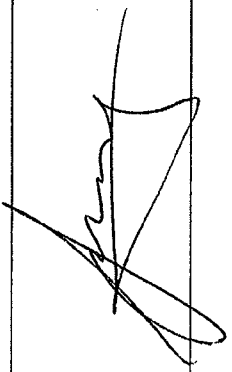

Time : 15:30

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

Wind : Calm / Light / Breeze / Strong

Temperature : 32.2

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	C. K. PING	S. NG	W. H.
Title	ATOW	Co	GT

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 CEED.	✓		
▪ 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 CEED.	✓		
▪ 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.	✓		
▪ Approval or exemption Non-road Mobile Machinery (NRMM) labels should be painted or securely fixed on regulated machines and non-road vehicles at a conspicuous position according to the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (APCO Cap.311).	✓		
<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.	✓		

Handling of Surplus Public Fill (2016-2018) - Tseung Kwan O Area 137 Fill Bank

Implementation Stages*	Implementation Stages*		Remark
	Yes	No	
<b>Water Quality</b>			
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√		Item 2
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 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 (BHA) 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)	Follow up Date
1	Follow up action to item 2 on 19/07/17, silt curtain near tipping hall no.1 was repaired..	---	170726_001	No	---

Remark

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Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		26 July 2017

Photo


		
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Photo 170726\_001 (Silt curtain near tipping hall No.1) (Improved)

## **Appendix I**

### **Implementation Schedule of Mitigation Measures**





	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
<b>Water Quality</b>				
Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	All areas	✓	✓	
The permanent drainage channels should have sediment basin, traps and baffles and maintain properly.	All areas	✓		
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.	All areas	✓		
Manholes should be covered and sealed.	All areas	✓		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	All areas	✓		
A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front.	Public fill stockpiling area	✓		
A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	C&DMSF	✓		
The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	All areas	✓		
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.	Temporary Slopes	✓		
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.	Temporary Slopes	✓		
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.	All areas	✓		
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.	Wheel Washing facility	✓		
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.	Wheel Washing facility	✓		
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.	All areas	✓		
Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas and work shop.	All areas	✓		
Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water.	Barge Handling Area (BHA)	✓		
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.	Barge Handling Area (BHA)	✓		
All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport.	Barge Handling Area (BHA)	✓		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	Along the seafront	✓		
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.	Barge Handling Area (BHA)	✓		
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.	Along the seafront	✓		
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.	Along the seafront		✓	
A waste collection vessel shall be deployed to remove floating debris.	Along the seafront	✓		

Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
<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> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>The maximum stockpiling height at the fill bank shall be limited to a maximum of +35.2mPD.</li> </ul>	Completed slopes	√			
<ul style="list-style-type: none"> <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> </ul>	Site boundary	√			
<ul style="list-style-type: none"> <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>	All areas	√			
<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 transfer to SENT landfill for disposal.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Plan and stock construction materials carefully to minimise generation of waste.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Any unused materials or those with remaining functional capacity should be recycled.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>All generators, fuel and oil storage are within bunded areas.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>Oil leakage from machinery, vehicle and plant is prevented.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <li>The Environmental Permit should be displaced conspicuously on site.</li> </ul>	All areas	√			
<ul style="list-style-type: none"> <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> </ul>	All areas		√		
<ul style="list-style-type: none"> <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>	All areas	√			

## **Appendix J**

### **Site General Layout plan**

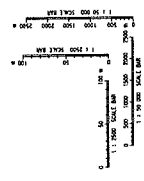
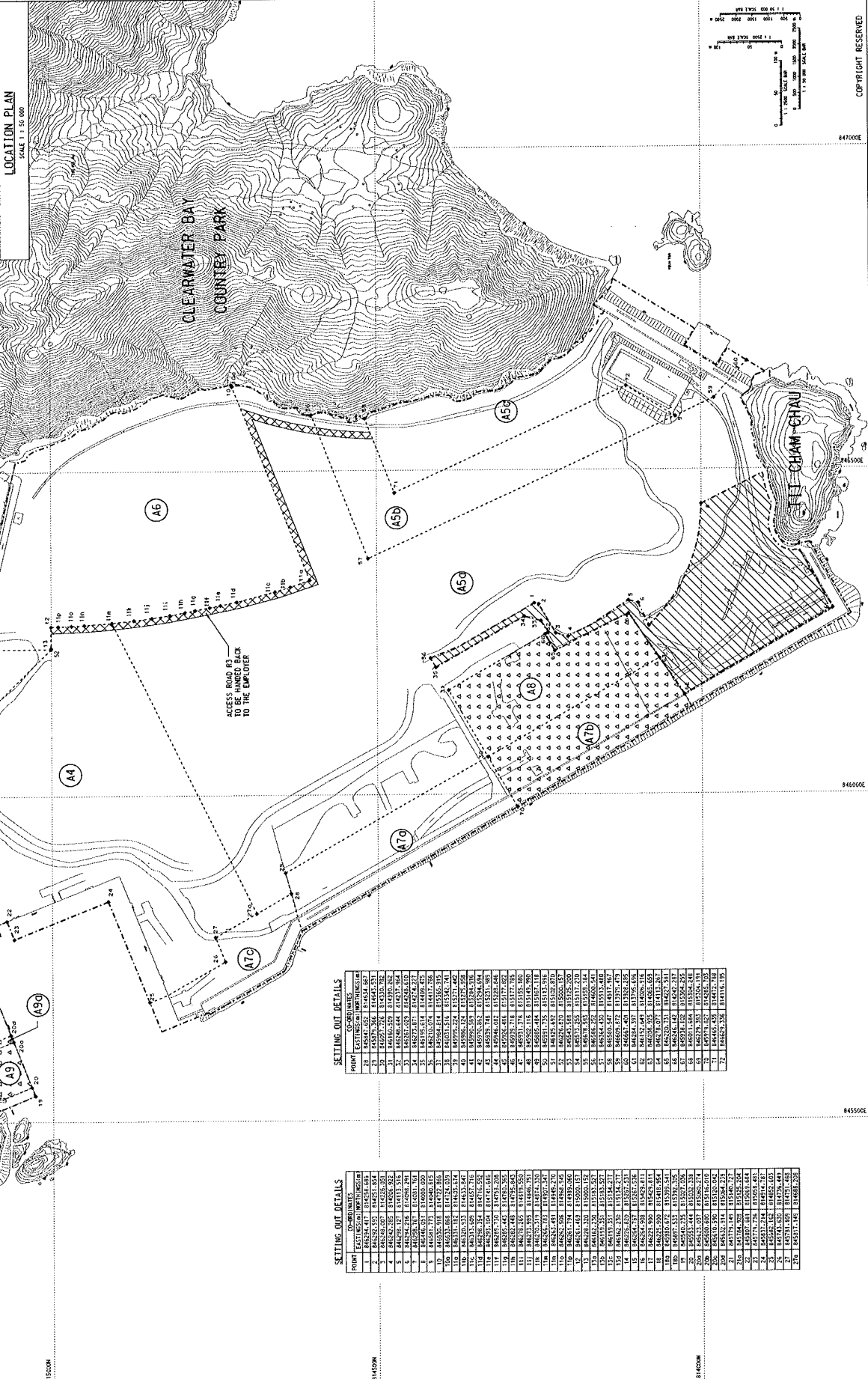
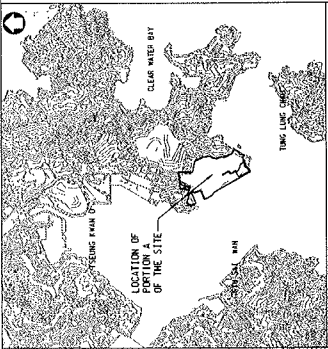
NOTES:  
 1. ALL COORDINATES REFER TO WORKING  
 GEODESIC COORDINATES AND NOT THE  
 2. DRAWING FILED AS IS IN THE OFFICE.

LEGEND:  
 --- SITE BOUNDARY  
 --- PORTION BOUNDARY  
 --- (INDICATIVE ONLY)  
 (A2) PORTION A2 OF THE PORTION  
 (A2, A3, A3B, A3C) PORTION OF SITE BEING OCCUPIED BY OTHERS OR TO BE HANDOVER TO THE CONTRACTOR IF INSTRUCTED BY THE EMPLOYER  
 [Hatched] SITE OF THE EXISTING TEMPORARY CONSTRUCTION FACILITY TO BE USED BY OTHER CONTRACTORS

REV. NO.	DATE	DESCRIPTION	BY	CHECKED	DATE
1	14-10-2016	ISSUED FOR TENDERS	STANLEY	STANLEY	14-10-2016
2	14-10-2016	ISSUED FOR TENDERS	STANLEY	STANLEY	14-10-2016
3	14-10-2016	ISSUED FOR TENDERS	STANLEY	STANLEY	14-10-2016
4	14-10-2016	ISSUED FOR TENDERS	STANLEY	STANLEY	14-10-2016
5	14-10-2016	ISSUED FOR TENDERS	STANLEY	STANLEY	14-10-2016

DESIGNED BY: K. Y. TAM  
 DRAWN BY: K. Y. TAM  
 CHECKED BY: L. NG  
 APPROVED BY: [Signature]  
 DATE: 14-10-2016  
 CONTRACT NO.: CV/2016/07  
 PROJECT NO.:  
 DRAWING TITLE:  
 HANDLING OF SURPLUS PUBLIC FILL (2016-2018)

DRAWING NO.: FM10077-2-A  
 SCALE: 1:5000 AS SHOWN  
 OFFICE: FILL MANAGEMENT DIVISION CIVIL ENGINEERING OFFICE  
 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT



SETTING OUT DETAILS

POINT	COORDINATES
1	484524.47 141526.64
2	484525.53 141527.64
3	484526.59 141528.64
4	484527.65 141529.64
5	484528.71 141530.64
6	484529.77 141531.64
7	484530.83 141532.64
8	484531.89 141533.64
9	484532.95 141534.64
10	484534.01 141535.64
11	484535.07 141536.64
12	484536.13 141537.64
13	484537.19 141538.64
14	484538.25 141539.64
15	484539.31 141540.64
16	484540.37 141541.64
17	484541.43 141542.64
18	484542.49 141543.64
19	484543.55 141544.64
20	484544.61 141545.64
21	484545.67 141546.64
22	484546.73 141547.64
23	484547.79 141548.64
24	484548.85 141549.64
25	484549.91 141550.64
26	484550.97 141551.64
27	484552.03 141552.64
28	484553.09 141553.64
29	484554.15 141554.64
30	484555.21 141555.64
31	484556.27 141556.64
32	484557.33 141557.64
33	484558.39 141558.64
34	484559.45 141559.64
35	484560.51 141560.64
36	484561.57 141561.64
37	484562.63 141562.64
38	484563.69 141563.64
39	484564.75 141564.64
40	484565.81 141565.64
41	484566.87 141566.64
42	484567.93 141567.64
43	484568.99 141568.64
44	484570.05 141569.64
45	484571.11 141570.64
46	484572.17 141571.64
47	484573.23 141572.64
48	484574.29 141573.64
49	484575.35 141574.64
50	484576.41 141575.64
51	484577.47 141576.64
52	484578.53 141577.64
53	484579.59 141578.64
54	484580.65 141579.64
55	484581.71 141580.64
56	484582.77 141581.64
57	484583.83 141582.64
58	484584.89 141583.64
59	484585.95 141584.64
60	484587.01 141585.64
61	484588.07 141586.64
62	484589.13 141587.64
63	484590.19 141588.64
64	484591.25 141589.64
65	484592.31 141590.64
66	484593.37 141591.64
67	484594.43 141592.64
68	484595.49 141593.64
69	484596.55 141594.64
70	484597.61 141595.64
71	484598.67 141596.64
72	484599.73 141597.64
73	484600.79 141598.64
74	484601.85 141599.64
75	484602.91 141600.64
76	484603.97 141601.64
77	484605.03 141602.64
78	484606.09 141603.64
79	484607.15 141604.64
80	484608.21 141605.64
81	484609.27 141606.64
82	484610.33 141607.64
83	484611.39 141608.64
84	484612.45 141609.64
85	484613.51 141610.64
86	484614.57 141611.64
87	484615.63 141612.64
88	484616.69 141613.64
89	484617.75 141614.64
90	484618.81 141615.64
91	484619.87 141616.64
92	484620.93 141617.64
93	484621.99 141618.64
94	484623.05 141619.64
95	484624.11 141620.64
96	484625.17 141621.64
97	484626.23 141622.64
98	484627.29 141623.64
99	484628.35 141624.64
100	484629.41 141625.64

SETTING OUT DETAILS

POINT	COORDINATES
101	484630.47 141626.64
102	484631.53 141627.64
103	484632.59 141628.64
104	484633.65 141629.64
105	484634.71 141630.64
106	484635.77 141631.64
107	484636.83 141632.64
108	484637.89 141633.64
109	484638.95 141634.64
110	484640.01 141635.64
111	484641.07 141636.64
112	484642.13 141637.64
113	484643.19 141638.64
114	484644.25 141639.64
115	484645.31 141640.64
116	484646.37 141641.64
117	484647.43 141642.64
118	484648.49 141643.64
119	484649.55 141644.64
120	484650.61 141645.64
121	484651.67 141646.64
122	484652.73 141647.64
123	484653.79 141648.64
124	484654.85 141649.64
125	484655.91 141650.64
126	484656.97 141651.64
127	484658.03 141652.64
128	484659.09 141653.64
129	484660.15 141654.64
130	484661.21 141655.64
131	484662.27 141656.64
132	484663.33 141657.64
133	484664.39 141658.64
134	484665.45 141659.64
135	484666.51 141660.64
136	484667.57 141661.64
137	484668.63 141662.64
138	484669.69 141663.64
139	484670.75 141664.64
140	484671.81 141665.64
141	484672.87 141666.64
142	484673.93 141667.64
143	484674.99 141668.64
144	484676.05 141669.64
145	484677.11 141670.64
146	484678.17 141671.64
147	484679.23 141672.64
148	484680.29 141673.64
149	484681.35 141674.64
150	484682.41 141675.64
151	484683.47 141676.64
152	484684.53 141677.64
153	484685.59 141678.64
154	484686.65 141679.64
155	484687.71 141680.64
156	484688.77 141681.64
157	484689.83 141682.64
158	484690.89 141683.64
159	484691.95 141684.64
160	484693.01 141685.64
161	484694.07 141686.64
162	484695.13 141687.64
163	484696.19 141688.64
164	484697.25 141689.64
165	484698.31 141690.64
166	484699.37 141691.64
167	484700.43 141692.64
168	484701.49 141693.64
169	484702.55 141694.64
170	484703.61 141695.64
171	484704.67 141696.64
172	484705.73 141697.64
173	484706.79 141698.64
174	484707.85 141699.64
175	484708.91 141700.64
176	484710.03 141701.64
177	484711.09 141702.64
178	484712.15 141703.64
179	484713.21 141704.64
180	484714.27 141705.64
181	484715.33 141706.64
182	484716.39 141707.64
183	484717.45 141708.64
184	484718.51 141709.64
185	484719.57 141710.64
186	484720.63 141711.64
187	484721.69 141712.64
188	484722.75 141713.64
189	484723.81 141714.64
190	484724.87 141715.64
191	484725.93 141716.64
192	484726.99 141717.64
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194	484729.11 141719.64
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847000E  
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 844000E  
 0 100 200 300 400 500 600 700 800 900 1000  
 0 100 200 300 400 500 600 700 800 900 1000  
 1:5000 AS SHOWN  
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## **Appendix K**

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

**Contract No. CV/2015/07 Handling of Surplus Public Fill (2016-2018)**
**Tseung Kwan O Area 137**

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

**August 2017**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31 <b>1-hr TSP x 2</b> <b>WQM</b> Mid-flood (12:00 -13:00) Mid-ebb (18:00 -19:00)	1 / 8	2 <b>1-hr TSP</b> <b>Weekly SI (pm)</b> <b>WQM</b> Mid-ebb (08:45 -09:45) Mid-flood (15:30 -16:30)	3	4 <b>1-hr TSP</b> <b>24 hr TSP</b> <b>24-hr RSP</b> <b>WQM</b> Mid-ebb (10:00 -11:00) Mid-flood (17:00 -18:00)	5
6	7 <b>1-hr TSP</b> <b>WQM</b> Mid-ebb (11:30 -12:30) Mid-flood (18:45 -19:45)	8	9 <b>1-hr TSP</b> <b>Weekly SI (pm)</b> <b>WQM</b> Mid-ebb (13:00 -14:00) Mid-flood (19:30 -20:30)	10 <b>24 hr TSP</b> <b>24-hr RSP</b>	11 <b>1-hr TSP x 2</b> <b>WQM</b> Mid-flood (08:00 -09:00) Mid-ebb (14:00 -15:00)	12
13	14 <b>1-hr TSP</b> <b>WQM</b> Mid-flood (10:00 -11:00) Mid-ebb (16:00 -17:00)	15	16 <b>1-hr TSP</b> <b>24 hr TSP</b> <b>24-hr RSP</b> <b>Weekly SI (pm)</b> <b>WQM</b> Mid-flood (13:00 -14:00) Mid-ebb (18:30 -19:30)	17	18 <b>1-hr TSP</b> <b>WQM</b> Mid-ebb (09:00 -10:00) Mid-flood (16:00 -17:00)	19
20	21 <b>1-hr TSP</b> <b>WQM</b> Mid-ebb (11:30 -12:30) Mid-flood (18:00 -19:00)	22 <b>24 hr TSP</b> <b>24-hr RSP</b>	23 <b>1-hr TSP x 2</b> <b>NM</b> <b>Weekly SI (pm)</b> <b>WQM</b> Mid-ebb (13:00 -14:00) Mid-flood (19:00 -20:00)	24	25 <b>1-hr TSP</b> <b>WQM</b> Mid-flood (08:00 -09:00) Mid-ebb (14:00 -15:00)	26
27	28 <b>1-hr TSP</b> <b>24 hr TSP</b> <b>24-hr RSP</b> <b>WQM</b> Mid-flood (10:00 -11:00) Mid-ebb (16:00 -17:00)	29	30 <b>1-hr TSP</b> <b>Weekly SI (pm)</b> <b>WQM</b> Mid-flood (14:00 -15:00) Mid-ebb (18:30 -19:30)	31	1 / 9 <b>1-hr TSP</b> <b>WQM</b> Mid-ebb (08:30 -09:30) Mid-flood (16:30 -17:30)	2 <b>24 hr TSP</b> <b>24-hr RSP</b>

## **Appendix L**

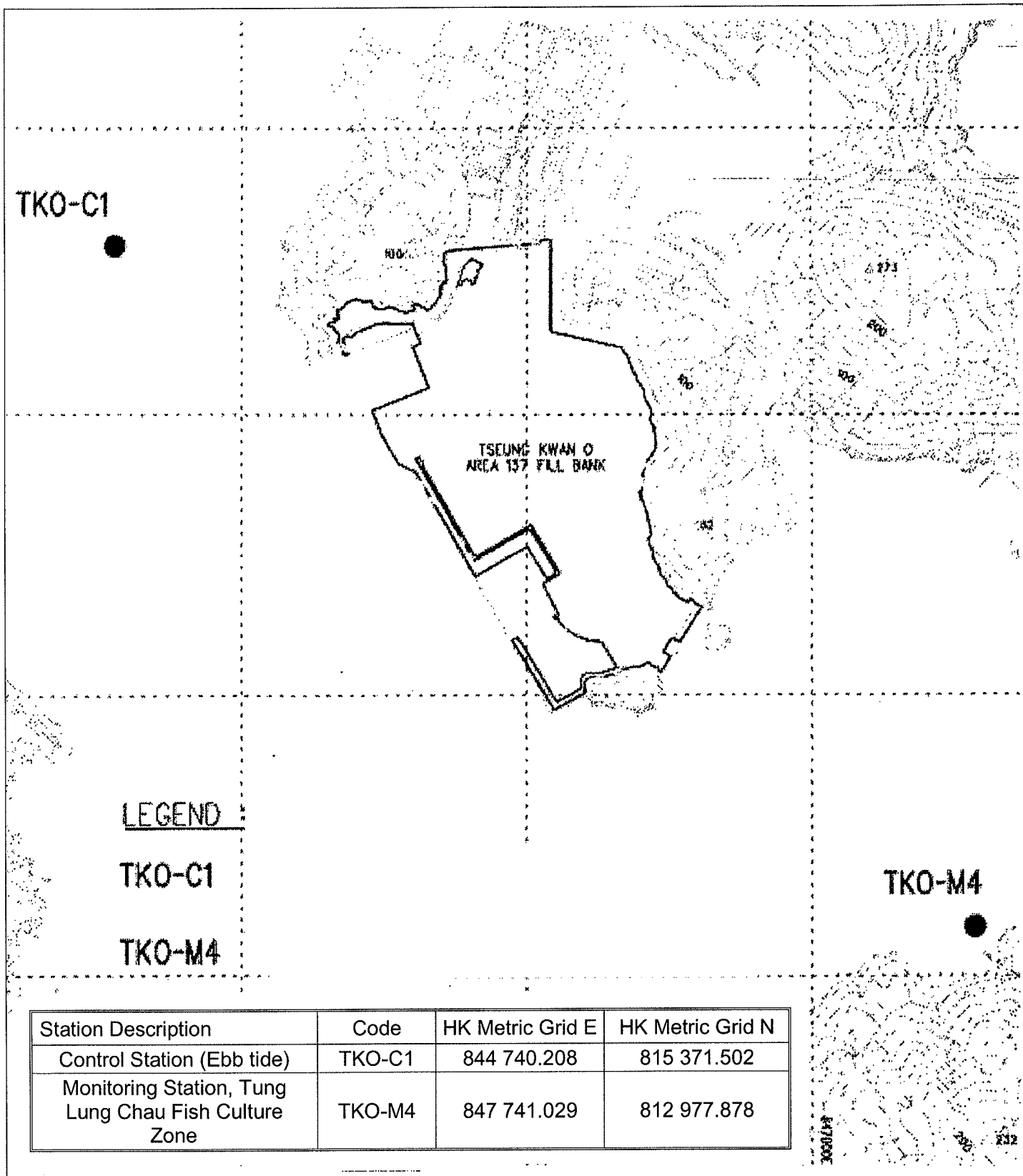
### **Complaint Log**

## Complaint Logs

Log Ref.	Location	Received Date	Details of Complaint	Investigation / Mitigation Action	Status
001	Barge handling area (BHA) at Tseung Kwan O 137	15 May 2017	One complaint received on 15 May 2017, which was forwarded to ET on 11 August 2017, from CEDD (Complaint NCF-N08/RE/00014875-17 Sent By CSO[RN]3 [CASE#2-3943858817 Int.Comm. - WS170513A57354] against illegal dumping at sea without permit in TKO137 fill bank.	Refer to the ET site investigation on 14 August 2017, the contractor clarified that the contractor conducted vessel loading test at Tseung Kwan O 137 Fill bank on 13 May 2017 and the material was then unloaded from the vessels. The contractor started to dump fill materials from 19 May 2017 after receiving the valid dumping permit.	---



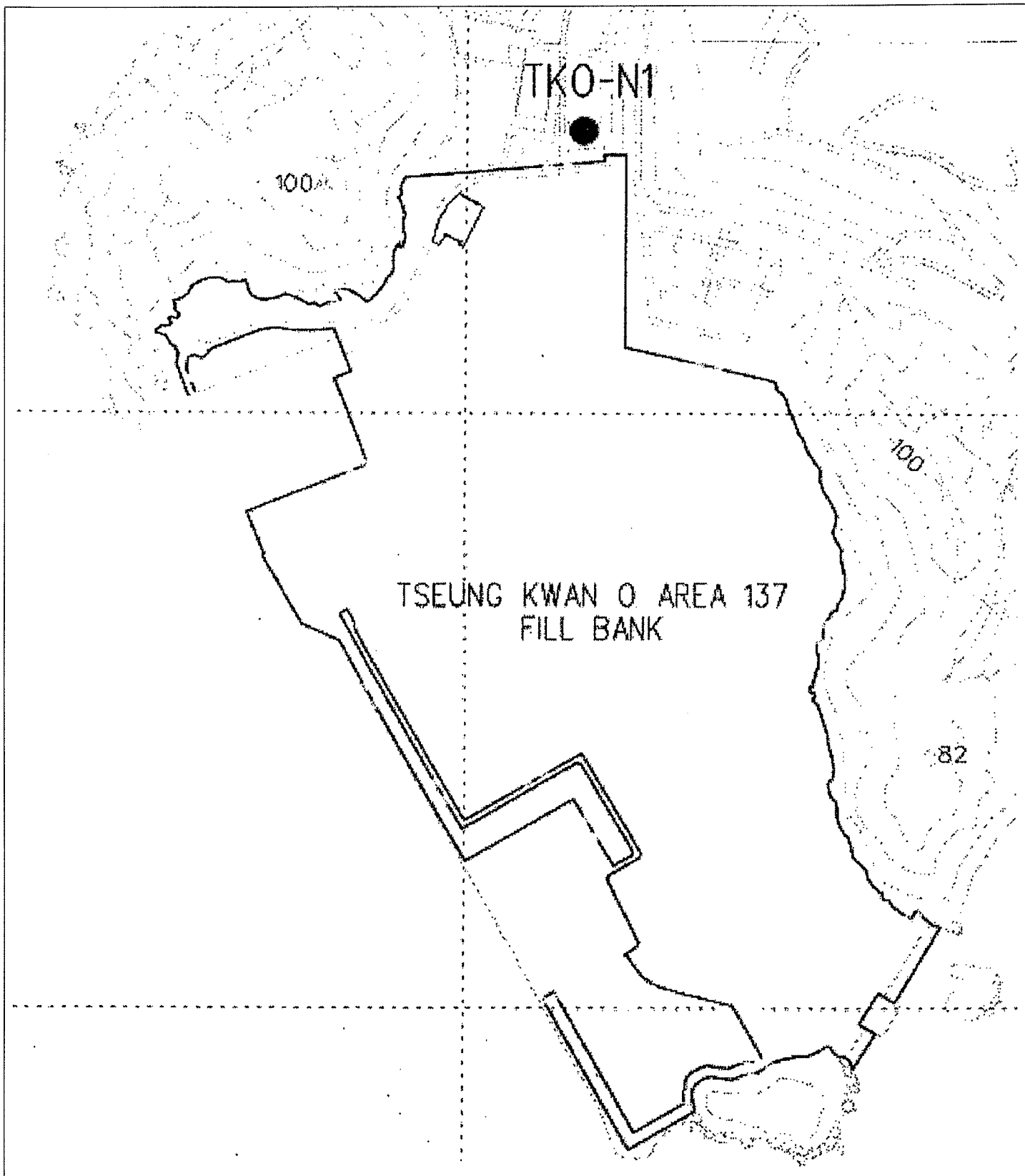
## Figures



Contract No. CV/2015/07  
 Handling of Surplus Public Fill (2016-2018)

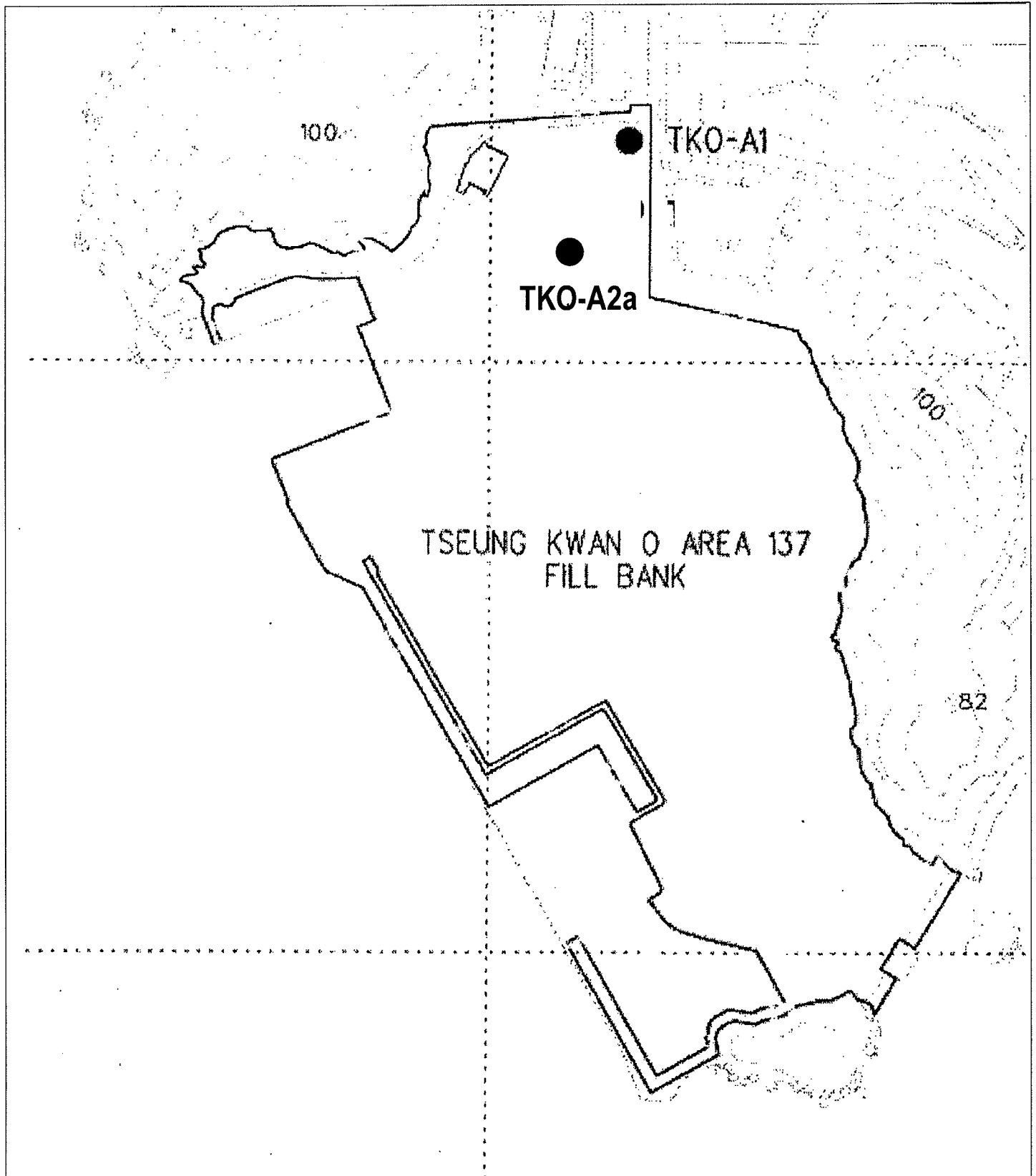
Figure 1  
 Locations of Water Quality Monitoring Stations –  
 Tseung Kwan O Area 137 Fill Bank





Contract No. CV/2015/07  
 Handling of Surplus Public Fill (2016-2018)

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



Contract No. CV/2015/07  
Handling of Surplus Public Fill (2016-2018)

Figure 3  
Locations of Air Quality Monitoring Stations –  
Tseung Kwan O Area 137 Fill Bank



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