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HKPFH Joint Venture

***Contract No.: CV/2013/06
Handling of Surplus Public Fill
(2014-2016)***

TUEN MUN AREA 38 FILL BANK

MONTHLY EM&A REPORT NO.15

(MARCH 2015)

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17 April 2015

By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited
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Fo Tan, Hong Kong

Attention: Mr. C L Lau

Dear Mr. Lau,


**Re: Contract No. CV/2013/06
Handling of Surplus Public Fill (2014 – 2016)
Monthly EM&A Report (No. 15) for March 2015 for the Tuen Mun Area 38 Fill
Bank**

Reference is made to your submission of the draft Monthly EM&A Report for March 2015 for the TM Area 38 Fill Bank received by E-mail on 16 April 2015 and the subsequent revision on 17 April 2015.

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

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

Yours sincerely,



Tony Cheng
Independent Environmental Checker

c.c. CEDD Attn: Mr. Terry Chock / Mr. Louis Chan / Mr. Simon Leung Fax No.: 2714 0113
HKPFHJV Attn: Mr. Eric Wan Fax No.: 2744 6937

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EXECUTIVE SUMMARY

This monthly Environmental Monitoring and Audit (EM&A) report No.15 was prepared by Environmental Team (ET) of ETS-Testconsult Ltd (ETL) for the "Contract No. CV/2013/06 Handling of Surplus Public Fill (2014-2016) – Tuen Mun (TM) Area 38 Fill Bank" (The Project).

This report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at TM Area 38 in March 2015.

Site Activities

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

1. Operation of the TM38 Fill Bank
2. Transferring public fill to vessel and delivering to Taishan and other parties
3. Repairing of the damaged cladding of tipping hall
4. Construction of New Tipping Hall
5. Repairing of Wheel Wash Facility B3
6. Construction of new recording house at B6

Environmental Monitoring Progress

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

- 24-hour TSP Monitoring: 6 Occasions at 2 designated locations
- 1-hour TSP Monitoring: 16 Occasions at 2 designated locations
- Noise, Daytime: 9 Occasions at 2 designated locations
- Marine Water Quality Monitoring: 13 Occasions at 4 designated locations
- Weekly-site inspection: 4 Occasions

Air Monitoring

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

Noise Monitoring

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

Marine Water Quality Monitoring

No exceedance of action and limit level was recorded in the reporting month.

Weekly Site Inspection

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

Environmental Complaints, Notification of summons and successful prosecutions

No complaint, notification of summon and prosecution with respect to environmental issues was received in this monitoring month.

Future Key Issues

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

- Dust generation from activities on site, such as vehicular movements along unpaved area and rock crushing activities;
- Noise impact from operating equipment and machinery on site;
- Wastewater and surface runoff from the site discharged into nearby water body; and
- Storage and usage of chemicals / fuel and chemical waste / waste oil.

1.0 INTRODUCTION

HKPFH Joint Venture (HKPFH-JV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the “Contract No: CV/2013/06 – Handling of Surplus Public Fill (2014-2016) – Tuen Mun (TM) Area 38 Fill Bank” (The Project).

In accordance with the Condition 5 of Part C of Environmental Permit (No.: EP-210/2005/B) (the EP), an EM&A programme as set out in the Project Profile should be implemented.

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

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event/Action Plans;
- Environmental mitigation measures, as recommended in the Project Profile; and
- Environmental requirements in contract documents.

Baseline monitoring was completed in May 2003 by Stanger Asia Ltd. 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 Tuen Mun Area 38 in March 2015.

2.0 PROJECT INFORMATION

2.1 Construction Programme

Details of construction programme are shown in Appendix G.

2.2 Project Organization and Management Structure

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

2.3 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, Terry Chock, Louis Chan, W F Cheung, Panda Liu, Samson Kwong	Engineer's Representative	2762 5555	2714 0113
IEC (ENVIRON)	Tony Cheng	IEC	3465 2888	3465 2899
Contractor (HKPFH-JV)	K W Li	Project Manager	9750 6438	2744 6937
ET (ETL)	C. L. Lau	ET Leader	2946 7791	2695 3944



3.0 CONSTRUCTION PROGRESS IN THIS REPORTING MONTH

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

1. Operation of the TM38 Fill Bank
2. Transferring public fill to vessel and delivering to Taishan and other parties
3. Repairing of the damaged cladding of tipping hall
4. Construction of New Tipping Hall
5. Repairing of Wheel Wash Facility B3.
6. Construction of new recording house at B6

4.0 AIR QUALITY MONITORING

4.1 Monitoring Requirement

1-hr and 24-hr TSP levels were monitored in the reporting month. Table 4.3 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. Copies of the calibration certificates for the HVS and calibrator are attached in Appendix B1.

Table 4.1 Air Quality Monitoring Equipment

<i>Equipment</i>	<i>Model and Make</i>
<i>HVS</i>	<i>Greasby GMWS2310</i>
<i>Calibrator</i>	<i>Tisch TE-5025A</i>

4.3 Monitoring Parameters, Frequency and Duration

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

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

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

4.4 Monitoring Locations and Schedule

In accordance with the Project Profile, two air-quality monitoring stations, namely TM-A1 and TM-A2, were selected for the 1-hr TSP and 24-hr TSP sampling.

Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at an alternative air monitoring station TM-RA2 (refer to Figure 1 attached) from 28 October 2008.

The locations of monitoring stations are shown in Figure 1.

During the reporting month, 1-hr and 24-hr TSP monitoring were carried out as the schedule. The details for 24-hr and 1-hr TSP monitoring carried out in this reporting month are summarized in Appendix B2.



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 Appendix D2 “General Technical Requirements of Environmental Monitoring” in the Environmental Monitoring and Audit Guidelines for Development Projects in Hong Kong published by EPD.

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 0.6m³/min and 1.7m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. The flow rate is indicated on the flow rate chart.
- For TSP sampling, fiberglass filters (GA-55) were used.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated 5 minutes to establish thermal equilibrium before placing any filter media at designated air monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holder frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The programmable timer will be set for a sampling period of 1 hour / 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 recorded.
- 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%.

Maintenance & Calibration

- The 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 included wind speed and wind direction were directly extracted from Tuen Mun Station of Hong Kong Observatory during this reporting month. The wind data are presented in Appendix E.

4.6 Action and Limit Levels

Table 4.3 shows the Action and Limit levels for 24-hr TSP and 1-hr TSP monitoring.



Table 4.3 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
TM-A1	192	260	344	500
TM-RA2 *	192	260	344	500

Remark (*): Since the area for existing air monitoring station TM-A2 near Tipping Hall No.1 was handed over to EcoPark, air monitoring station TM-A2 was cancelled and the air monitoring was carried out at an alternative air monitoring station TM-RA2 from 28 October 2008. Since dust monitoring stations TM-A2 and TM-RA2 are located close to the major dust emission sources and no significant difference between them on the prevailing meteorological conditions, the baseline data from TM-A2 can also be valid in the case of TM-RA2.

4.7 Event-Action Plans

Please refer to Appendix F for details.

4.8 Results and Observations

All monitoring data of both 1-hr and 24-hr TSP monitoring is provided in Appendix B2. Graphical presentation of 1-hr and 24-hr TSP monitoring results for the reporting month is shown in Appendix B3. Wind data, including wind speed and wind direction, are annexed in Appendix E.

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

Generally, the Contractor implemented sufficient dust mitigation measures, including operation of wheel washing facilities and road dampening by water bowzers on the main haul roads and unpaved areas.

5.0 MARINE WATER QUALITY MONITORING

5.1 Monitoring Requirements

In accordance with the Project Profile, 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 two control monitoring stations (TM-FC1 and TM-FC2) and two impact monitoring stations (TM-FM1 and TM-FM2).

5.2 Monitoring Locations

As stipulated in the EM&A requirement, there were four monitoring stations undertaken during the impact monitoring. Figure 2 shows the locations of the marine water quality monitoring stations.

5.3 Monitoring Parameters and Frequency

Monitoring of the marine water quality parameters and frequency are listed in Table 5.1.

Table 5.1 Monitoring Parameters and Frequency of the marine water

Monitoring Station	Parameter	Frequency	No. of Depths
Control Stations: TM-FC1 (Mid-ebb) and TM-FC2 (Mid-flood) Impact Stations: TM-FM1 and TM-FM2	Depth (m)	3 days/week, 2 tides/day	3 (Surface, mid- depth & bottom)
	Temperature ($^{\circ}\text{C}$)		
	Dissolved Oxygen (mg/L and % saturation)		
	Turbidity (NTU)		
	Salinity (ppt)		
	Suspended solids (mg/L)		

5.4 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. At each sampling depth, duplicate readings of dissolved oxygen content and turbidity were taken. The probes were retrieved out of the water after first measurement and then redeployed for the second measurement. The difference between the two readings of each set was more than 25% of the value of the first reading while a third measurement would be conducted to ensure data precision.

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, labeled 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 5.2. For the QA/QC procedures, one QC sample, one duplicate sample and one sample spike of every batch of 20 samples were analysis. The QA/QC results are summarized in Appendix K.

Table 5.2 Summary of testing procedure

Laboratory Analysis	Testing Procedure	Detection Limit
Total suspended solids	In house method based on APHA 19 th 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, measurements were conducted three days per week at both mid-ebb and mid-flood tides at three depths (i.e. 1m below surface, mid depth and 1m from seabed). 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 to be carried out.

Table 5.3 shows the equipment used for in-situ monitoring of water quality. The calibration certificates are attached in Appendix C1.

Table 5.3 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 Pro 2030	17/12/14 17/03/15	16/03/15 16/06/15	ET/EW/008/006 *
Turbidity	HACH Model 2100Q Turbid Meter	05/01/15	04/04/15	ET/0505/011 *
Water Depth	Speedtech SM-5	-----	-----	ET/EW/002/06

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

5.5 Action and Limit Levels

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

Table 5.4 Water Quality Action and Limit Levels

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface & Middle</u> <4.78 mg/L (5%-ile of baseline data) <u>Bottom</u> <4.16 mg/L (5%-ile of baseline data)	<u>Surface & Middle</u> <4.00 mg/L (1%-ile of baseline data) <u>Bottom</u> <2.00 mg/L
SS (mg/L) (Depth-averaged)	>120% of the upstream control station's SS at the same tide on the same day	>130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>120% of the upstream control station's turbidity at the same tide on the same day	>130% of the upstream control station's turbidity at the same tide on the same day



5.6 Event and Action Plan

Please refer to the Appendix F for details.

5.7 Monitoring Duration and Period in this reporting month

Table 5.5 is the time schedule for the marine water quality monitoring events that were conducted in this reporting period. Duration of marine water quality monitoring is detailed in Appendix C2.

Table 5.5 Time Schedule of Marine Water Quality Monitoring

March 2015						
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

5.8 Marine Water Quality Monitoring Results

The impact water quality measurement results are detailed in Appendix C2. Appendix C3 presents the water quality monitoring data and graphical presentations of monitoring results respectively.

The summary of marine water quality exceedances is shown in Table 5.6.

Table 5.6 Summary of Marine Water Quality Exceedances in this reporting month

Tide	Station	Exceedance Level	DO		Turbidity	SS	Total
			Surface & Middle	Bottom			
Mid-Ebb	TM-FM1	Action	0	0	0	0	0
		Limit	0	0	0	0	0
	TM-FM2	Action	0	0	0	0	0
		Limit	0	0	0	0	0
Mid-Flood	TM-FM1	Action	0	0	0	0	0
		Limit	0	0	0	0	0
	TM-FM2	Action	0	0	0	0	0
		Limit	0	0	0	0	0
Total		Action	0	0	0	0	0
		Limit	0	0	0	0	0

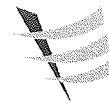
According to the summary of marine water monitoring results, no exceedance of action and limit level was recorded in this reporting month.

6.0 Noise Monitoring

6.1 Monitoring Requirements

Noise monitoring was conducted at 2 designated monitoring stations as specified in the Sections 26.10 to 26.12 of the Particular Specification for good site practice.

The equipment, parameter, frequency, duration, methodology, calibration details, results and observations of the noise monitoring for the reporting month are presented in this section.



6.2 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 6.1 summarizes noise monitoring equipment model being used. A copy of the calibration certificate for noise meter and calibrator are attached in Appendix D1.

Table 6.1 Noise Monitoring Equipment

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

6.3 Monitoring Parameters, Duration and Frequency

Duration, frequencies and parameters of noise measurement are presented in Table 6.2.

Table 6.2 Duration, Frequencies and Parameters of Noise Monitoring

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

6.4 Monitoring Locations and Period

Since Lands Dept did not approve to carry out noise monitoring at their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring carried out at two noise monitoring stations TM-RN1 and TM-RN2 (refer to the figure 3 attached) from 18 December 2007.

The noise monitoring locations, TM-RN1 and TM-RN2 are shown in Figure 3. The noise measurement at TM-RN1 and TM-RN2 are façade measurement.

The noise-monitoring period of monitoring stations is summarized in Appendix D2.

6.5 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 min
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000HZ. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with a portable wind meter.
- During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Free Field correction to the measurements should be made. 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.

6.6 Action and Limit Levels

The Action and Limit levels for noise levels derived as illustrated in Table 6.3.

Table 6.3 Action and Limit Levels for noise monitoring

Time Period	Action *	Limit *
0700-1900 hrs on normal weekdays	When one documented complaint is received	65 dB(A)

6.7 Event-Action Plans

Please refer to the Appendix F for details.

6.8 Results and Observation

The detail of the noise monitoring is provided in Appendix D2. Graphical presentation of the monitoring result for the reporting month is shown in Appendix D3.

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

The major sources of noise pollution observed in this reporting month were noise from the traveling dump trucks and from the operation of site machines.

7.0 ENVIRONMENTAL AUDIT

7.1 Weekly ET Site Inspection

Weekly site inspections were carried out by ET to monitor the timely implementation of proper environmental pollution control and mitigation measures for the Project. In this reporting month, four weekly site inspections were conducted on 05, 12, 19 and 24 March 2015. Summaries of key findings of weekly ET site inspections in this month are described in Table 7.1.

Table 7.1 Key Findings of Weekly ET Site Inspections in this reporting month

Date	Key Findings	Action(s) Taken recommended by ET	Action(s) Taken by the Contractor during the site audit	Rectification Status by ET
05 March 2015	No defective or observation was recorded during the weekly site inspection.			
12 March 2015	No defective or observation was recorded during the weekly site inspection.			
19 March 2015	No defective or observation was recorded during the weekly site inspection.			
24 March 2015	No defective or observation was recorded during the weekly site inspection.			

7.2 Review of Environmental Monitoring Procedures

The monitoring works conducted by the ET were inspected internally on a regular basis. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

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

Water Quality Monitoring

- The monitoring team recorded the observations around the monitoring stations, which might affect the results; and
- Major water pollution sources were identified and recorded.

Noise Monitoring

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

7.3 Status of Environmental Licensing and Permitting

All permits/licenses valid in this reporting month are summarized in Table 7.2.

Table 7.2 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-210/2005/B	08/04/13	---	Issued
Marine Dumping Permit	EP/MD/15-177	01/01/15	31/03/15	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
Marine Dumping Permit	EP/MD/15-241	01/01/15	31/03/15	Approval for dumping 3,900,000 tons (approximately equal to 2,166,667 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
Chemical Waste Producer	5296-421-H3555-01	21/01/14	---	Spent battery containing heavy metals and spent lubricating oil
Effluent Discharge License	WT00018973-2014	23/05/14	31/05/19	Discharge of Industrial Trade Effluent arising from public fill reception facilities, screen and sedimentation tank
Billing Account for Waste Disposal	7018998	---	---	---

7.4 Implementation Status

7.4.1 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.

7.4.2 Implementation Status of Event and Action Plan

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month. Apart from this, there was no exceedance on noise recorded in this month.

According to the marine water monitoring results, no action-level and limit-level exceedance was recorded in this reporting month.

Hence, no further action was required to be implemented.

7.4.3 Implementation Status of Environmental Complaint, Notification of Summon and Successful Prosecution Handling

No complaint, notification of summon and prosecution with respect to environmental issues was received in this monitoring month.

A summary of environmental complaints, notifications of summons and successful prosecutions was given in Table 7.3.

Table 7.3 Summary of Environmental Complaints and Prosecutions

Complaints logged		Summons served		Successful Prosecution	
March 2015	Cumulative	March 2015	Cumulative	March 2015	Cumulative
0	0	0	0	0	0

8.0 LANDSCAPE AND VISUAL

Landscape and visual site audit was carried out on a weekly basis to monitor environmental issues in order to ensure that all mitigation measures were implemented timely and properly. The findings in this reporting month were:

- The maximum stockpiling height at the Fill Bank was limited to a maximum of +40 mPD;
- The Contractor hydroseeded the outer slopes of the Fill Bank as far as practicable;
- The Contractor removed the stockpile of public fill in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable; and
- Lighting was set to minimize night-time glare.

9.0 WASTE MANAGEMENT

9.1 Summary of Waste disposed of in this month

The actual amounts of different types of waste disposed of by the activities of the Project in the month are shown in Table 9.1

Table 9.1 Actual amounts of Waste generated in this reporting month

Waste Type	Actual Amount	Disposal Locations
Public Fill (m ³)	0	Tuen Mun 38 Fill Bank
C&D Waste (general refuse) (kg)	0	WENT Landfill
Chemical Waste (kg/L)	0	Collected by licensed collector

9.2 Advice on the Solid and Liquid Waste Management Status

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.

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 should be 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 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.

10.0 ENVIRONMENTAL NON-CONFORMANCE

10.1 Summary of air quality, noise and marine water quality

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

According to the marine water monitoring results, no action-level and limit-level exceedance was recorded in the reporting month.

The noise level measured at the monitoring station complied with the Limit Level of 65dB(A). No complaint was received regarding noise issue in this reporting month.

10.2 Summary of Environmental Complaints

No complaint was occurred in this reporting month.

10.3 Summary of Notification of Summons and Prosecution

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

11.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Impact monitoring of air quality, noise and water quality were carried out at designated locations in this reporting month.

According to the summary of air monitoring results, no exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

According to the marine water monitoring results, no action-level and limit-level exceedance was recorded in the reporting month.

The noise level measured at the monitoring station complied with the Limit Level of 65dB(A). No complaint was received regarding noise issue in this reporting month.

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

No complaint, prosecution or notification of summons was received in this reporting month.

Recommendations

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

Air Quality

- Ensure the frequency of water spraying on haul roads, unloading areas and stockpiles to be sufficient to suppress the dust sources;
- Provide proper maintenance for the powered mechanical equipment and barges to avoid emission of dark smoke;
- Provide water spraying onto the truckloads during inspection of fill material;
- Conduct road sweeping on all paved haul roads and public roads especially outside and near the site egress by the road sweeper. Undertake water spraying on stockpiling area by water 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 construction 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 and permanent desilting chambers regularly; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

Chemical and Waste Management

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

Landscape and Visual

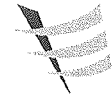
- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding/chaining fences in accordance with agreed design at proper location; and
- Maintain the hydroseeded slopes properly.

12.0 FUTURE KEY ISSUES

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

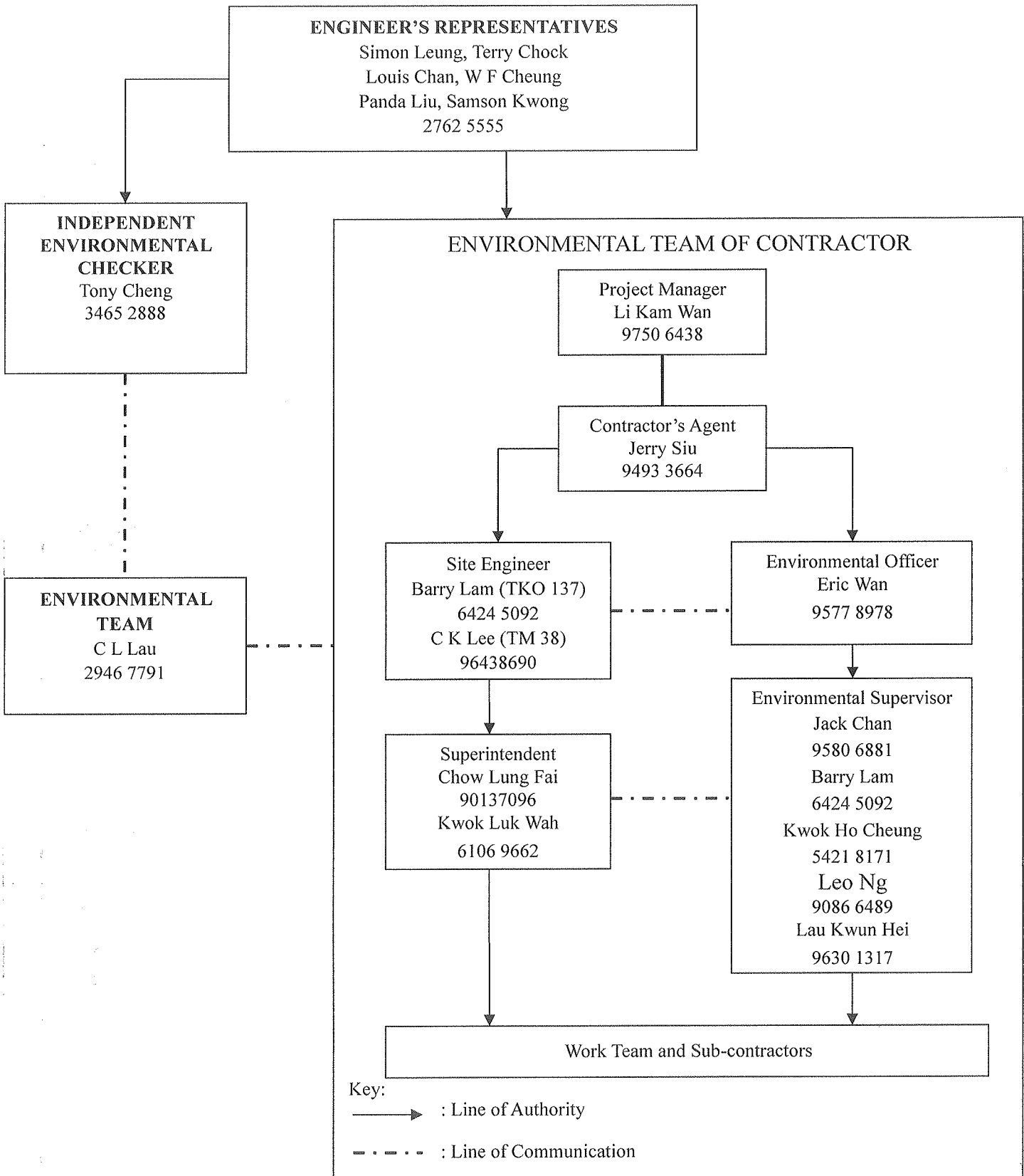
- Dust generation from activities on site, such as vehicular movements along unpaved area and rock crushing activities;
- Noise impact from operating equipment and machinery on site and
- Wastewater and surface runoff from the site discharged into nearby water body.

- END OF REPORT -



Appendix A

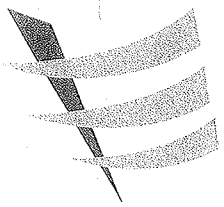
Project Organization Chart





Appendix B1

Calibration Certificates for Impact Air Quality Monitoring Equipments



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

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

Tel : 2695 8318

E-mail : etl@ets-testconsult.com

Fax : 2695 3944

Web site : www.ets-testconsult.com

Calibration Report
of
High Volume Air Sampler

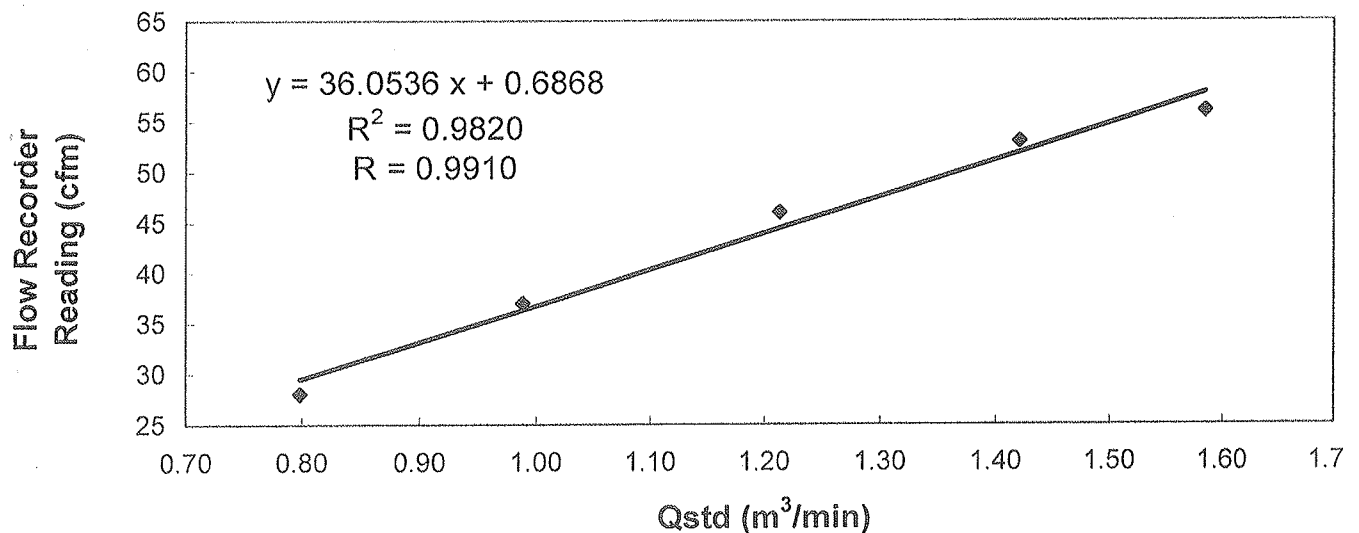
Manufacturer : Graseby GMW Date of Calibration : 03 January 2015

Serial No. : 10347 (ET / EA / 003 / 06) Calibration Due Date : 02 March 2015

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual


Results	Flow recorder reading (cfm)	56	53	46	37	28
	Qstd (Actual flow rate, m ³ /min)	1.59	1.42	1.21	0.99	0.80
	Pressure : 765.06 mm Hg	Temp. : 288 K				


Sampler 10347 Calibration Curve
Site: Tuen Mun 38 (TM-A1)

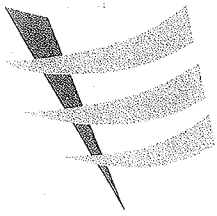


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

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

Calibrated by : 
TANG, Chung Hang
(Assistant Supervisor)

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



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

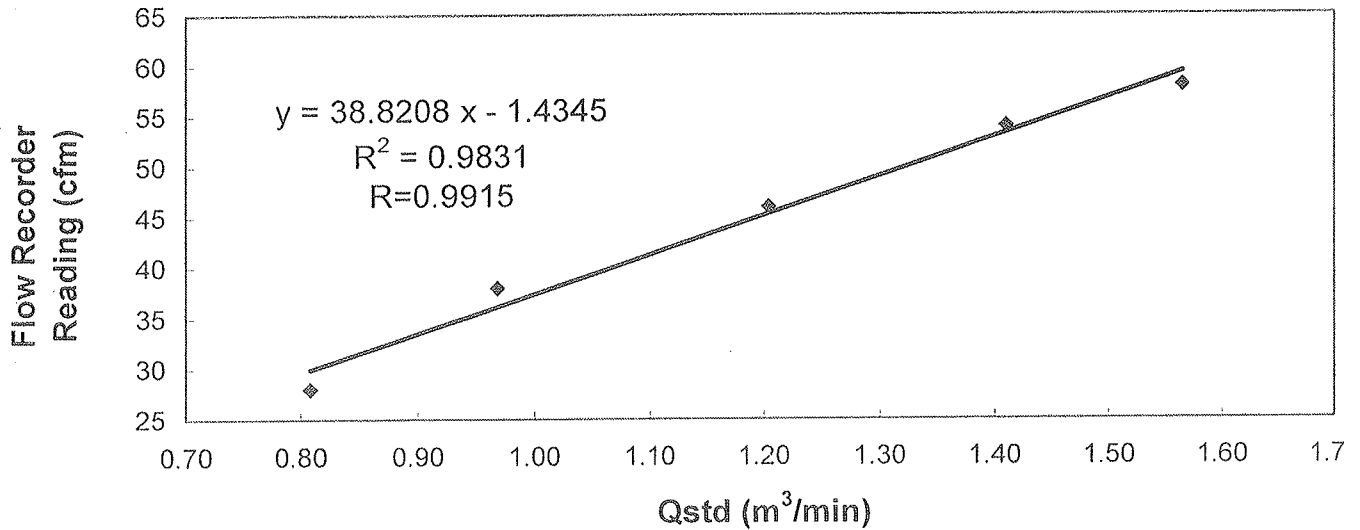
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
Tel : 2695 8318 E-mail : etl@ets-testconsult.com
Fax : 2695 3944 Web site : www.ets-testconsult.com

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW Date of Calibration : 03 March 2015
Serial No. : 10347 (ET / EA / 003 / 06) Calibration Due Date : 02 May 2015
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results	Flow recorder reading (cfm)	58	54	46	38	28
	Qstd (Actual flow rate, m ³ /min)	1.56	1.41	1.20	0.97	0.81
	Pressure :	763.56 mm Hg		Temp. :	292 K	

Sampler 10347 Calibration Curve
Site: Tuen Mun 38 (TM-A1)

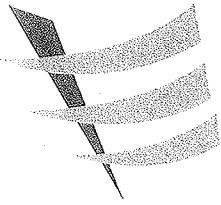


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

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

Calibrated by :
KWAN, King Ming
(Senior Technician)

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



東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

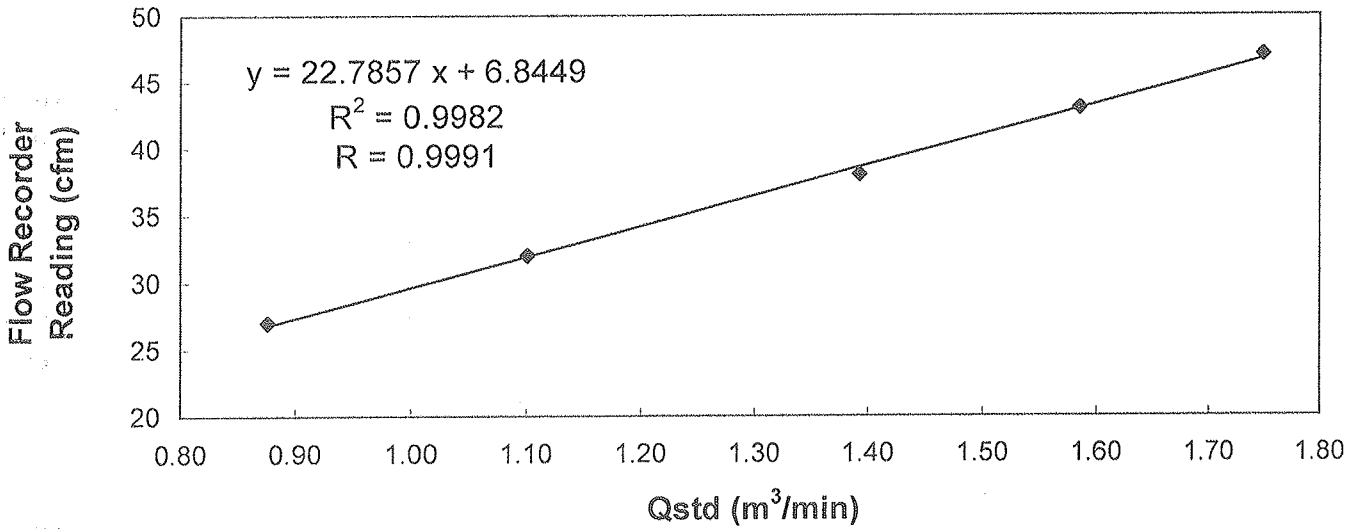
8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong
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Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW Date of Calibration : 03 January 2015
Serial No. : 9864 (ET / EA / 003 / 19) Calibration Due Date : 02 March 2015
Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual


Results	Flow recorder reading (cfm)	47	43	38	32	27
	Qstd (Actual flow rate, m ³ /min)	1.75	1.59	1.39	1.10	0.88
	Pressure : 765.06 mm Hg	Temp. : 288 K				


Sampler 9864 Calibration Curve
Site: Tuen Mun (TM-RA2)

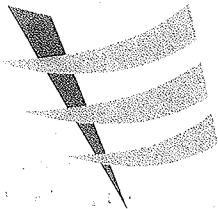


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

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

Calibrated by : 
TANG, Chung Hang
(Assistant Supervisor)

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



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Web site : www.ets-testconsult.com

Calibration Report
of
High Volume Air Sampler

Manufacturer : Graseby GMW Date of Calibration : 03 March 2015

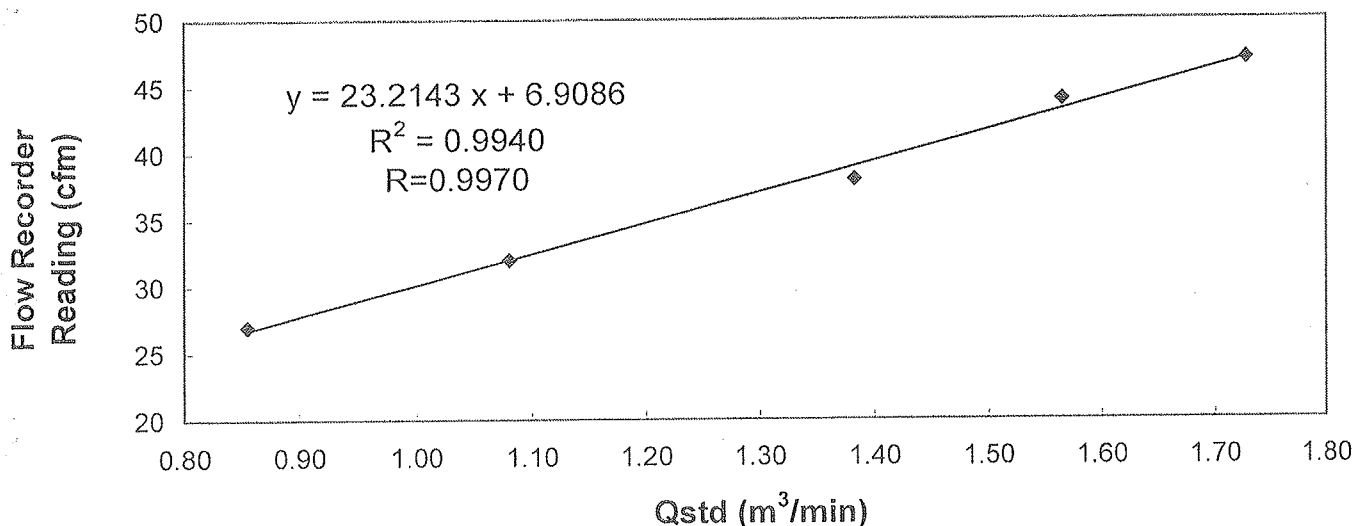
Serial No. : 9864 (ET / EA / 003 / 19) Calibration Due Date : 02 May 2015

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	47	44	38	32	27
Qstd (Actual flow rate, m ³ /min)	1.73	1.56	1.38	1.08	0.85
Pressure :	763.56 mm Hg		Temp. :	292 K	

Sampler 9864 Calibration Curve
Site: Tuen Mun (TM-RA2)



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
(Senior Technician)

Checked by :


LAW, Sau Yee
(Senior Environmental Officer)

- END OF REPORT -

Accepted by :



TISCH ENVIRONMENTAL, INC.
 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 - May 28, 2014 Rootmeter S/N 0438320 Ta (K) - 298
 Operator Tisch Orifice I.D. - 2774 Pa (mm) - 751.84

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	1.4550	3.2	2.00
2	NA	NA	1.00	1.0180	6.4	4.00
3	NA	NA	1.00	0.9110	8.0	5.00
4	NA	NA	1.00	0.8680	8.8	5.50
5	NA	NA	1.00	0.7180	12.9	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9850	0.6770	1.4066	0.9957	0.6843	0.8903
0.9809	0.9635	1.9892	0.9915	0.9740	1.2591
0.9786	1.0743	2.2240	0.9893	1.0859	1.4078
0.9777	1.1263	2.3326	0.9883	1.1386	1.4765
0.9723	1.3541	2.8132	0.9828	1.3688	1.7807
Qstd slope (m) = 2.07732			Qa slope (m) = 1.30078		
intercept (b) = -0.00541			intercept (b) = -0.00343		
coefficient (r) = 0.99989			coefficient (r) = 0.99989		

y axis = $\text{SQRT}[\text{H2O}(\text{Pa}/760)(298/\text{Ta})]$

y axis = $\text{SQRT}[\text{H2O}(\text{Ta}/\text{Pa})]$

CALCULATIONS

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

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

For subsequent flow rate calculations:

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



Appendix B2

Impact Air Quality Monitoring Results

Summary of 24-hr TSP Monitoring Results

Monitoring Station : TM-A1

Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
01/03/15	08:00	02/03/15	08:00	17442.86	17466.86	24.00	0.9240	0.9240	0.9240	2.7943	2.9441	113
07/03/15	08:40	08/03/15	08:40	17470.86	17494.86	24.00	0.8613	0.8613	0.8613	2.8094	2.9690	129
13/03/15	11:00	14/03/15	11:00	17496.86	17520.86	24.00	0.8613	0.8613	0.8613	2.7823	2.9433	130
19/03/15	11:00	20/03/15	11:00	17524.86	17548.86	24.00	0.8613	0.8613	0.8613	2.7873	2.9608	140
25/03/15	08:00	26/03/15	08:00	17550.86	17574.86	24.00	0.8613	0.8613	0.8613	2.8112	2.9119	81
31/03/15	09:15	01/04/15	09:15	17578.86	17602.86	24.00	0.8613	0.8613	0.8613	2.7911	2.9357	117

Monitoring Station : TM-RA2

Date	Start Time	Finish		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
		Date	Time	Initial	Final		Initial	Final		Initial	Final	
01/03/15	08:00	02/03/15	08:00	4302.05	4326.05	24.00	1.1040	1.1040	1.1040	2.7897	2.9903	126
07/03/15	08:45	08/03/15	08:45	4330.05	4354.05	24.00	1.0809	1.0809	1.0809	2.8081	3.0758	113
13/03/15	11:05	14/03/15	11:05	4356.05	4380.05	24.00	1.0809	1.0809	1.0809	2.7866	3.0561	173
19/03/15	10:50	20/03/15	10:50	4384.05	4408.05	24.00	1.0809	1.0809	1.0809	2.8003	3.0344	150
25/03/15	08:00	26/03/15	08:00	4410.05	4434.05	24.00	1.0809	1.0809	1.0809	2.8034	3.0124	134
31/03/15	09:20	01/04/15	09:20	4438.05	4462.05	24.00	1.0809	1.0809	1.0809	2.7806	2.9957	138

Summary of 1-hr TSP Monitoring Results

Monitoring Station : TM-A1

Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/03/15	08:10	09:10	17466.86	17467.86	1.00	0.9240	0.9240	0.9240	2.8117	2.8204	157
03/03/15	09:10	10:10	17467.86	17468.86	1.00	0.9240	0.9240	0.9240	2.8001	2.8082	146
05/03/15	09:20	10:20	17468.86	17469.86	1.00	0.8613	0.8613	0.8613	2.7895	2.8004	211
07/03/15	07:40	08:40	17469.86	17470.86	1.00	0.8613	0.8613	0.8613	2.7934	2.8007	141
10/03/15	08:15	09:15	17494.86	17495.86	1.00	0.8613	0.8613	0.8613	2.7899	2.7986	168
12/03/15	09:55	10:55	17495.86	17496.86	1.00	0.8613	0.8613	0.8613	2.7926	2.8019	180
14/03/15	11:00	12:00	17520.86	17521.86	1.00	0.8613	0.8613	0.8613	2.8034	2.8137	199
14/03/15	12:00	13:00	17521.86	17522.86	1.00	0.8613	0.8613	0.8613	2.7945	2.8058	219
17/03/15	10:50	11:50	17523.86	17523.86	1.00	0.8613	0.8613	0.8613	2.7745	2.7869	240
19/03/15	09:35	10:35	17523.86	17524.86	1.00	0.8613	0.8613	0.8613	2.7693	2.7806	219
21/03/15	10:05	11:05	17548.86	17549.86	1.00	0.8613	0.8613	0.8613	2.7927	2.8017	174
24/03/15	11:00	12:00	17549.86	17550.86	1.00	0.8613	0.8613	0.8613	2.7851	2.7930	153
26/03/15	09:35	10:35	17574.86	17575.86	1.00	0.8613	0.8613	0.8613	2.7639	2.7721	159
26/03/15	13:00	14:00	17575.86	17576.86	1.00	0.8613	0.8613	0.8613	2.7912	2.7989	149
28/03/15	09:50	10:50	17576.86	17577.86	1.00	0.8613	0.8613	0.8613	2.7834	2.7914	155
31/03/15	08:10	09:10	17577.86	17578.86	1.00	0.8613	0.8613	0.8613	2.7921	2.8015	182

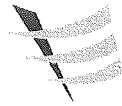
Monitoring Station : TM-RA2

Date	Time		Elapse Time		Sampling Time (hrs)	Flow Rate (m ³ /min.)		Average (m ³ /min.)	Filter Weight (g)		Conc. (µg/m ³)
	Start	Finish	Initial	Final		Initial	Final		Initial	Final	
03/03/15	08:15	09:15	4326.05	4327.05	1.00	1.1040	1.1040	1.1040	2.8035	2.8220	279
03/03/15	09:15	10:15	4327.05	4328.05	1.00	1.1040	1.1040	1.1040	2.7989	2.8178	285
05/03/15	09:25	10:25	4328.05	4329.05	1.00	1.0809	1.0809	1.0809	2.7892	2.8041	230
07/03/15	07:45	08:45	4329.05	4330.05	1.00	1.0809	1.0809	1.0809	2.7980	2.8150	262
10/03/15	08:20	09:20	4354.05	4355.05	1.00	1.0809	1.0809	1.0809	2.7922	2.8106	284
12/03/15	10:15	11:15	4355.05	4356.05	1.00	1.0809	1.0809	1.0809	2.7963	2.8153	293
14/03/15	11:05	12:05	4380.05	4381.05	1.00	1.0809	1.0809	1.0809	2.7794	2.7915	187
14/03/15	12:05	13:05	4381.05	4382.05	1.00	1.0809	1.0809	1.0809	2.8043	2.8150	165
17/03/15	10:55	11:55	4382.05	4383.05	1.00	1.0809	1.0809	1.0809	2.7879	2.7991	173
19/03/15	09:40	10:40	4383.05	4384.05	1.00	1.0809	1.0809	1.0809	2.8003	2.8107	160
21/03/15	10:10	11:10	4408.05	4409.05	1.00	1.0809	1.0809	1.0809	2.7886	2.8087	310
24/03/15	10:55	11:55	4409.05	4410.05	1.00	1.0809	1.0809	1.0809	2.7781	2.7972	295
26/03/15	09:30	10:30	4434.05	4435.05	1.00	1.0809	1.0809	1.0809	2.7802	2.7990	290
26/03/15	13:00	14:00	4435.05	4436.05	1.00	1.0809	1.0809	1.0809	2.7868	2.8062	299
28/03/15	09:55	10:55	4436.05	4437.05	1.00	1.0809	1.0809	1.0809	2.7990	2.8165	270
31/03/15	08:15	09:15	4437.05	4438.05	1.00	1.0809	1.0809	1.0809	2.7874	2.8055	279

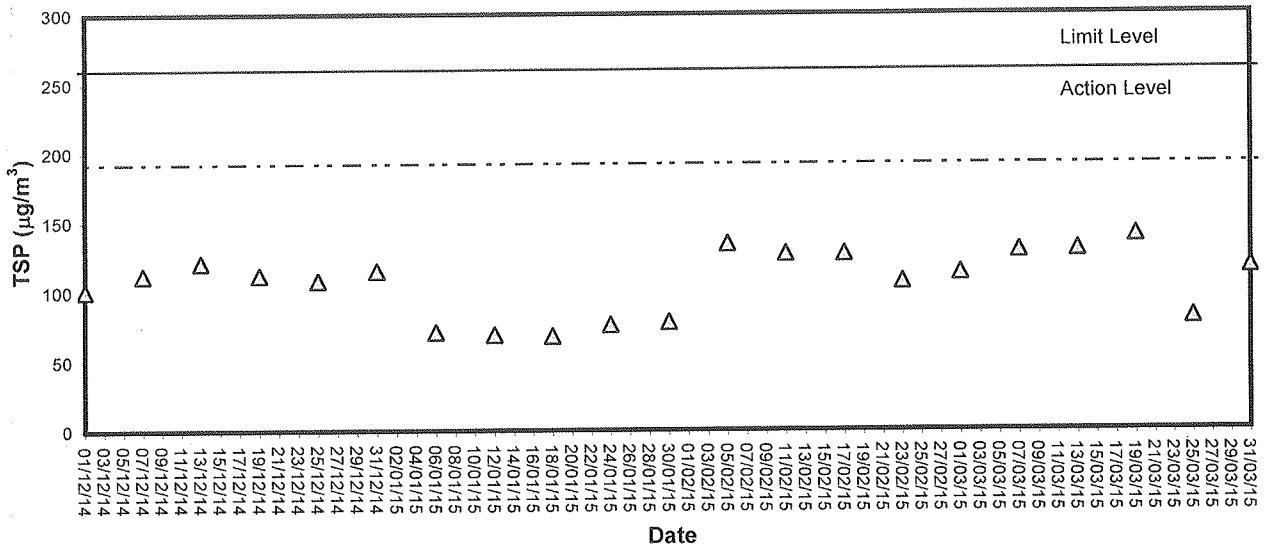


Appendix B3

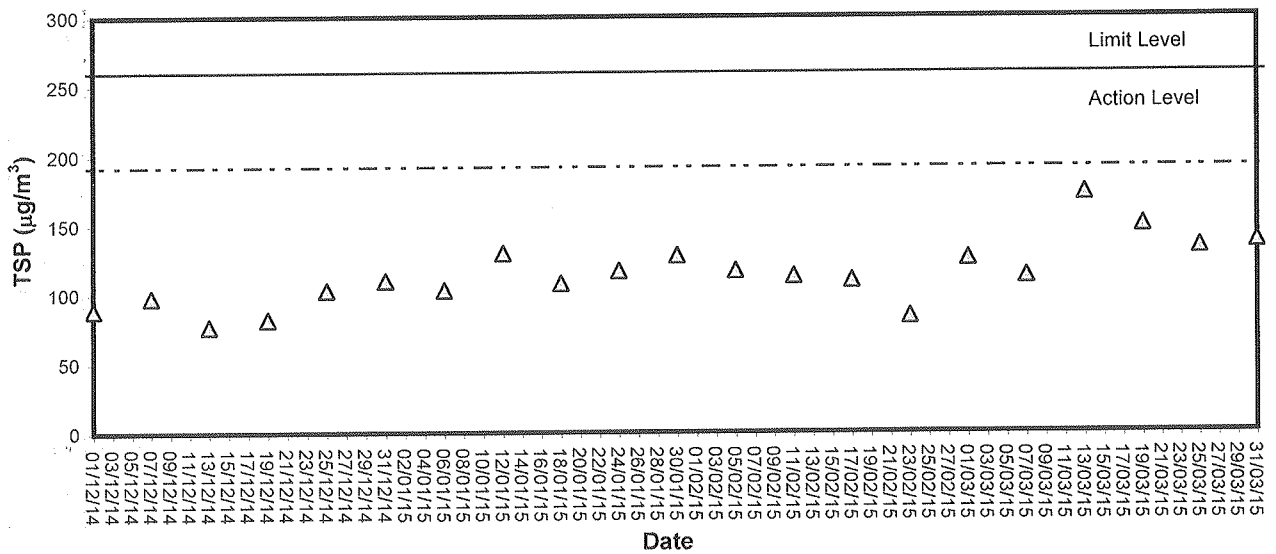
Graphical Plots of Impact Air Quality Monitoring Data

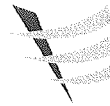


24-hour TSP level at TM-A1

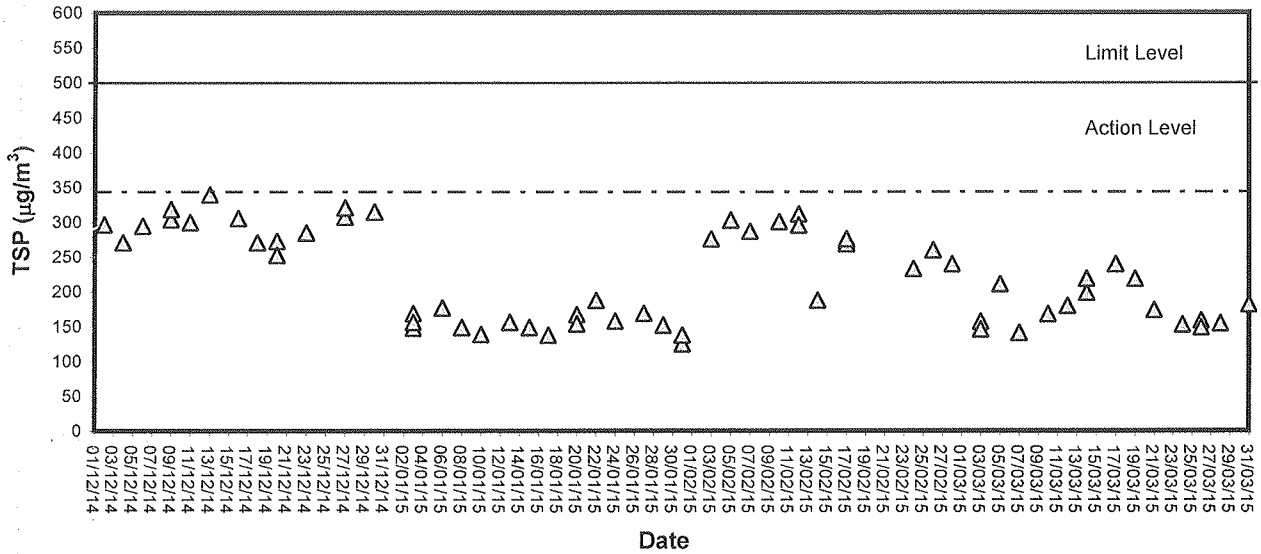


24-hour TSP level at TM-RA2

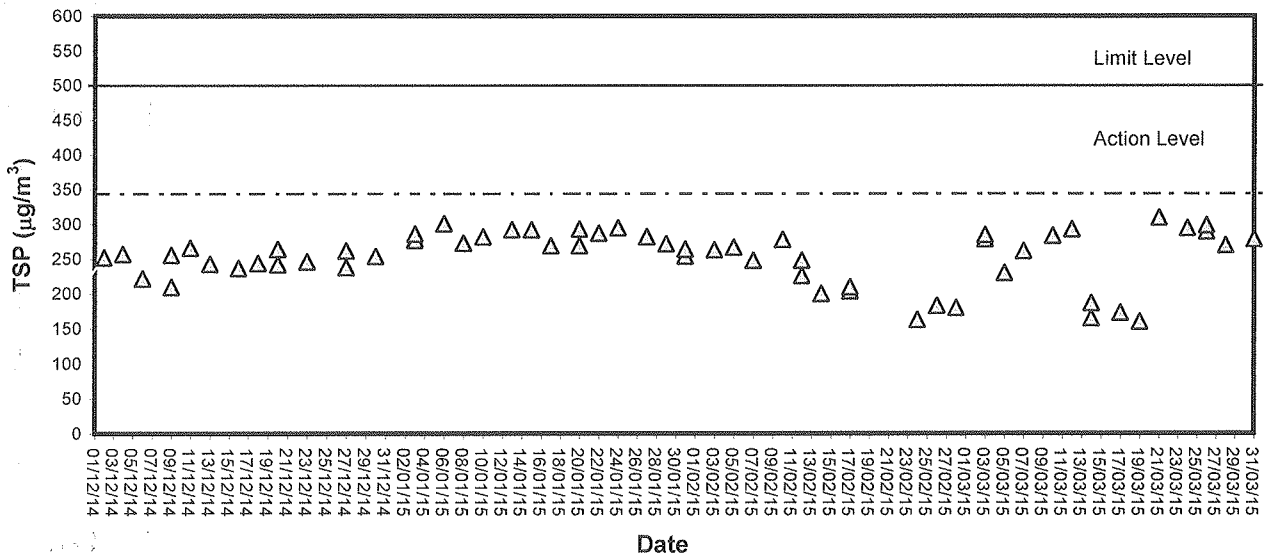




1-hour TSP level at TM-A1



1-hour TSP level at TM-RA2



Appendix C1

Calibration Certificates for Impact Marine Water Quality Monitoring Equipments



Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/011 Manufacturer : HACH

Model No. : 2100Q Serial No. : 12060 C 018534

Date of Calibration : 05/01/2015 Due Date : 04/04/2015

Ref. No. of Turbidity Standard used (4000NTU)

005/6.1/001/7

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	19.8	-1.00
100	104	4.00
800	788	-1.50

(*) 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 : hy

Checked by : [Signature]



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>17/12/2014</u>	Calibration Due Date : <u>16/03/2015</u>

Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/008

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.0	Corrected	19.4
DO Meter reading	Measured	19.4	Difference	0.0

Standardization of sodium thiosulphate (Na₂S₂O₃) solution

Reagent No. of Na ₂ S ₂ O ₃ titrant	CPE/012/4.5/001/9	Reagent No. of 0.025N K ₂ Cr ₂ O ₇	CPE/012/4.4/001/32
		Trial 1	Trial 2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)		0.00	10.15
Final Vol. of Na ₂ S ₂ O ₃ (ml)		10.15	20.35
Vol. of Na ₂ S ₂ O ₃ used (ml)		10.15	10.20
Normality of Na ₂ S ₂ O ₃ solution (N)		0.02463	0.02451
Average Normality (N) of Na ₂ S ₂ O ₃ solution (N)		0.02457	
Acceptance criteria, Deviation		Less than ± 0.001N	

Calculation: Normality of Na₂S₂O₃, N = 0.25 / ml Na₂S₂O₃ used

Linearity Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.40	22.80	0.00	6.60	10.30
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.40	22.80	29.30	6.60	10.30	14.00
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.40	11.40	6.50	6.60	3.70	3.70
Dissolved Oxygen (DO), mg/L	7.52	7.52	4.29	4.35	2.44	2.44
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	7.61	7.20	7.41	7.52	7.52	7.52	1.47
5	4.28	4.75	4.52	4.29	4.35	4.32	4.52
10	2.50	2.49	2.50	2.44	2.44	2.44	2.43
Linear regression coefficient				0.9978			



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/012/4.7/002/29	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/29
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*Determination of dissolved oxygen content by Winkler Titration ***

Salinity (ppt)	10		30	
	1	2	1	2
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.90	23.80	34.40
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.90	23.80	34.40	44.90
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.90	11.90	10.60	10.50
Dissolved Oxygen (DO), mg/L	7.85	7.85	6.99	6.93
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	7.68	7.78	7.73	7.85	7.85	7.85	1.54
30	6.88	6.89	6.89	6.99	6.93	6.96	1.01

Acceptance Criteria

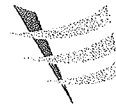
- (1) Differenc between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
- (2) Linear regression coefficient : >0.99
- (3) Zero checking: 0.0mg/L
- (4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

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 : 17/12/2014 Due Date : 16/03/2015

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

S/001/5


Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.5	1.7


(* 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/008/006</u>	Manufacturer : <u>YSI</u>
Model No. : <u>Pro 2030</u>	Serial No. : <u>12A 100554</u>
Date of Calibration : <u>17/03/2015</u>	Calibration Due Date : <u>16/06/2015</u>

Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/008

Ref. No. of Water Bath : ---

		Temperature (°C)		
Reference Thermometer reading	Measured	20.0	Corrected	19.4
DO Meter reading	Measured	19.2	Difference	0.2

Standardization of sodium thiosulphate ($Na_2S_2O_3$) solution

Reagent No. of $Na_2S_2O_3$ titrant	CPE/012/4.5/001/11	Reagent No. of 0.025N $K_2Cr_2O_7$	CPE/012/4.4/001/35
		Trial 1	Trial 2
Initial Vol. of $Na_2S_2O_3$ (ml)		0.00	10.15
Final Vol. of $Na_2S_2O_3$ (ml)		10.15	20.40
Vol. of $Na_2S_2O_3$ used (ml)		10.15	10.25
Normality of $Na_2S_2O_3$ solution (N)		0.02463	0.02439
Average Normality (N) of $Na_2S_2O_3$ solution (N)		0.02451	
Acceptance criteria, Deviation		Less than $\pm 0.001N$	

Calculation: Normality of $Na_2S_2O_3$, $N = 0.25 / ml Na_2S_2O_3$ used

Linearity Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
	1	2	1	2	1	2
Initial Vol. of $Na_2S_2O_3$ (ml)	0.00	11.20	22.60	0.00	6.80	10.40
Final Vol. of $Na_2S_2O_3$ (ml)	11.20	22.60	29.20	6.80	10.40	14.10
Vol. (V) of $Na_2S_2O_3$ used (ml)	11.20	11.40	6.60	6.80	3.60	3.70
Dissolved Oxygen (DO), mg/L	7.37	7.50	4.34	4.47	2.37	2.43
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

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

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.42	7.90	7.66	7.37	7.50	7.44	2.91
5	4.38	4.10	4.24	4.34	4.47	4.41	3.93
10	2.50	2.48	2.49	2.37	2.43	2.40	3.68
Linear regression coefficient				0.9954			



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/012/4.7/002/34	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/34
-----------------------------	--------------------	-----------------------------	--------------------

Determination of dissolved oxygen content by Winkler Titration **

Salinity (ppt)	10		30	
	1	2	1	2
Trial				
Initial Vol. of Na ₂ S ₂ O ₃ (ml)	0.00	11.90	23.50	34.00
Final Vol. of Na ₂ S ₂ O ₃ (ml)	11.90	23.50	34.00	44.30
Vol. (V) of Na ₂ S ₂ O ₃ used (ml)	11.90	11.60	10.50	10.30
Dissolved Oxygen (DO), mg/L	7.83	7.63	6.91	6.78
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	7.20	7.65	7.43	7.83	7.63	7.73	3.96
30	6.90	6.40	6.65	6.91	6.78	6.85	2.96

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 : 17/03/2015 Due Date : 16/06/2015

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

S/001/5

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

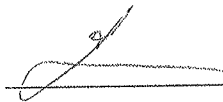
(*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

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 : 



Appendix C2

Impact Marine Water Quality Monitoring Results

Mid-Flood Tide

Monitoring Station : TM-FC1

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
03/03/15	1738-1757	19/Cloudy	Surface	17.5	26.9	27.0	7.16	7.15	7.02	86.8	86.6	7.17	7.15	10.3	10.2	10.6		
					27.0	7.13	7.02	86.4	7.12	10.1								
			Middle	17.5	27.1	6.88	6.90	83.4	7.36	7.40	10.4	10.5	7.44					
					27.2	6.91	6.90	83.8	7.43	10.6								
			Bottom	17.6	27.3	6.67	6.65	80.9	7.73	7.77	10.9	11.0	7.72					
					27.4	6.63	6.65	80.4	7.81	11.1								
05/03/15	1913-1930	19/Cloudy	Surface	17.7	27.1	27.2	7.02	7.00	6.88	85.2	85.0	7.36	7.41	10.6	10.7	11.2		
					27.2	6.98	7.00	84.8	7.45	10.8								
			Middle	17.7	27.3	6.78	6.76	82.2	7.65	7.69	10.9	11.0	7.72					
					27.2	6.73	6.76	81.6	7.72	11.1								
			Bottom	17.8	27.3	6.54	6.53	79.4	8.02	8.06	11.8	11.9	7.72					
					27.4	6.51	6.53	79.2	8.09	12.0								
07/03/15	0913-0928	17/Cloudy	Surface	17.8	26.8	26.9	7.26	7.24	7.13	88.3	88.0	6.78	6.74	9.8	9.7	10.4		
					26.9	7.22	7.02	85.5	7.22	10.4								
			Middle	17.9	27.0	7.03	7.02	85.2	7.31	7.27	10.6	10.5	7.24					
					27.0	7.01	7.02	85.2	7.31	10.6								
			Bottom	18.0	27.2	6.73	6.71	81.8	7.67	7.70	10.8	10.9	7.24					
					27.3	6.69	6.71	81.3	7.73	11.0								
10/03/15	1018-1030	18/Cloudy	Surface	18.7	26.8	26.8	6.86	6.88	6.80	83.3	83.6	7.05	7.08	10.2	10.1	10.5		
					26.8	6.90	6.88	83.8	7.11	10.2								
			Middle	18.8	27.0	6.74	6.73	81.9	7.30	7.34	10.4	10.5	7.34					
					26.9	6.71	6.73	81.5	7.37	10.6								
			Bottom	18.9	27.2	6.65	6.64	80.8	7.64	7.61	11.0	11.0	7.34					
					27.2	6.62	6.64	80.4	7.58	11.0								
12/03/15	1113-1130	17/Cloudy	Surface	18.6	26.9	26.9	6.92	6.94	6.86	84.1	84.4	6.96	6.99	10.0	10.1	10.4		
					26.8	6.96	6.94	84.6	7.02	10.2								
			Middle	18.7	27.1	6.80	6.79	82.7	7.21	7.25	10.3	10.4	7.25					
					27.0	6.77	6.79	82.3	7.28	10.5								
			Bottom	18.8	27.2	6.71	6.70	81.6	7.55	7.52	10.9	10.8	7.25					
					27.3	6.68	6.70	81.2	7.49	10.7								
14/03/15	1212-1230	17/Cloudy	Surface	18.1	27.0	27.1	7.23	7.22	7.17	89.7	89.6	6.92	6.93	9.7	9.7	10.0		
					27.1	7.21	7.12	89.5	6.94	9.7								
			Middle	18.2	27.2	7.13	7.12	88.6	6.99	7.00	10.0	10.1	7.02					
					27.3	7.11	7.12	88.4	7.01	10.2								
			Bottom	18.4	27.4	7.03	7.02	87.5	7.13	7.12	10.3	10.2	7.02					
					27.5	7.01	7.02	87.3	7.11	10.1								
17/03/15	1642-1700	21/Cloudy	Surface	18.2	27.1	27.1	6.95	6.94	6.88	85.2	85.1	7.13	7.11	10.3	10.2	10.6		
					27.1	6.92	6.94	84.9	7.09	10.1								
			Middle	18.2	27.2	6.84	6.83	83.9	7.45	7.42	10.7	10.6	7.41					
					27.3	6.81	6.83	83.5	7.39	10.5								
			Bottom	18.2	27.3	6.67	6.66	81.8	7.74	7.71	11.1	11.0	7.41					
					27.3	6.64	6.66	81.5	7.67	10.9								

Mid-Flood Tide

Monitoring Station : TM-FC1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/03/15	1813-1830	19/Cloudy	Surface	18.2	27.2	27.3	6.83	6.85	6.79	83.9	84.1	7.19	7.23	10.3	10.4	11.1		
					27.3		6.86			84.2		7.26		10.5				
					27.4	27.4	6.76	6.74		82.9	82.7	7.54	7.58	11.0	11.1			
21/03/15	0816-0830	21/Cloudy	Bottom	18.3	27.3	27.5	6.72	6.53	6.53	80.4	80.2	7.61	7.93	11.7	11.8	10.6		
					27.4		6.55			80.4		7.88		11.7				
					27.5	27.1	6.51	7.07	7.00	79.9	87.9	7.97	6.95	9.9	9.8			
24/03/15	1000-1015	19/Cloudy	Surface	20.7	27.1	27.1	7.05	6.92	6.72	88.1	89.2	6.88	6.10	9.2	9.1	9.7		
					27.3		6.94			86.4		7.29		10.4				
					27.3	27.3	6.91	6.93		86.0	86.2	7.36	7.33	10.6	10.5			
26/03/15	1113-1130	19/Cloudy	Middle	20.4	27.4	27.5	6.76	6.77	6.77	84.1	84.3	7.73	7.77	11.4	11.5	11.1		
					27.5		6.78			84.4		7.80		11.6				
					28.9	28.9	6.94	6.92	6.16	89.4	89.2	6.12	6.10	9.2	9.1			
28/03/15	0913-0923	19/Cloudy	Surface	20.0	28.9	28.3	6.90	7.51	7.39	88.9	96.4	6.07	7.19	10.5	10.4	10.2		
					29.0		6.53			83.9		6.74		10.9				
					29.0	29.0	6.50	6.52		83.5	83.7	6.70	7.52	11.1	11.0			
31/03/15	1210-1230	23/Cloudy	Bottom	20.3	29.1	29.1	6.17	6.16	6.16	79.3	79.1	6.88	6.87	10.1	10.0	11.3		
					29.0		6.14			78.9		6.85		10.1				
					28.2	28.3	7.52	7.30	7.22	96.6	96.4	7.22	7.19	10.5	10.4			
28/03/15	0913-0923	19/Cloudy	Middle	20.0	28.3	28.5	7.49	7.14	7.11	96.2	91.0	7.16	7.11	10.3	10.1	10.2		
					28.4		7.28			93.5		7.48		10.9				
					28.5	28.5	7.25	7.27		93.1	93.3	7.55	7.52	11.1	11.0			
28/03/15	0913-0923	19/Cloudy	Bottom	20.1	28.6	28.6	7.09	7.07	7.07	91.1	90.8	7.86	7.89	11.7	11.8	10.2		
					28.6		7.05			90.5		7.92		11.7				
					28.1	28.2	7.29	7.30	7.22	92.8	92.9	7.00	6.99	10.0	10.0			
28/03/15	0913-0923	19/Cloudy	Surface	19.1	28.2	28.2	7.31	7.14	7.11	93.0	91.0	6.98	7.11	10.2	10.1	10.2		
					28.3		7.13			90.9		7.12		10.2				
					28.3	28.3	7.15	7.14		91.1	91.0	7.10	7.11	10.0	10.1			
28/03/15	0913-0923	19/Cloudy	Middle	19.2	28.4	28.4	7.06	7.07	7.07	90.1	90.2	7.23	7.22	10.5	10.4	10.2		
					28.3		7.08			90.2		7.21		10.3				
					28.3	28.3	7.22	7.21	7.11	95.3	95.1	7.32	7.38	10.5	10.6			
28/03/15	0913-0923	19/Cloudy	Bottom	19.4	28.3	28.3	7.19	7.02	7.02	94.9	92.6	7.43	7.69	10.7	10.6	10.2		
					28.3		7.19			92.7		7.65		11.1				
					28.4	28.5	7.03	7.02		92.5	92.6	7.73	7.69	11.3	11.2			
28/03/15	0913-0923	19/Cloudy	Surface	21.4	28.5	28.7	6.88	6.86	6.86	90.8	90.5	8.05	8.08	12.0	12.1	11.3		
					28.4		6.88			90.8		8.05		12.0				
					28.5	28.7	6.84	6.86	6.86	90.2	90.5	8.11	8.08	12.2	12.1			

Mid-Flood Tide

Monitoring Station : TM-FM1

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
03/03/15	1713-1730	19/Cloudy	1.0	17.5	26.9	27.0	7.12	7.11	7.04	7.02	86.3	86.2	10.0	10.0	10.4			
					27.0		7.09		7.00		86.0		10.0					
					27.0	27.1	6.93	6.92	7.18	7.21	84.1	83.9	10.3	10.4				
05/03/15	1846-1903	19/Cloudy	16.2	17.6	27.1	27.2	6.90	6.79	7.24	7.59	83.6	82.3	10.5	10.7	10.6			
					27.2	27.2	6.77	6.79	7.56	7.59	82.1	82.3	10.6	10.7				
					27.2	27.1	6.80	6.97	7.61	7.16	82.4	84.6	10.2	10.3				
07/03/15	0850-0905	17/Cloudy	1.0	17.6	27.0	27.1	6.99	6.97	7.18	7.08	84.9	84.6	10.4	10.3	10.1			
					27.1	27.1	6.95	6.82	7.35	7.37	84.3	82.7	10.6	10.6				
					27.1	27.2	6.84	6.82	7.38	7.66	83.0	80.7	10.6	11.0				
10/03/15	1000-1014	18/Cloudy	16.8	17.9	27.2	27.4	6.79	6.65	7.63	7.66	82.4	80.7	10.9	11.0	10.5			
					27.3	27.4	6.66	6.65	7.63	7.66	80.9	80.7	10.9	11.0				
					27.1	27.1	6.88	6.86	7.40	7.37	83.7	83.5	10.6	10.4				
12/03/15	1046-1103	17/Cloudy	1.0	18.7	26.8	26.9	7.19	7.20	7.03	7.00	87.4	87.5	9.9	9.8	9.9			
					26.9	26.8	6.91	6.90	7.04	7.08	87.6	85.9	9.8	10.1				
					26.9	26.9	6.89	6.79	7.12	7.08	86.1	82.5	10.0	10.4				
14/03/15	1148-1206	17/Cloudy	8.8	18.8	27.0	27.1	6.80	6.79	7.31	7.28	85.7	82.5	10.3	10.4	10.3			
					26.9	26.9	6.78	6.69	7.40	7.37	82.4	81.3	10.5	10.9				
					26.9	27.1	6.84	6.96	7.52	7.56	81.2	84.7	10.8	10.9				
17/03/15	1616-1633	21/Cloudy	16.6	18.2	27.0	27.2	6.68	6.64	6.94	6.91	84.8	84.7	9.9	9.9	11.1			
					27.1	27.1	6.97	6.85	6.88	7.19	84.5	83.3	9.9	10.3				
					27.1	27.3	6.95	6.71	7.15	7.29	83.4	82.6	10.2	10.5				

Mid-Flood Tide

Monitoring Station : TM-FM1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
19/03/15	1746-1803	19/Cloudy	Surface	18.2	27.1	27.2	6.75	6.78	6.71	82.9	83.2	7.10	7.13	10.0	10.1	10.6		
					27.2	27.2	6.80	6.65	7.16	7.41	10.2	10.7						
					27.4	27.4	6.66	6.55	7.37	7.68	10.5	11.1						
21/03/15	0755-0810	21/Cloudy	Bottom	18.3	27.3	27.4	6.64	6.55	6.55	80.7	80.5	7.45	7.68	10.9	11.1	10.3		
					27.4	27.4	6.57	7.14	7.71	7.84	11.2	9.8						
					27.4	27.1	6.53	7.09	7.65	7.19	11.0	10.3						
24/03/15	0940-0955	19/Cloudy	Surface	20.6	27.0	28.9	7.13	6.84	6.65	88.7	88.9	6.80	5.95	8.8	8.9	9.2		
					27.1	28.8	7.15	6.46	7.09	6.14	9.0	9.2						
					27.2	29.1	7.06	6.22	7.21	6.37	10.5	9.6						
26/03/15	1047-1105	19/Cloudy	Middle	20.3	27.3	29.2	6.93	6.22	6.22	87.8	87.6	7.17	7.47	10.1	10.9	10.9		
					27.3	29.2	6.93	6.22	6.91	6.37	10.8	10.3						
					27.4	29.2	6.89	6.22	7.43	6.37	11.0	9.6						
28/03/15	0852-0908	19/Cloudy	Surface	19.2	28.2	28.2	7.56	7.58	7.49	85.7	86.0	7.09	7.12	10.2	10.3	10.1		
					28.2	28.2	7.59	7.40	7.58	6.15	7.15	10.4	10.7					
					28.3	28.4	7.42	7.14	7.41	6.38	7.77	10.6	11.7					
31/03/15	1146-1202	23/Cloudy	Surface	21.4	28.5	28.5	7.38	7.16	7.11	91.8	91.7	7.73	7.10	11.5	11.5	11.0		
					28.5	28.5	7.13	7.16	7.14	6.35	7.09	11.9	11.5					
					28.0	28.0	7.35	7.36	7.14	6.35	10.2	10.3						

Mid-Flood Tide

Monitoring Station : TM-FM2

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
03/03/15	1651-1707	19/Cloudy	Surface	17.5	26.9	7.08	7.06	85.8	85.6	7.08	7.11	10.1	10.2	10.6				
			Middle	17.5	27.0	7.04	6.97	85.4	84.5	7.13	7.36	10.3	10.5					
			Bottom	17.6	27.2	6.99	6.95	84.7	81.6	7.32	7.70	10.4	11.0					
05/03/15	1832-1840	19/Cloudy	Surface	17.6	26.9	6.74	6.93	81.7	84.1	7.67	7.40	10.8	10.6	10.9				
			Middle	17.7	27.0	6.71	6.82	81.4	82.7	7.42	7.61	10.8	10.9					
			Bottom	17.6	27.1	6.94	6.80	83.9	80.8	7.37	7.93	10.4	11.2					
07/03/15	0829-0844	17/Cloudy	Surface	17.7	26.7	6.67	7.13	81.0	86.7	7.89	6.90	10.0	9.9	10.4				
			Middle	17.8	27.0	6.64	6.97	80.5	84.7	6.92	7.28	10.3	10.5					
			Bottom	17.9	27.1	7.12	6.77	86.6	82.3	7.24	7.59	10.7	10.9					
10/03/15	0940-0955	18/Cloudy	Surface	18.6	26.7	6.75	6.94	82.4	84.3	7.56	7.16	10.8	10.2	10.6				
			Middle	18.8	26.9	6.92	6.77	82.1	82.2	7.19	7.40	10.3	10.7					
			Bottom	18.9	27.1	6.95	6.59	84.4	80.1	7.44	7.70	10.6	11.0					
12/03/15	1023-1040	17/Cloudy	Surface	18.5	26.8	6.61	7.00	79.8	85.1	7.73	7.07	10.9	10.1	10.6				
			Middle	18.7	27.0	6.57	6.83	84.9	83.0	7.10	7.31	10.2	10.5					
			Bottom	18.8	27.1	7.01	6.65	85.2	80.9	7.03	7.61	10.6	11.1					
14/03/15	1124-1142	17/Cloudy	Surface	18.2	26.9	6.63	7.03	80.6	87.3	7.64	7.02	11.0	10.0	10.1				
			Middle	18.3	27.0	7.02	6.94	87.4	86.3	7.01	7.00	10.0	10.1					
			Bottom	18.5	27.2	6.93	6.78	86.2	84.8	6.99	7.10	10.2	10.3					
17/03/15	1554-1610	21/Cloudy	Surface	18.1	27.3	6.81	6.82	84.7	84.6	7.11	6.96	9.8	9.9	10.6				
			Middle	18.2	27.2	6.83	6.78	84.9	83.1	7.09	7.40	10.0	10.5					
			Bottom	18.2	27.3	6.90	6.68	84.7	82.0	6.92	7.66	10.5	11.2					
					27.2	6.69	6.68	82.1	82.0	7.62	7.70	11.2	11.3	11.4				

Mid-Flood Tide

Monitoring Station : TM-FM2

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/03/15	1723-1740	19/Cloudy	Surface	18.0	27.1	27.2	6.81	6.80	6.75	83.6	83.5	7.07	7.04	10.0	10.0	10.7		
					27.2	27.3	6.79	6.71	83.4	7.01	10.0							
					27.3	27.2	6.72	6.69	82.5	7.39	10.6							
21/03/15	0735-0750	21/Cloudy	Bottom	18.2	27.3	27.4	6.60	6.58	6.58	81.0	80.8	7.74	7.78	11.3	11.4	9.9		
					27.4	27.0	6.56	7.18	80.5	7.81	9.7							
					27.0	27.3	7.16	7.09	89.1	6.91	10.1							
24/03/15	0920-0935	19/Cloudy	Middle	18.7	27.3	27.3	7.10	7.09	7.13	88.4	88.3	7.30	7.35	10.6	10.7	10.6		
					27.3	27.4	7.08	6.82	88.1	7.39	10.8							
					27.4	27.5	6.84	6.82	85.1	7.65	11.2							
26/03/15	1023-1040	19/Cloudy	Surface	20.5	28.8	28.9	6.85	6.87	6.62	88.2	88.0	5.75	5.73	8.9	8.8	9.1		
					28.9	29.1	6.89	6.37	87.7	5.70	8.7							
					29.1	29.1	6.38	6.22	82.0	6.04	9.0							
28/03/15	0831-0847	19/Cloudy	Surface	19.0	29.1	29.1	6.35	6.22	6.22	81.6	79.8	6.06	6.26	9.2	9.4	11.1		
					29.1	28.3	6.20	7.46	79.6	6.24	9.3							
					28.3	28.3	6.23	7.36	80.0	7.34	10.5							
31/03/15	1123-1140	23/Cloudy	Surface	21.5	28.3	28.3	7.47	7.46	7.41	96.0	95.9	7.34	7.37	10.5	10.5	11.3		
					28.3	28.4	7.44	7.36	95.7	7.39	10.5							
					28.4	28.4	7.37	7.19	94.7	7.57	11.1							
28/03/15	0831-0847	19/Cloudy	Surface	19.0	28.4	28.4	7.34	7.25	7.18	94.3	94.5	7.50	7.54	10.9	11.0	10.2		
					28.4	28.5	7.20	7.10	92.5	7.83	11.6							
					28.5	28.5	7.17	7.04	92.1	7.91	11.8							
28/03/15	0831-0847	19/Cloudy	Surface	19.0	28.5	28.2	7.26	7.04	7.04	92.4	92.3	7.06	7.07	10.0	10.1	10.2		
					28.2	28.3	7.24	7.23	92.2	7.08	10.2							
					28.3	28.3	7.11	7.10	90.7	7.13	10.2							
28/03/15	0831-0847	19/Cloudy	Surface	19.4	28.3	28.3	7.09	7.04	7.18	90.5	90.6	7.11	7.12	10.0	10.1	10.5		
					28.3	28.5	7.03	7.04	89.7	7.26	10.6							
					28.5	28.5	7.05	7.23	89.9	7.28	10.4							
28/03/15	0831-0847	19/Cloudy	Surface	21.3	28.2	28.2	7.24	7.23	7.18	95.5	95.3	7.20	7.24	10.4	10.5	10.5		
					28.1	28.2	7.21	7.13	95.1	7.28	10.6							
					28.3	28.3	7.14	7.13	94.2	7.49	11.9							
28/03/15	0831-0847	19/Cloudy	Surface	21.4	28.3	28.3	7.11	7.13	7.18	93.8	94.0	7.54	7.52	12.1	12.0	11.3		
					28.3	28.5	7.00	6.99	92.4	7.69	11.2							
					28.5	28.5	6.97	6.99	92.0	7.75	11.4							

Mid-Flood Tide

Monitoring Station : TM-FC2

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/03/15	1700-1717	19/Cloudy	Surface	18.1	27.1	27.1	6.85	6.84	6.80	84.0	83.9	7.21	7.17	10.4	10.3	11.0		
					27.0		6.82		6.80	83.7		7.13		10.2				
					27.1	27.2	6.77	6.76	6.80	83.1	83.0	7.47	7.51	10.8	10.9			
21/03/15	0715-0730	21/Cloudy	Bottom	18.3	27.2	27.4	6.74	6.64	6.64	82.8	81.5	7.55	7.87	11.0	11.7	10.6		
					27.4	27.3	6.65	6.62	6.64	81.6	81.3	7.83	7.90	11.5	11.9			
					27.3	27.1	6.62	7.14	7.09	81.3	88.8	7.90	6.93	11.9	10.0			
24/03/15	0900-0915	19/Cloudy	Surface	20.5	27.1	27.1	7.11	7.13	7.09	88.5	88.7	7.01	6.97	10.0	8.1	8.6		
					27.2	27.3	7.07	7.06	7.09	88.0	87.9	7.24	7.29	10.5	10.6			
					27.3	27.4	7.05	6.87	6.87	87.7	85.4	7.33	7.60	10.7	11.1			
26/03/15	1000-1017	19/Cloudy	Surface	20.2	27.4	28.8	6.88	6.72	6.57	85.6	86.5	7.56	5.06	8.0	8.8	11.2		
					27.4	28.8	6.85	6.72	6.57	85.2	86.2	7.64	5.04	8.2	8.0			
					28.8	28.9	6.74	6.42	6.42	86.8	82.6	5.07	5.54	8.9	8.8			
28/03/15	0800-0816	19/Cloudy	Surface	20.1	28.9	28.9	6.43	7.42	7.47	82.2	95.4	5.50	7.61	11.2	11.3	10.3		
					28.9	29.0	6.40	7.22	7.22	95.1	92.8	7.63	7.84	11.4	11.8			
					29.0	28.5	6.21	7.41	7.38	79.8	94.3	7.80	7.84	11.7	11.9			
31/03/15	1100-1117	23/Cloudy	Surface	21.5	28.5	28.3	7.23	7.35	7.23	92.9	92.3	7.88	7.26	10.6	10.5	11.2		
					28.5	28.3	7.03	7.11	7.15	92.9	92.4	7.10	7.11	10.9	10.5			
					28.5	28.2	7.01	7.19	7.19	92.5	93.8	7.27	7.38	11.9	11.8			

Mid-Ebb Tide

Monitoring Station : TM-FC1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)		Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
			Surface	Middle		Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
03/03/15	1242-1300	19/Cloudy	Surface	1.0	17.5	26.9	27.0	7.05	7.03	85.4	85.2	7.24	7.29	10.3	10.4	10.7			
						27.0	7.01	85.0	7.33	10.5									
						27.1	6.81	82.5	7.53	10.6									
05/03/15	1349-1400	19/Cloudy	Bottom	21.4	17.6	27.1	27.1	6.76	6.79	81.9	82.2	7.60	7.57	10.8	11.1				
						27.2	6.57	79.6	7.90	11.1									
						27.2	6.54	79.2	7.97	11.1									
07/03/15	1408-1426	19/Cloudy	Surface	1.0	17.6	27.0	27.1	6.96	6.94	84.4	84.2	7.30	7.35	10.5	10.6	11.1			
						27.1	6.92	84.0	7.39	10.7									
						27.1	6.72	81.4	7.59	10.9									
10/03/15	1610-1630	19/Cloudy	Bottom	23.2	18.0	27.2	27.2	6.67	6.70	80.9	81.2	7.66	7.63	11.1	11.0	10.6			
						27.3	6.48	78.6	7.96	11.7									
						27.2	6.45	78.4	8.03	11.9									
12/03/15	1713-1730	17/Cloudy	Surface	1.0	18.7	26.9	26.9	7.14	7.11	86.8	86.5	6.96	7.00	10.0	10.0	10.8			
						26.8	6.81	82.8	7.04	10.0									
						26.9	6.78	82.4	7.33	10.6									
14/03/15	1842-1900	17/Cloudy	Middle	12.3	18.2	26.9	27.0	6.69	6.67	81.3	81.1	7.50	7.55	10.7	10.8	10.5			
						27.0	6.65	80.8	7.59	10.9									
						27.2	6.50	79.0	7.76	11.1									
17/03/15	1142-1200	20/Cloudy	Bottom	23.2	18.1	27.2	27.3	6.59	6.61	80.5	80.3	7.71	7.75	11.2	11.3	11.1			
						27.2	6.57	78.7	7.83	11.3									
						27.3	6.54	80.1	7.79	11.4									
17/03/15	1142-1200	20/Cloudy	Surface	1.0	18.1	26.8	26.9	6.80	6.85	82.1	82.6	7.24	7.29	10.4	10.5	10.5			
						26.9	6.78	82.4	7.33	10.6									
						26.9	6.67	81.3	7.50	10.7									
17/03/15	1142-1200	20/Cloudy	Middle	12.1	18.1	27.0	27.0	6.65	6.67	80.8	81.1	7.59	7.55	10.9	10.8	10.8			
						27.0	6.65	80.8	7.59	10.9									
						27.2	6.49	79.0	7.76	11.1									
17/03/15	1142-1200	20/Cloudy	Bottom	23.2	18.1	27.2	27.2	6.50	6.49	79.0	78.9	7.76	7.80	11.1	11.2	10.5			
						27.2	6.49	78.7	7.83	11.3									
						27.0	6.83	83.1	7.02	10.0									
17/03/15	1142-1200	20/Cloudy	Surface	1.0	18.0	27.0	27.0	6.87	6.85	83.6	83.4	7.08	7.05	10.2	10.1	10.5			
						26.9	6.71	81.7	7.27	10.4									
						27.2	6.68	81.3	7.34	10.6									
17/03/15	1142-1200	20/Cloudy	Bottom	23.4	18.9	27.0	27.2	6.62	6.61	80.6	80.4	7.61	7.58	11.1	11.0	10.5			
						27.3	6.59	80.2	7.55	10.9									
						27.0	7.17	89.1	7.03	10.0									
17/03/15	1142-1200	20/Cloudy	Surface	1.0	18.0	27.1	27.1	7.15	7.16	88.9	89.0	7.05	7.04	10.2	10.1	10.2			
						27.2	7.09	88.1	7.00	10.1									
						27.3	7.07	87.9	6.98	10.3									
17/03/15	1142-1200	20/Cloudy	Bottom	23.5	18.4	27.4	27.5	6.93	6.94	86.2	86.3	7.16	7.17	10.3	10.4	10.4			
						27.5	6.95	86.4	7.18	10.5									
						27.0	6.86	84.1	7.22	10.3									
17/03/15	1142-1200	20/Cloudy	Surface	1.0	18.0	27.1	27.1	6.89	6.88	84.4	84.3	7.29	7.26	10.5	10.4	10.4			
						27.1	6.89	84.4	7.29	10.5									
						27.2	6.79	83.2	7.57	11.0									
17/03/15	1142-1200	20/Cloudy	Middle	12.1	18.1	27.2	27.2	6.75	6.77	82.7	83.0	7.64	7.61	11.0	11.1	11.1			
						27.2	6.75	82.7	7.64	11.0									
						27.2	6.58	80.6	7.91	11.7									
17/03/15	1142-1200	20/Cloudy	Bottom	23.2	18.1	27.2	27.3	6.54	6.56	80.2	80.4	7.99	7.95	11.9	11.8	11.8			
						27.2	6.54	80.2	7.99	11.9									
						27.3	6.54	80.2	7.99	11.9									

Mid-Ebb Tide

Monitoring Station : TM-FC1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Value	Average
19/03/15	1248-1300	19/Cloudy	Surface	18.1	27.1	27.2	6.77	6.79	6.73	83.1	83.3	7.28	7.32	10.4	10.5	11.3		
					27.2	27.3	6.80	6.68	83.4	7.35	7.67	10.6	11.3					
					27.3	27.4	6.66	6.47	81.7	7.70	11.2	11.4						
21/03/15	1340-1358	23/Cloudy	Bottom	18.2	27.4	27.4	6.49	6.47	6.47	79.6	79.4	7.97	8.02	12.0	12.1	10.9		
					27.3	27.2	6.45	6.99	79.1	8.06	10.0	10.1	10.9					
					27.2	27.3	6.97	6.84	86.9	7.15	10.2	10.6						
24/03/15	1600-1615	19/Cloudy	Bottom	19.1	27.2	27.3	6.86	6.84	6.92	85.5	85.3	7.38	7.41	10.6	10.7	9.8		
					27.3	27.4	6.82	6.69	85.0	7.44	10.8	10.8	10.7					
					27.4	27.5	6.70	6.72	83.5	7.84	11.7	11.8						
26/03/15	1743-1800	20/Cloudy	Surface	20.8	27.5	28.3	6.67	6.72	6.52	83.1	86.6	7.91	5.96	9.0	8.9	11.3		
					28.8	28.5	6.73	7.20	86.4	5.94	10.0	10.1	11.3					
					28.8	28.5	6.70	7.18	81.5	7.03	10.2	10.3						
28/03/15	1812-1830	19/Cloudy	Bottom	20.2	29.0	29.0	6.34	6.32	7.01	81.0	81.3	7.06	8.06	12.0	12.1	10.5		
					29.0	29.2	6.30	6.21	6.21	81.0	7.21	7.23	12.2	10.5				
					29.1	28.3	6.23	7.44	7.35	80.1	7.25	10.5	10.5					
31/03/15	1643-1700	24/Cloudy	Surface	21.4	29.2	28.3	6.18	7.44	7.32	78.5	95.7	7.42	7.39	10.5	10.7	11.6		
					28.3	28.5	7.42	7.20	95.8	7.42	10.9	11.1	11.6					
					28.3	28.5	7.45	7.15	92.7	7.59	11.1	11.2						
28/03/15	1812-1830	19/Cloudy	Middle	19.3	28.5	28.3	7.21	7.07	7.11	92.4	92.6	7.66	7.63	11.3	11.2	10.5		
					28.5	28.3	7.18	7.07	90.6	8.02	12.0	12.1	10.5					
					28.6	28.6	6.98	7.01	89.8	8.10	12.2	12.1						
28/03/15	1812-1830	19/Cloudy	Bottom	19.5	28.6	28.6	7.04	6.96	6.96	90.6	90.2	8.02	8.06	12.0	12.1	10.5		
					28.6	28.1	6.98	7.15	90.8	8.10	12.2	12.1	10.5					
					28.0	28.1	7.14	7.07	91.0	7.12	10.1	10.2						
31/03/15	1643-1700	24/Cloudy	Surface	21.4	28.1	28.3	7.16	7.11	7.02	90.9	90.9	7.14	7.13	10.3	10.2	11.6		
					28.2	28.3	7.12	7.07	90.0	7.26	10.4	10.5	10.5					
					28.5	28.5	6.95	6.96	90.2	7.28	10.6	10.6						
31/03/15	1643-1700	24/Cloudy	Middle	21.5	28.4	28.5	6.95	6.96	7.02	88.7	88.8	7.45	7.46	10.6	10.7	11.6		
					28.4	28.3	6.97	7.11	88.9	7.47	10.8	10.7	10.7					
					28.7	28.2	7.12	7.11	94.0	7.47	10.8	10.8						
31/03/15	1643-1700	24/Cloudy	Bottom	21.6	28.3	28.3	7.10	6.92	7.02	93.7	93.9	7.55	7.51	11.0	10.9	11.6		
					28.5	28.5	6.93	6.92	91.5	7.76	11.5	11.7	11.6					
					28.5	28.7	6.91	6.78	91.2	7.83	11.9	12.2						
31/03/15	1643-1700	24/Cloudy	Bottom	21.6	28.7	28.7	6.79	6.78	6.78	89.6	89.4	8.12	8.16	12.2	12.3	11.6		
					28.7	28.7	6.76	6.78	89.2	8.19	12.4	12.4						

Mid-Ebb Tide

Monitoring Station : TM-FM1

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
03/03/15	1217-1235	19/Cloudy	Surface	17.4	26.8	26.9	7.02	7.00	6.92	85.1	84.8	7.16	7.19	10.2	10.3	10.6		
			Middle	17.4	26.9	6.98	6.85	83.2	7.38	7.40	10.4	10.6						
			Bottom	17.5	27.0	6.87	6.68	82.6	7.41	7.66	10.5	10.9						
05/03/15	1316-1333	19/Cloudy	Surface	17.5	27.1	27.2	6.69	6.91	6.83	81.1	83.8	7.22	7.25	10.4	10.5	10.8		
			Middle	17.6	27.0	6.93	6.76	82.2	7.44	7.48	10.6	10.7						
			Bottom	17.6	27.1	6.78	6.59	81.6	7.47	7.72	10.7	11.1						
07/03/15	1344-1400	19/Cloudy	Surface	17.8	27.2	27.3	6.66	7.11	7.01	80.1	79.9	7.72	7.75	9.9	10.0	10.4		
			Middle	17.9	26.9	7.12	6.91	86.5	6.93	7.26	10.1	10.4						
			Bottom	17.9	26.9	7.10	6.73	83.6	7.29	7.55	10.3	10.8						
10/03/15	1544-1602	19/Cloudy	Surface	18.9	27.0	27.1	6.72	6.87	6.79	81.7	83.5	7.18	7.22	10.3	10.4	10.8		
			Middle	18.9	26.9	6.85	6.71	81.3	7.43	7.46	10.5	10.7						
			Bottom	19.0	27.0	6.69	6.57	80.0	7.49	7.68	10.7	11.2						
12/03/15	1646-1703	17/Cloudy	Surface	18.7	27.0	27.0	6.55	6.87	6.82	79.6	83.7	7.72	7.70	10.0	9.9	10.4		
			Middle	18.8	27.1	6.88	6.76	83.8	7.21	7.25	9.8	10.4						
			Bottom	18.8	27.1	6.86	6.66	82.4	7.28	7.56	10.3	10.9						
14/03/15	1818-1830	17/Cloudy	Surface	18.1	27.2	27.3	6.75	6.94	6.81	81.0	86.1	7.00	7.12	10.2	10.4	10.5		
			Middle	18.3	27.2	6.93	6.67	86.2	7.13	7.25	10.6	10.6						
			Bottom	18.4	27.3	6.95	6.55	82.8	7.24	7.34	10.4	10.6						
17/03/15	1117-1135	20/Cloudy	Surface	18.0	27.3	27.4	6.68	6.81	6.74	81.4	81.5	7.33	7.34	10.5	10.6	10.9		
			Middle	18.0	27.4	6.54	6.68	81.6	7.35	7.68	10.7	11.4						
			Bottom	18.0	27.0	6.56	6.58	80.4	7.13	7.71	11.3	11.3						

Mid-Ebb Tide

Monitoring Station : TM-FM1

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/03/15	1230-1240	19/Cloudy	Surface	18.1	27.1	27.1	6.69	6.72	6.65	82.1	82.4	7.19	7.22	10.3	10.4	10.9		
					27.0	27.0	6.74	6.59	6.65	82.6	7.25	10.5						
					27.1	27.2	6.60	81.0	7.46	10.8								
21/03/15	1315-1332	23/Cloudy	Middle	18.1	27.2	27.3	6.58	6.84	6.75	80.7	80.9	7.54	7.50	10.9	10.9			
					27.2	27.3	6.51	6.75	6.49	79.9	7.80	11.6						
					27.3	27.3	6.47	6.75	6.49	79.4	7.74	11.4						
24/03/15	1540-1555	19/Cloudy	Surface	20.8	27.1	27.1	7.03	7.01	6.92	87.6	87.3	7.03	7.06	10.1	10.1			
					27.1	27.1	6.98	7.01	6.92	87.0	7.09	10.2						
					27.2	27.3	6.85	6.84	6.92	85.4	7.28	10.4						
26/03/15	1719-1735	20/Cloudy	Middle	20.2	27.3	27.3	6.82	6.84	6.75	85.0	85.2	7.35	7.32	10.5	10.5			
					27.3	27.3	6.82	6.84	6.75	85.0	7.35	10.6						
					27.4	27.4	6.76	6.75	6.75	84.2	7.61	11.1						
28/03/15	1748-1808	19/Cloudy	Surface	20.2	27.4	27.4	6.73	6.66	6.54	83.9	84.1	7.69	7.65	11.2	11.2			
					27.4	27.4	6.67	6.66	6.54	86.1	5.64	8.8						
					28.7	28.8	6.64	6.66	6.54	85.9	5.60	8.6						
31/03/15	1619-1636	24/Cloudy	Middle	21.5	28.9	28.9	6.40	6.42	6.20	82.4	82.7	6.87	6.86	9.9	9.8			
					28.9	28.9	6.44	6.42	6.20	82.9	6.85	9.7						
					29.1	29.1	6.17	6.20	6.20	79.4	6.94	9.8						
28/03/15	1748-1808	19/Cloudy	Surface	20.1	29.0	29.0	6.23	7.49	7.41	80.1	79.8	6.98	6.96	10.0	10.0			
					28.3	28.3	7.47	7.49	7.41	96.1	7.23	10.4						
					28.3	28.3	7.50	7.49	7.41	96.5	7.30	10.6						
26/03/15	1719-1735	20/Cloudy	Middle	20.2	28.4	28.5	7.36	7.34	7.17	94.7	94.5	7.53	7.57	10.7	10.8			
					28.5	28.5	7.32	7.34	7.17	94.2	7.60	10.9						
					28.5	28.6	7.18	7.17	7.17	92.4	7.89	11.6						
28/03/15	1748-1808	19/Cloudy	Bottom	20.2	28.6	28.6	7.15	7.17	7.16	92.0	92.2	7.95	7.92	11.8	11.7			
					28.6	28.6	7.15	7.17	7.16	92.0	7.95	11.8						
					28.1	28.2	7.21	7.20	7.16	91.8	7.24	10.3						
28/03/15	1748-1808	19/Cloudy	Surface	19.1	28.2	28.2	7.19	7.20	7.16	91.6	91.7	7.20	7.22	10.4	10.4			
					28.2	28.2	7.19	7.20	7.16	91.6	7.20	10.5						
					28.3	28.4	7.13	7.12	7.14	90.9	7.13	10.2						
31/03/15	1619-1636	24/Cloudy	Middle	21.5	28.4	28.4	7.13	7.12	7.05	91.1	91.0	7.15	7.14	10.3	10.3			
					28.4	28.4	7.11	7.12	7.05	91.1	7.15	10.4						
					28.5	28.5	7.00	6.99	6.99	89.3	7.06	10.0						
28/03/15	1748-1808	19/Cloudy	Bottom	19.4	28.5	28.5	6.98	6.99	6.84	89.0	89.2	7.08	7.07	10.1	10.1			
					28.5	28.5	6.98	6.99	6.84	89.0	7.08	10.2						
					28.2	28.3	7.11	7.10	7.05	93.8	7.40	10.7						
31/03/15	1619-1636	24/Cloudy	Surface	21.4	28.3	28.3	7.09	7.10	7.05	93.5	93.7	7.49	7.45	10.8	10.8			
					28.3	28.3	7.09	7.10	7.05	93.5	7.49	10.9						
					28.4	28.4	7.02	7.01	7.05	92.6	7.65	12.2						
31/03/15	1619-1636	24/Cloudy	Middle	21.5	28.5	28.5	6.99	7.01	6.84	92.2	92.4	7.73	7.69	12.3	12.3			
					28.5	28.5	6.99	7.01	6.84	92.2	7.73	12.4						
					28.5	28.6	6.85	6.84	6.84	90.4	7.79	12.6						
31/03/15	1619-1636	24/Cloudy	Bottom	21.5	28.6	28.6	6.82	6.84	6.84	90.4	90.2	7.88	7.84	12.7	12.7			
					28.6	28.6	6.82	6.84	6.84	90.4	7.88	12.8						
					28.6	28.6	6.82	6.84	6.84	90.4	7.88	12.8						

Mid-Ebb Tide

Monitoring Station : TM-FM2

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	
03/03/15	1153-1210	19/Cloudy	Surface	17.4	26.8	26.8	6.97	6.96	6.90	84.4	84.3	7.30	7.28	10.5	10.4	10.8		
					26.8	26.8	6.84	6.85	6.90	83.1	82.9	7.25	7.49	10.3	10.8			
					26.9	26.9	6.86	6.83	6.85	82.7	7.77	7.52	7.81	10.7	10.9			
05/03/15	1253-1310	19/Cloudy	Bottom	17.4	27.1	27.2	6.70	6.69	6.69	81.2	81.0	7.77	7.81	11.0	11.1	10.9		
					27.2	27.2	6.67	6.87	6.60	80.8	7.84	7.81	11.2	11.3				
					26.8	26.9	6.88	6.87	6.81	83.4	7.36	7.34	10.5	10.4				
07/03/15	1322-1337	19/Cloudy	Surface	17.8	26.8	26.8	7.08	7.06	6.97	83.1	83.3	7.31	7.34	10.3	10.4	10.5		
					26.9	27.0	6.85	6.76	6.81	82.1	81.9	7.52	7.55	10.6	10.5			
					27.0	27.0	6.90	6.87	6.65	83.9	7.34	7.27	7.31	10.4	10.9			
10/03/15	1522-1538	19/Cloudy	Bottom	17.9	27.1	27.2	6.66	6.65	6.65	81.0	80.8	7.71	7.75	11.1	11.1	11.1		
					27.2	27.2	6.63	6.85	6.79	80.6	7.78	7.78	11.4	11.3				
					26.8	26.8	6.86	6.85	6.66	86.1	7.05	7.02	10.1	10.0				
12/03/15	1623-1640	17/Cloudy	Surface	18.8	26.8	26.8	6.83	6.85	6.79	83.1	83.3	7.42	7.38	10.5	10.7	11.1		
					26.9	26.9	6.74	6.73	6.66	82.0	81.8	7.56	7.59	10.9	11.0			
					27.0	27.1	6.71	6.74	6.66	81.6	7.62	7.62	11.1	11.1				
14/03/15	1754-1812	17/Cloudy	Bottom	18.9	27.0	27.0	6.67	6.66	6.66	81.1	80.9	7.86	7.89	11.3	11.5	10.7		
					27.1	27.1	6.64	6.91	6.82	80.7	7.91	7.91	11.7	11.5				
					26.8	26.9	6.89	6.91	6.82	83.9	7.16	7.13	10.2	10.1				
17/03/15	1054-1111	20/Cloudy	Surface	18.1	27.2	27.2	6.92	6.83	6.78	84.1	84.0	7.09	7.13	10.0	10.1	10.5		
					27.1	27.1	6.75	6.74	6.66	82.1	82.0	7.41	7.37	10.7	10.6			
					27.2	27.3	6.72	6.74	6.56	81.8	7.33	7.33	10.5	10.5				

Mid-Ebb Tide

Monitoring Station : TM-FM2

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	
19/03/15	1215-1225	19/Cloudy	Surface	17.9	27.0	27.1	6.75	6.74	6.69	82.8	82.7	7.16	7.13	10.3	10.2	11.0		
					27.1	27.1	6.73	6.65	82.6	81.6	7.10	7.53	10.1	11.0				
					27.2	27.2	6.66	6.63	81.7	81.4	7.48	7.57	10.9	11.1				
21/03/15	1253-1310	23/Cloudy	Bottom	18.1	27.3	27.3	6.54	6.52	6.52	80.2	80.0	7.83	7.87	11.7	11.8	10.9		
					27.2	27.1	6.50	7.10	88.2	88.4	7.90	7.15	11.9	10.2				
					27.1	27.1	7.08	7.10	88.2	88.4	7.11	7.15	10.2	10.4				
24/03/15	1520-1535	19/Cloudy	Middle	19.0	27.3	27.3	6.86	6.85	6.97	85.5	85.3	7.37	7.41	10.7	10.8	10.9		
					27.3	27.3	6.83	6.85	85.1	85.3	7.44	7.41	10.9	10.8				
					27.4	27.4	6.72	6.70	83.7	83.5	7.70	7.74	11.4	11.5				
26/03/15	1655-1712	20/Cloudy	Surface	20.0	28.7	28.7	6.71	6.73	6.54	86.5	86.7	5.43	5.42	8.7	8.6	9.5		
					28.7	28.7	6.74	6.73	86.9	86.7	5.40	5.42	8.5	8.6				
					29.0	29.0	6.36	6.35	81.7	81.6	6.71	6.73	9.8	9.9				
28/03/15	1724-1742	19/Cloudy	Bottom	20.2	29.0	29.0	6.33	6.22	6.22	81.4	81.6	6.74	6.73	10.0	10.0	11.5		
					29.1	29.1	6.20	6.22	80.2	80.0	6.90	6.93	10.0	10.0				
					29.1	29.1	6.24	6.22	80.2	80.0	6.96	6.93	10.0	10.0				
31/03/15	1554-1611	24/Cloudy	Surface	21.4	28.3	28.4	7.34	7.33	7.27	94.4	94.2	7.43	7.48	10.7	10.9	11.3		
					28.4	28.4	7.31	7.21	94.0	92.8	7.52	7.72	11.1	11.4				
					28.4	28.5	7.23	7.04	93.0	90.6	7.68	7.76	11.2	11.6				
28/03/15	1724-1742	19/Cloudy	Middle	19.3	28.5	28.5	7.19	6.94	7.01	92.5	88.5	7.75	7.42	11.6	10.8	10.8		
					28.5	28.5	7.03	6.84	90.4	87.3	8.05	7.59	12.1	11.1				
					28.6	28.6	7.05	6.84	90.7	87.3	8.11	7.59	12.3	12.2				
28/03/15	1724-1742	19/Cloudy	Bottom	19.4	28.6	28.6	6.85	6.84	6.84	87.4	87.3	7.58	7.59	11.0	11.1	10.8		
					28.5	28.5	6.83	6.84	87.2	87.3	7.60	7.59	11.2	11.2				
					28.0	28.1	7.09	7.08	90.3	90.2	7.35	7.34	10.6	10.5				
28/03/15	1724-1742	19/Cloudy	Surface	21.4	28.1	28.1	7.07	7.16	7.11	90.0	94.4	7.33	7.42	10.4	10.8	11.3		
					28.2	28.2	6.93	6.94	94.2	94.4	7.39	7.42	10.7	10.8				
					28.2	28.2	6.95	6.94	94.6	94.4	7.45	7.42	10.9	10.8				
31/03/15	1554-1611	24/Cloudy	Middle	21.5	28.4	28.4	7.08	7.07	7.11	93.4	93.3	7.60	7.64	11.1	11.3	11.3		
					28.4	28.4	7.05	7.07	93.1	93.3	7.67	7.64	11.5	11.5				
					28.5	28.5	6.87	6.86	90.6	90.4	7.93	7.89	11.9	11.9				
31/03/15	1554-1611	24/Cloudy	Bottom	21.6	28.5	28.5	6.84	6.86	6.86	90.2	90.4	7.84	7.89	11.9	11.9	11.3		
					28.5	28.5	6.84	6.86	90.2	90.4	7.84	7.89	11.9	11.9				
					28.5	28.5	6.84	6.86	90.2	90.4	7.84	7.89	11.9	11.9				

Mid-Ebb Tide

Monitoring Station : TM-FC2

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
03/03/15	1130-1147	19/Cloudy	Surface	17.3	26.7	26.8	6.88	6.91	6.83	83.4	83.7	7.41	7.39	10.6	10.5	10.8		
					26.8	27.0	6.93	6.76	84.0	7.50	10.4							
			Middle	17.4	26.9	27.0	6.77	6.64	81.6	7.58	10.8							
					27.0	27.1	6.74	6.64	80.5	7.80	11.0							
			Bottom	17.4	27.1	27.1	6.65	6.62	80.2	7.89	11.2							
					27.1	26.8	6.79	6.82	82.4	7.47	10.8							
05/03/15	1230-1247	19/Cloudy	Surface	17.4	26.9	26.9	6.84	6.82	6.74	83.0	82.7	7.42	7.45	10.6	10.7	11.1		
					27.0	27.1	6.68	6.67	81.0	7.56	10.9							
			Middle	17.4	27.0	27.1	6.65	6.65	80.6	7.64	11.1							
					27.1	27.2	6.56	6.55	79.5	7.86	11.6							
			Bottom	17.5	27.1	27.2	6.53	6.53	79.1	7.95	11.8							
					27.1	26.7	6.93	6.92	84.3	7.04	10.0							
07/03/15	1300-1316	19/Cloudy	Surface	17.8	26.8	26.8	6.90	6.80	6.86	83.9	84.1	7.12	7.08	10.2	10.1	10.6		
					26.8	26.9	6.81	6.80	82.8	7.38	10.5							
			Middle	17.8	26.9	26.9	6.78	6.78	82.4	7.44	10.7							
					27.0	27.1	6.70	6.69	81.5	7.60	11.1							
			Bottom	17.9	27.0	27.1	6.67	6.67	81.1	7.67	11.3							
					27.1	26.7	6.79	6.78	82.6	7.23	10.4							
10/03/15	1500-1516	19/Cloudy	Surface	18.8	26.8	26.8	6.77	6.78	6.73	82.3	82.5	7.30	7.27	10.6	10.5	10.9		
					26.8	26.9	6.69	6.68	81.4	7.41	10.8							
			Middle	18.9	26.9	26.9	6.66	6.66	81.0	7.48	10.8							
					27.0	27.0	6.50	6.49	79.0	7.67	11.2							
			Bottom	19.0	27.0	27.0	6.47	6.49	78.7	7.72	11.4							
					26.8	26.8	6.84	6.83	83.2	7.05	10.0							
12/03/15	1600-1617	17/Cloudy	Surface	18.7	26.7	26.8	6.81	6.83	6.75	82.9	83.1	7.11	7.08	10.2	10.1	10.5		
					26.7	27.0	6.69	6.68	81.4	7.27	10.5							
			Middle	18.8	27.0	27.1	6.67	6.68	81.2	7.35	10.7							
					27.1	27.2	6.62	6.61	80.6	7.52	10.9							
			Bottom	18.8	27.2	27.3	6.60	6.61	80.3	7.59	10.9							
					27.3	27.0	6.88	6.89	85.4	7.13	10.2							
14/03/15	1730-1748	17/Cloudy	Surface	18.0	27.0	27.0	6.90	6.89	6.81	85.6	85.5	7.11	7.12	10.4	10.3	10.5		
					27.1	27.2	6.73	6.72	83.7	7.27	10.4							
			Middle	18.2	27.2	27.2	6.71	6.72	83.5	7.29	10.6							
					27.3	27.3	6.66	6.67	82.9	7.34	10.5							
			Bottom	18.4	27.3	27.3	6.68	6.67	83.0	7.36	10.7							
					26.9	26.9	6.88	6.87	84.3	7.24	10.5							
17/03/15	1030-1047	20/Cloudy	Surface	17.9	26.9	26.9	6.85	6.87	6.83	83.9	84.1	7.16	7.20	10.3	10.4	11.1		
					27.0	27.1	6.80	6.79	83.0	7.50	11.0							
			Middle	18.0	27.0	27.1	6.77	6.77	83.0	7.58	11.2							
					27.1	27.2	6.68	6.67	81.8	7.86	11.7							
			Bottom	18.1	27.1	27.2	6.65	6.67	81.5	7.93	11.9							
					27.2	27.2	6.65	6.67	81.5	7.93	11.9							

Mid-Ebb Tide

Monitoring Station : TM-FC2

Date	Sampling Duration	Ambient Temp (°C) / Weather Condition	Monitoring Depth (m)	Temp (°C)	Salinity (ppt)		Dissolved Oxygen (mg/L)			Dissolved Oxygen Saturation (%)			Turbidity (NTU)			Suspended Solids (mg/L)		
					Value	Average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average	Value	Average	Depth-average
19/03/15	1200-1210	19/Cloudy	Surface	18.0	26.9	27.0	6.79	6.78	6.74	83.2	83.1	7.30	7.26	10.6	10.5	11.2		
					27.0	27.0	6.76	6.70	82.9	7.22	10.4							
					27.2	27.2	6.71	6.68	82.3	7.56	11.0							
21/03/15	1230-1247	23/Cloudy	Middle	18.1	27.1	27.2	6.68	6.70	6.58	82.0	82.2	7.64	7.60	11.2	11.1	10.7		
					27.2	27.2	6.59	6.58	80.8	7.92	12.0							
					27.3	27.3	6.56	7.99	80.5	7.99	12.0							
24/03/15	1500-1515	19/Cloudy	Surface	18.2	27.1	27.1	7.05	7.03	6.96	87.9	87.6	7.08	7.11	10.2	10.2	9.3		
					27.1	27.1	7.00	6.90	87.2	7.14	10.2							
					27.2	27.3	6.93	6.87	86.4	7.30	10.5							
26/03/15	1630-1648	20/Cloudy	Middle	18.9	27.3	27.3	6.87	6.77	6.77	85.6	86.0	7.39	7.35	10.7	10.6	11.3		
					27.4	27.4	6.79	6.75	84.6	7.64	11.2							
					27.4	27.4	6.75	6.80	84.1	7.72	11.4							
28/03/15	1700-1718	19/Cloudy	Surface	20.7	28.7	28.7	6.82	6.80	6.10	87.9	87.7	5.57	5.54	8.8	8.7	10.7		
					28.7	28.7	6.78	7.41	95.1	5.51	8.6							
					29.0	29.0	6.50	7.26	95.4	6.21	9.5							
31/03/15	1530-1547	24/Cloudy	Bottom	20.4	29.0	29.0	6.47	6.10	6.10	83.2	83.4	6.18	6.20	9.3	9.4	11.6		
					29.0	29.1	6.12	6.08	78.2	6.68	9.9							
					29.1	29.1	6.08	7.42	78.2	6.64	9.7							
28/03/15	1630-1648	20/Cloudy	Surface	20.1	28.3	28.3	7.39	7.41	7.33	95.1	95.3	7.39	7.42	10.6	10.7	11.3		
					28.3	28.3	7.42	7.26	93.5	7.62	11.2							
					28.4	28.4	7.27	7.09	93.3	7.70	11.4							
28/03/15	1700-1718	19/Cloudy	Middle	20.1	28.4	28.4	7.25	7.20	7.15	91.0	91.3	7.94	7.98	11.8	11.9	10.7		
					28.4	28.4	7.25	7.10	91.5	8.01	12.0							
					28.5	28.5	7.07	7.20	91.5	7.22	10.5							
28/03/15	1700-1718	19/Cloudy	Bottom	20.2	28.5	28.5	7.11	7.09	7.09	91.0	91.6	7.22	7.21	10.5	10.4	10.6		
					28.5	28.5	7.11	7.10	91.7	7.20	10.3							
					28.1	28.2	7.19	7.10	90.6	7.36	10.5							
31/03/15	1530-1547	24/Cloudy	Surface	19.0	28.3	28.3	7.09	6.92	6.92	90.4	90.5	7.38	7.37	10.7	10.6	11.6		
					28.3	28.3	7.09	6.92	88.4	7.49	11.0							
					28.4	28.4	6.93	7.03	88.2	7.51	11.0							
31/03/15	1530-1547	24/Cloudy	Middle	19.2	28.2	28.2	7.04	7.03	7.07	92.9	92.7	7.56	7.60	11.1	11.2	12.1		
					28.2	28.2	7.01	7.12	92.5	7.64	11.3							
					28.3	28.4	7.11	7.13	93.8	7.79	11.5							
31/03/15	1530-1547	24/Cloudy	Bottom	21.4	28.4	28.4	7.13	6.90	6.90	94.1	94.0	8.85	8.82	11.7	11.6	12.1		
					28.4	28.5	6.92	6.88	91.3	8.04	12.0							
					28.5	28.5	6.88	6.88	90.8	8.11	12.2							

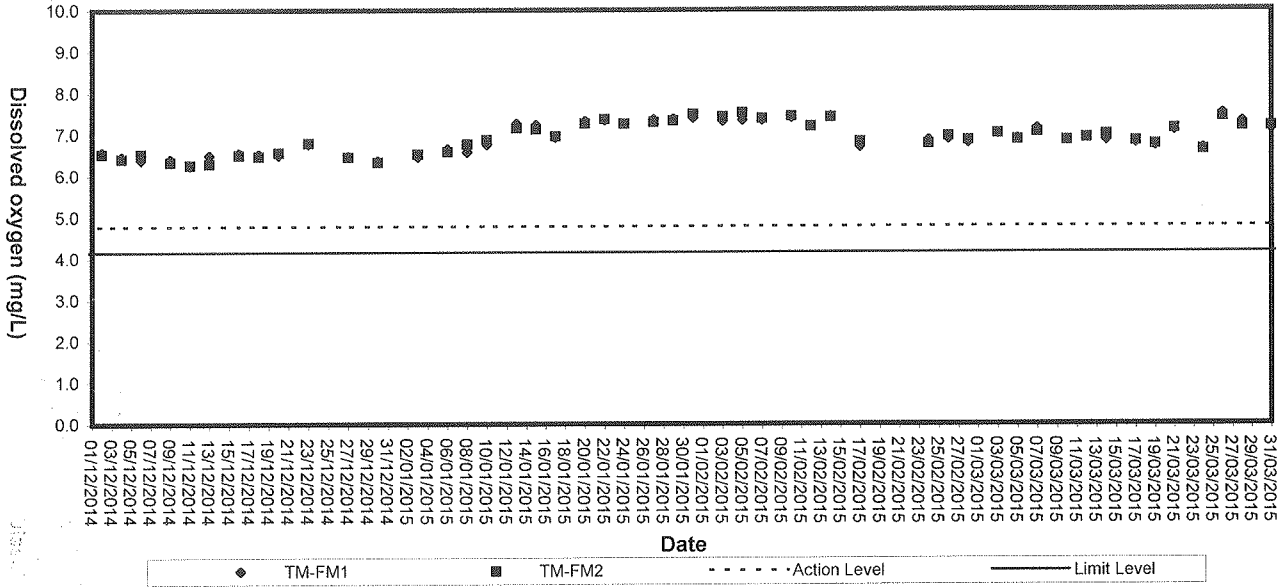


Appendix C3

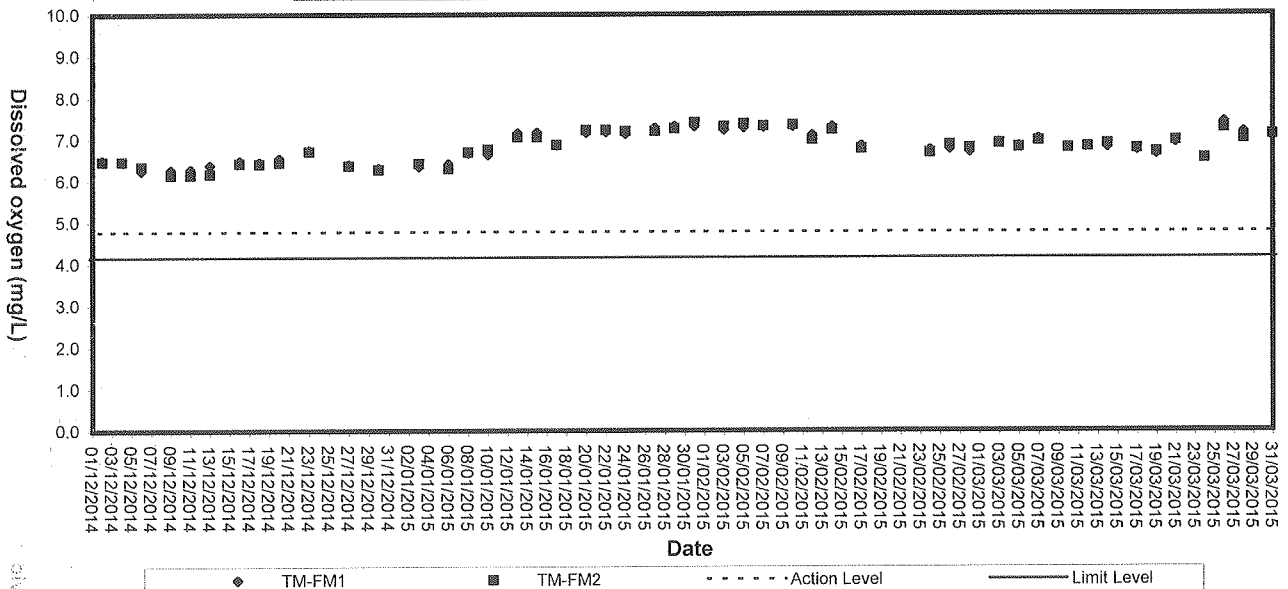
Graphical Plots of Impact Marine Water Quality Monitoring Data



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

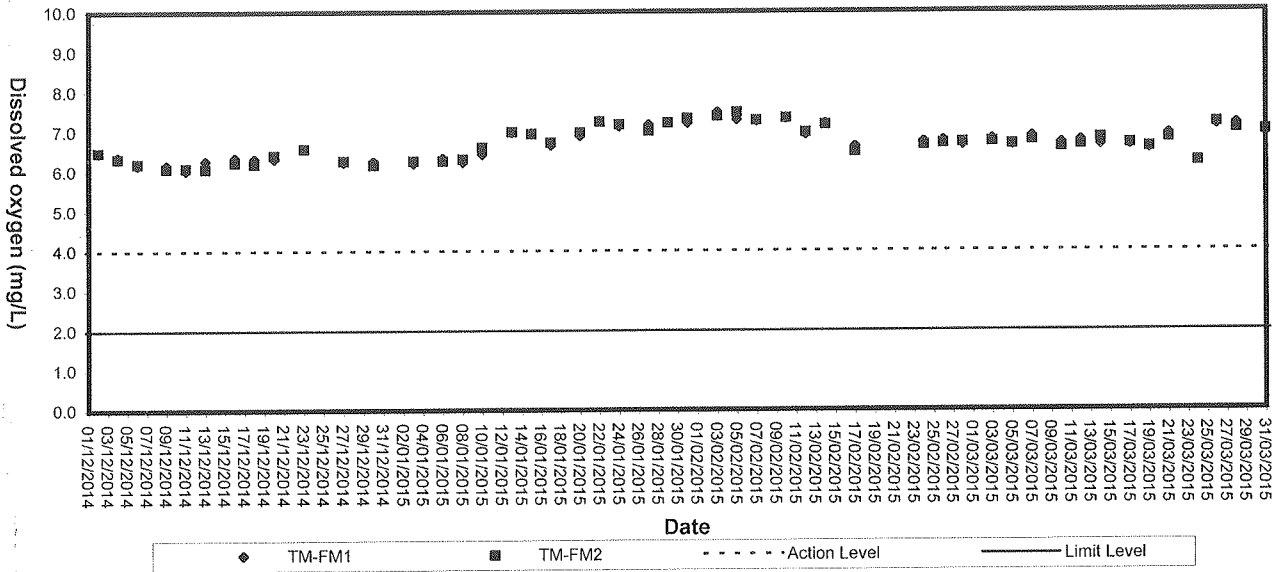


Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

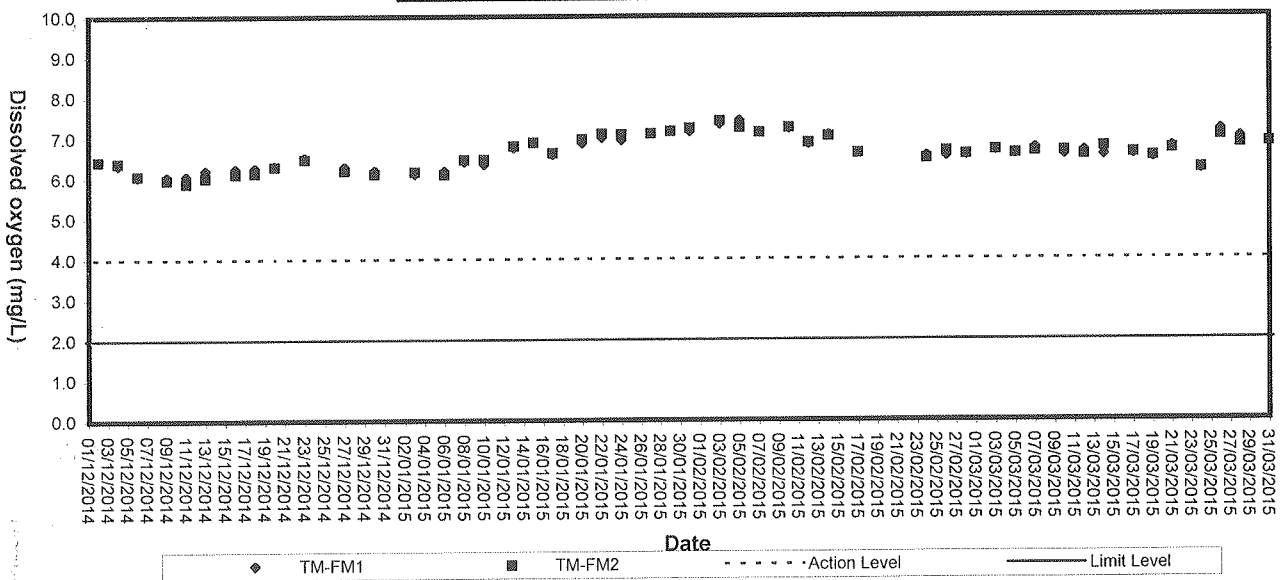




Dissolved Oxygen (Bottom) at Mid-Flood Tide

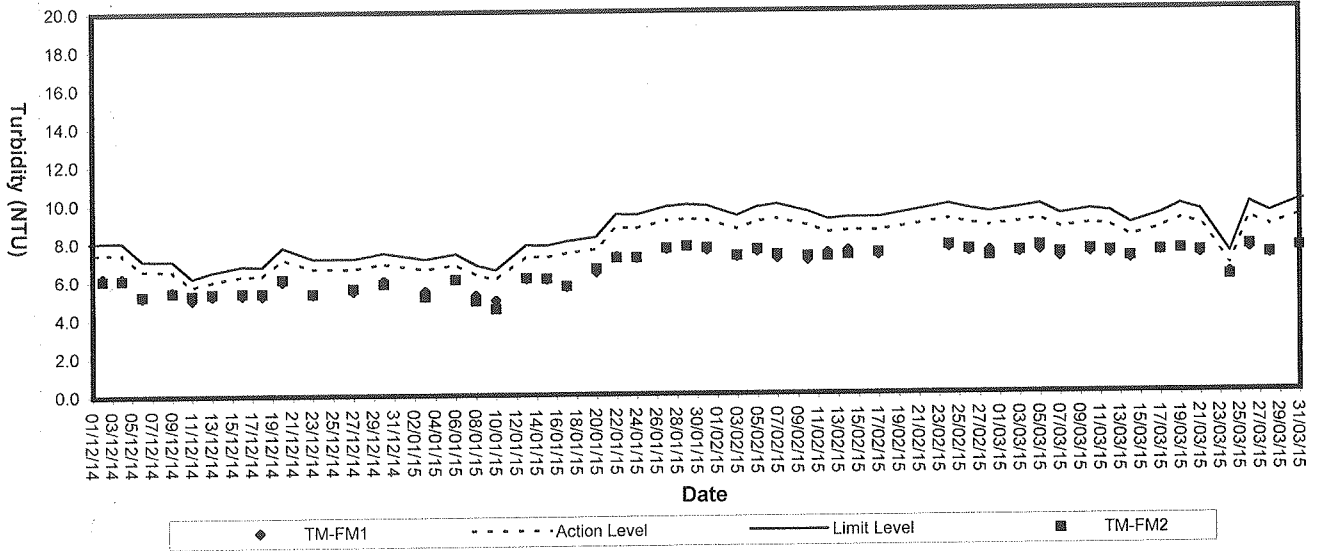


Dissolved Oxygen (Bottom) at Mid-Ebb Tide

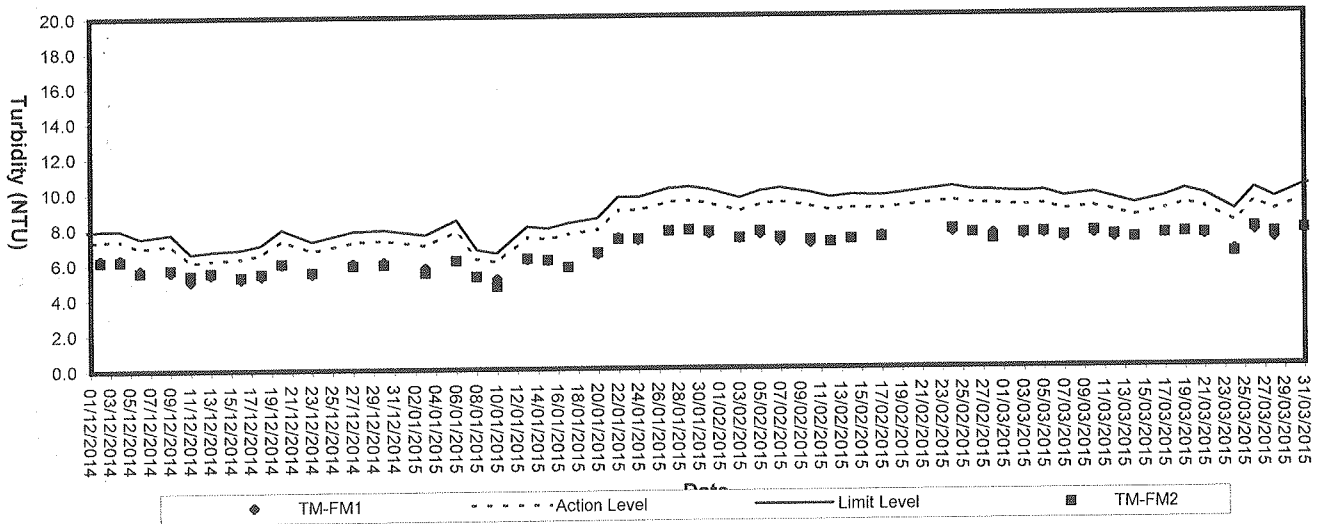




Turbidity (Depth-average) at Mid-Flood Tide

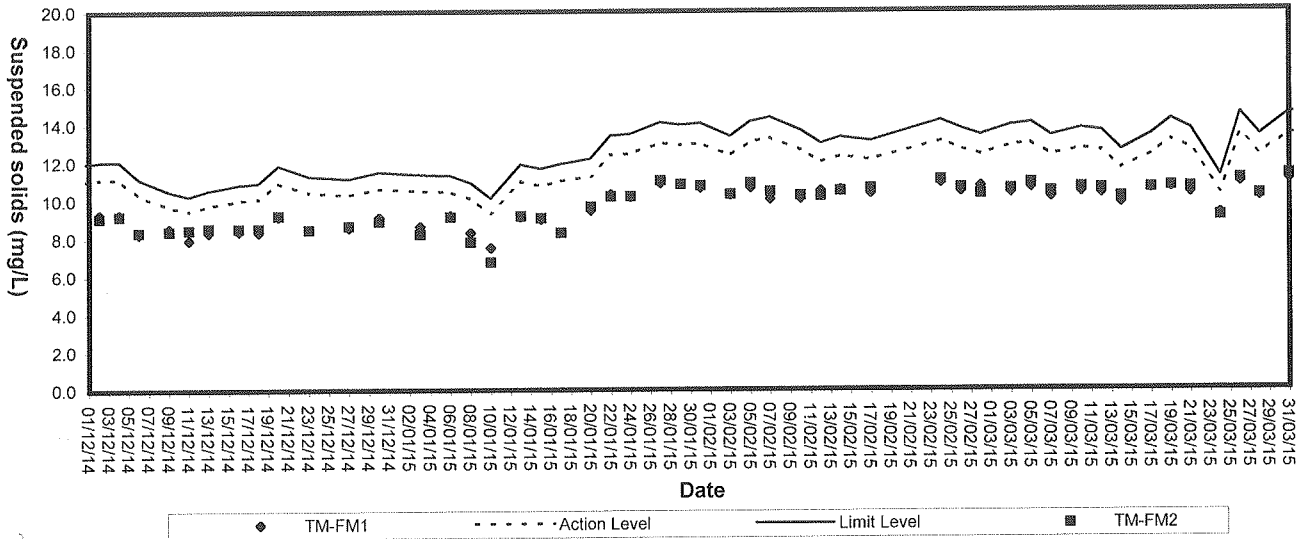


Turbidity (Depth-average) at Mid-Ebb Tide

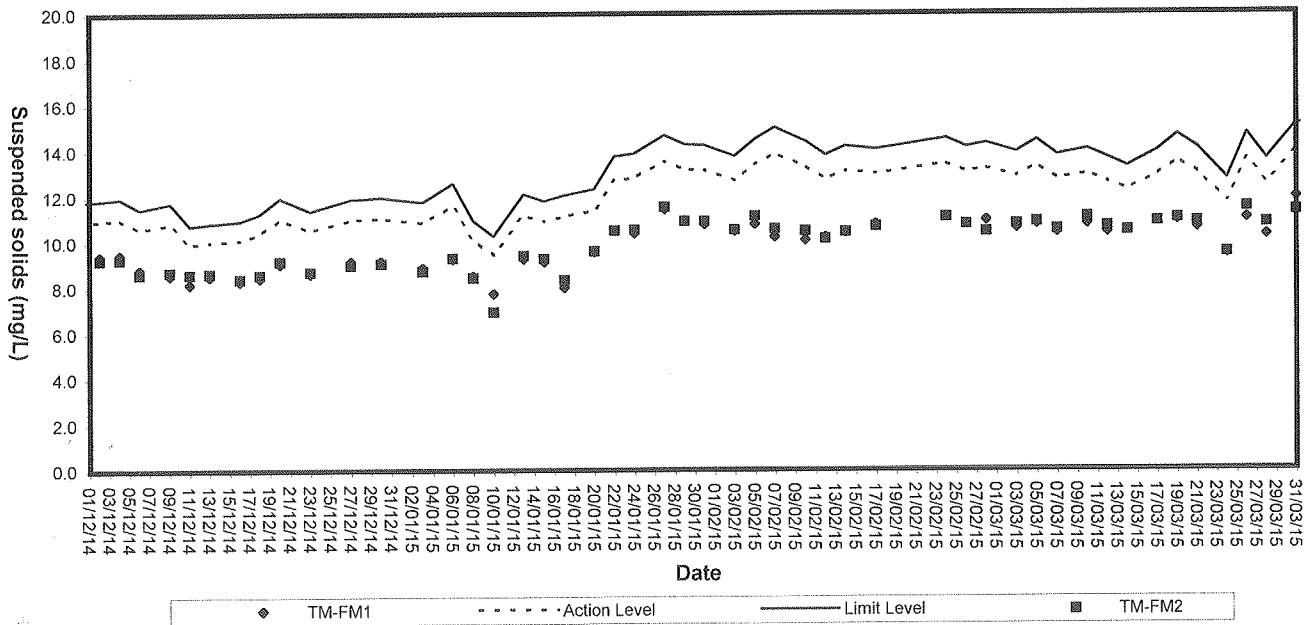




Suspended solids (Depth-average) at Mid-Flood Tide



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





Appendix D1

Calibration Certificates for Impact Noise Monitoring Equipments



Calibration Certificate

Certificate No. 408019

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. : Q43527

Date of receipt : 30-Oct-14

Item Tested

Description : Sound Level Calibrator (ET/EN/002/01)

Manufacturer : Rion

Model : NC-73

Serial No. : 10196943

Test Conditions

Date of Test : 1-Nov-14

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

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:


Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	405316	NIM-PRC & SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR
S041	Universal Counter	405317	SCL-HKSAR
S206	Sound Level Meter	405322	SCL-HKSAR

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
Dorothy Cheuk

Approved by : 
Steve Kwan

Date: 1-Nov-14

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. 408019

Page 2 of 2 Pages

Results :

1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	94.1 dB	± 1 dB

Uncertainty : ± 0.2 dB

2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.986 kHz	± 2 %

Uncertainty : ± 0.1 %

3. Level Stability : 0.0 dB

Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.3 %

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 : 1002 hPa

----- END -----



Calibration Certificate

Certificate No. 408021

Page 1 of 3 Pages

Customer : ETS-Testconsult Limited

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

Order No. : Q43527

Date of receipt : 30-Oct-14

Item Tested

Description : Precision Integrating Sound Level Meter (ET/EN/003/13)

Manufacturer : Rion

Model : NL-31

Serial No. : 00593620

Test Conditions

Date of Test : 1-Nov-14

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z01, IEC 651 and IEC 804.

Test Results

All results were within the IEC 651 Type1 and IEC 804 Type1 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	C127181	SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
Dorothy Cheuk

Approved by : 
Steve Kwan

Date: 1-Nov-14



Calibration Certificate

Certificate No. 408021

Page 2 of 3 Pages

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L _A	Fast	94.0	93.8
		Slow		93.8
	L _C	Fast		93.8
	L _p	Fast		93.8
30 – 120	L _A	Fast	94.0	93.7
		Slow		93.7
	L _C	Fast		93.8
	L _p	Fast		93.8
30 – 120	L _A	Fast	114.0	113.8
		Slow		113.8
	L _C	Fast		113.8
	L _p	Fast		113.8

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	113.8	+0.1	± 0.7 dB
130	104.0	103.8	+0.1	
120	94.0	93.7 (Ref.)	- -	
110	84.0	83.7	0.0	
100	74.0	73.7	0.0	
90	64.0	63.7	0.0	
80	54.0	53.9	+0.2	

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. 408021

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3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.7	0.0	± 0.4 dB
	94.0	93.7 (Ref.)	--	
	95.0	94.7	0.0	± 0.2 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting - A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.7	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.3	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.3	- 16.1 dB, ± 1 dB
250 Hz	- 8.8	- 8.6 dB, ± 1 dB
500 Hz	- 3.3	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+ 1.2	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.1	+ 1.0 dB, ± 1 dB
8 kHz	- 1.2	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	- 6.8	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
1/10 ²	40.0	40.0	
1/10 ³	40.0	40.1	± 1.0 dB
1/10 ⁴	40.0	40.1	

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 : 1002 hPa
 4. The UUT was adjusted with the supplied sound calibrator at the reference sound pressure level before the calibration.

----- END -----



Calibration Certificate

Certificate No. 403958

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Customer : ETS-Testconsult Limited

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

Order No. : Q41813

Date of receipt : 11-Jun-14

Item Tested

Description : Sound Level Meter (ET/EN/003/15)

Manufacturer : Rion

Model : NL-52

Serial No. : 00620792

Test Conditions

Date of Test : 23-Jun-14

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : Z01, IEC 61672.

Test Results

All results were within the IEC 61672 Type1 specification.

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


Main Test equipment used:

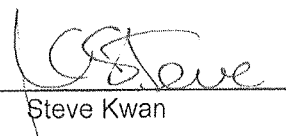
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C127181	SCL-HKSAR
S205	Ref. Sound Level Calibrator	PHCO40002	SCL-HKSAR

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

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

Calibrated by : 
Dorothy Cheuk

Approved by : 
Steve Kwan

Date: 21-Jun-14

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. 403958

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Results :

1. Self-generated noise: 13.9 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	93.7
		S	OFF		93.7
	C	F	OFF		93.7
	Z	F	OFF		93.7
	A	F	OFF	114.0	113.8
			OFF		113.8
		C	OFF		113.8
		Z	OFF		113.8

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	- 39.5	- 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	- 8.6	- 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	+1.0	+ 1.2 dB, \pm 1.6 dB
4 kHz	+0.7	+ 1.0 dB, \pm 1.6 dB
8 kHz	- 1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	- 8.6	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : \pm 0.1 dB



Calibration Certificate

Certificate No. 403958

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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	93.7 (Ref.)	--	± 0.4 dB
C	94.0	93.7	0.0	
Z	94.0	93.7	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	93.7 (Ref.)	--	± 0.3 dB
Slow	94.0	93.7	0.0	
Time-averaging	94.0	93.7	0.0	

Uncertainty : ± 0.1 dB

5. Level linearity on the reference level range

UUT Range	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
30-130 dB (Ref Level)	129.0	128.7	-0.1	± 1.1 dB
	124.0	123.7	-0.1	
	119.0	118.7	-0.1	
	114.0	113.8 (Ref)	--	
	109.0	108.7	-0.1	
	104.0	103.8	0.0	
	99.0	98.7	-0.1	
	94.0	93.7	-0.1	
	89.0	88.8	0.0	
	84.0	83.8	0.0	
	79.0	78.8	0.0	
	74.0	73.8	0.0	
	69.0	68.8	0.0	
	64.0	63.7	-0.1	
	59.0	58.8	0.0	
	54.0	53.7	-0.1	
	49.0	48.8	0.0	
44.0	43.8	0.0		

Uncertainty : ± 0.1 dB



Calibration Certificate

Certificate No. **403958**

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6. Toneburst response (4kHz)

UUT Setting	Tone Burst Duration(ms)	UUT Reading(dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	Steady	127.0(Ref)	--	--
	200	126.0	-1.0	-1.0 ± 0.8dB
	2	109.0	-18.0	-18.0, +1.3 dB ~ -1.8 dB
	0.25	100.0	-27.0	-27.0, +1.3 dB ~ -3.3 dB
Slow	Steady	127.0(Ref)	--	--
	200	119.6	-7.4	-7.4 ± 0.8dB
	2	100.0	-27.0	-27.0, +1.3 dB ~ -3.3 dB
Time averaging	Steady	127.0(Ref)	--	--
	200	120.3	-6.7	-7.0±0.8dB
	2	100.6	-26.4	-27.0, +1.3 dB ~ -1.8 dB
	0.25	90.9	-36.1	-36.0, +1.3 dB ~ -3.3 dB

Uncertainty : ± 0.1 dB

7. Overload indication (30-130 dB range, A-weighted, Time-average, 4kHz)

UUT Reading at overload (dB)		Difference (dB)	IEC 61672 Type 1 Spec.
+ ve one half cycle	- ve one half cycle		
136.0	136.2	0.2	< 1.8 dB

The overload indicator latched on until reset

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 : 991 hPa.

4. Preamplifier model : NH-25 , S/N : 20852

5. Firmware Version: 1.2

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 -----



Appendix D2

Impact Noise Monitoring Results

Day-time Noise Monitoring

Monitoring Location: TM-RN1 *

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L _{eq(30min)}	L ₁₀	L ₉₀		
03/03/15	08:40	57.8	58.4	53.3	0.6	Cloudy
05/03/15	11:25	57.1	58.8	52.4	0.4	Cloudy
10/03/15	08:30	54.9	56.2	53.4	0.6	Cloudy
12/03/15	11:00	56.4	58.2	52.2	0.3	Drizzle
17/03/15	11:00	56.6	57.9	52.2	0.3	Cloudy
19/03/15	13:05	54.9	57.0	50.2	0.3	Fine
24/03/15	11:20	57.1	58.8	52.4	0.4	Cloudy
26/03/15	09:45	56.3	57.9	52.2	0.3	Cloudy
31/03/15	08:35	56.6	57.1	54.3	0.4	Cloudy

Remark: Since Lands Department did not approve us to enter their own area where the noise monitoring stations TM-N1 located due to the security, noise monitoring was carried out at noise monitoring stations TM-RN1 (refer to the figure 3 attached) in this reporting month.

Monitoring Location: TM-RN2 *

Date	Start Sampling Time (hh:mm)	Noise Level dB (A)			Wind Speed (m/s)	Weather Condition
		L _{eq(30min)}	L ₁₀	L ₉₀		
03/03/15	08:45	57.3	58.1	53.1	0.6	Cloudy
05/03/15	11:30	57.6	59.5	63.1	0.5	Cloudy
10/03/15	08:35	54.2	55.9	53.1	0.6	Cloudy
12/03/15	11:05	57.5	59.0	53.0	0.3	Drizzle
17/03/15	11:05	57.1	58.8	53.0	0.4	Cloudy
19/03/15	13:40	56.3	58.1	51.9	0.3	Fine
24/03/15	11:25	57.5	59.0	52.8	0.5	Cloudy
26/03/15	09:50	57.0	58.4	51.9	0.3	Cloudy
31/03/15	08:40	56.3	57.6	54.8	0.4	Cloudy

Remark: Since Lands Department did not approve us to enter their own area where the noise monitoring stations TM-N2 located due to the security, noise monitoring was carried out at two noise monitoring stations TM-RN2 (refer to the figure 3 attached) in this reporting month.

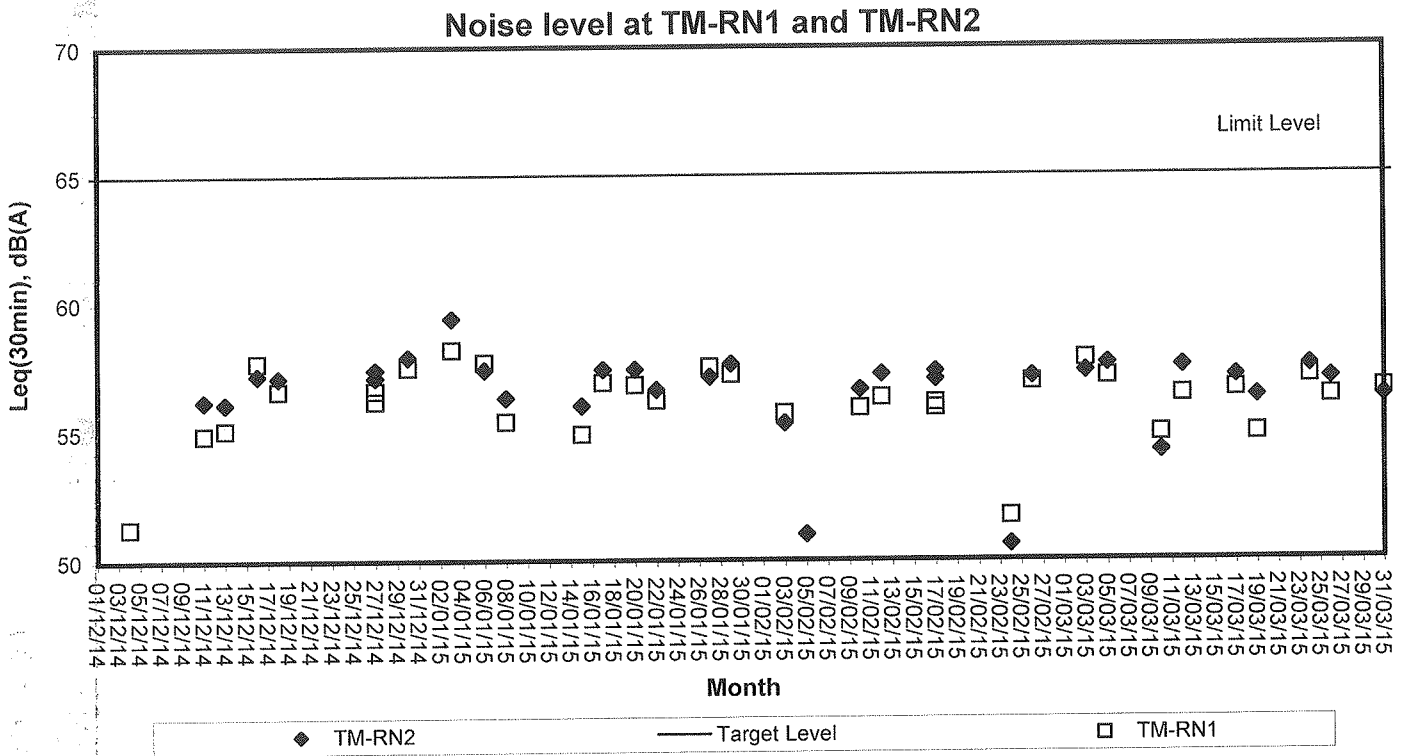


Appendix D3

Graphical Plots of Impact Noise Monitoring Data



Noise Monitoring (Day-time)





Appendix E

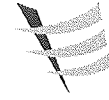
Weather Condition

Daily Extract of Meteorological Observations , March 2015 - Tuen Mun

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)					
1	***	21.2	19.2	16.7	12.9	68	0	***	***
2	***	20.3	18.1	17.3	14.5	80	0	***	***
3	***	22.6	20	17.5	17.9	88	0	***	***
4	***	18.8	17.1	15.1	15.4	90	2	***	***
5	***	18.7	17.8	16.9	15.9	89	0	***	***
6	***	18.4	17.6	16.1	16.3	92	0	***	***
7	***	20	17.7	15.1	15.9	89	0	***	***
8	***	21.3	19.5	17.9	16.9	85	0	***	***
9	***	26.2	21.6	17.6	18.4	83	0	***	***
10	***	20.7	18.4	16.2	12.1	68	0	***	***
11	***	18.2	16.5	15.1	13	80	0	***	***
12	***	16.7	15.2	13.9	13.8	91	6	***	***
13	***	19.6	17.8	15.4	14.5	81	0.5	***	***
14	***	21.7	20.4	19.1	18.1	86	0	***	***
15	***	23	21.8	20.6	20.3	91	0	***	***
16	***	24.8	22.8	21.1	20.9	90	0	***	***
17	***	24.4	22.9	21.8	21	89	0	***	***
18	***	24.8	23.3	22	21.5	90	0	***	***
19	***	28.8	24.5	22.2	22.1	87	0	***	***
20	***	29.1	24.2	21.5	20.9	83	0	***	***
21	***	26.5	22.9	20.1	20.3	86	0	***	***
22	***	22.5	21.3	19.9	17.7	81	0	***	***
23	***	25.3	21.4	19.4	14.2	64	0	***	***
24	***	22.4	20	18.8	15.2	75	0	***	***
25	***	19.4	18.1	16.8	14.7	81	1	***	***
26	***	20.9	19	17.1	15.3	79	0	***	***
27	***	23.8	20.2	17.8	17.6	86	1.5	***	***
28	***	25.6	21.2	19.2	17.2	78	0	***	***
29	***	27.3	22.3	19.4	18.3	79	0	***	***
30	***	28.4	23.7	21.8	20.7	84	0	***	***
31	***	26.6	23.8	22.4	21.4	87	0	***	***

*** unavailable

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

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

EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

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

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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

EVENT AND ACTION PLAN FOR WATER QUALITY

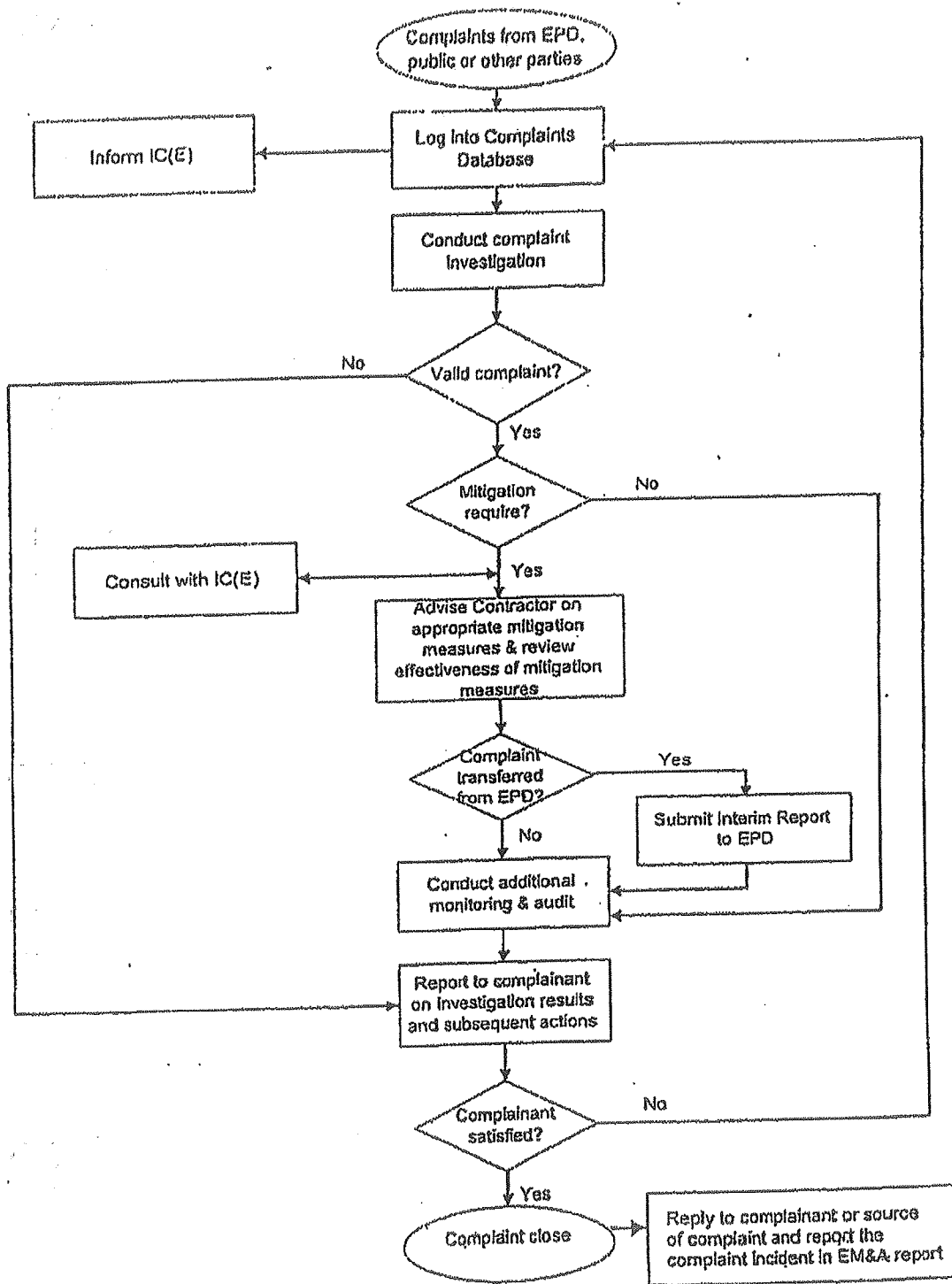
Event	ACTION				IEC
	ET Leader	Contractor	ER	IEC	
<p>Action level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Repeat in-situ measurement to confirm findings 3. Notify Contractor in writing within 24 hours of identification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

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

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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



Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 4
 Environmental Complaint Handling Procedure –
 Tuen Mun Area 38 Fill Bank

Appendix G

Construction Programme

Master Programme of Contract No. CV/2013/06 - Handling of Surplus Public Fill

Site Location : Tuen Mun Area 38 Fill Bank

ID	Activity	Original Duration	Start	Finish
A1240	Take Over	0	23-Jan-14	
A1220	Operation	1100	23-Jan-14	26-Jan-17
A1250	Hand Over to CEDD	0		26-Jan-17
Stage B1 Surveillance System		120	28-Nov-13	27-May-14
A1190	Submission	30	28-Nov-13	27-Dec-13
A1200	Approval by Engineer	7	28-Dec-13	03-Jan-14
A1210	Installation	64	23-Jan-14	27-May-14
A1230	Hand Over to Engineer	0		27-May-14



Appendix H

Weekly ET's Site Inspection Record



CEDD Contract No.: CV/2013/06

Handing of Surplus Public Fill (2014-2016) - Tuen Mun Area 38 Fill Bank

Inspection Date : 5/3/15

Time : 10:00

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

Wind : Calm / Light / Breeze / Strong

Temperature : 19°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	LEE KI LING	Kwan Wan	Shak Hei Wan
Title	Nov/P3	EO	ET

	Environmental Checklist	Implementation Stages*			Remark
		Yes	No	N/A	
Fugitive Dust Emission					
"	Dust control / mitigation measures shall be provided to prevent dust nuisance.	√			
"	Water sprays shall be provided and used to dampen materials.	√			
"	All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	√			
"	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.	√			
"	Unpaved areas should be watered regularly to avoid dust generation.	√			
"	The designated site main haul road shall be paved or regular watering.	√			
"	The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	√			
"	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.	√			
"	The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
"	Vehicle and equipment should be switched off while not in use.	√			
"	All plant and equipment should be well maintained e.g. without black smoke emission.	√			
"	Open burning should be prohibited.	√			
Noise Impact					
"	The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	√			
"	The constructions works should be scheduled to minimize noise nuisance.	√			
"	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.	√			
"	Compressors and generators should operate with door closed.	√			
"	Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	√			
"	Noisy equipment and mobile plant shall always be site away from NSRs.	√			

Environmental Checklist	Implementation Stages*		Remark
	Yes	No	
	N/A		
Water Quality			
" Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√		
" The storm water intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√		
" Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√		
" The material shall be properly covered to prevent washed away especially before rainstorm.	√		
" The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√		
" 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.	√		
" 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.	√		
" 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.	√		
" Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√		
" 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.	√		
" A waste collection vessel shall be deployed to remove floating debris.	√		
Landscape and Visual			
" The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	√		
" Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	√		
" Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	√		
" Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	√		
" Lighting shall be set to minimise night-time glare.	√		

		Implementation Stages*			Remark
		Yes	No	N/A	
Environmental Checklist					
Waste Management					
Construction Waste Management					
•	Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	✓			
•	Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	✓			
•	Mud and debris should be removed from waterworks access roads and associated drainage systems.	✓			
•	Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	✓			
•	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	✓			
•	Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	✓			
•	In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	✓			
•	Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	✓			
Chemical Waste Management					
•	It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	✓			
•	After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	✓			
•	Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	✓			
•	Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	✓			
•	Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	✓			
•	The designated chemical waste storage area should only be used for storing chemical wastes.	✓			
•	The set-up of chemical waste storage area should				
•	Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	✓			
•	Be enclosed on at least 3 sides and securely closed.	✓			
•	Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	✓			
•	Have adequate ventilation.	✓			
•	Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	✓			
•	Be arranged so that incompatible materials are adequately separated.	✓			


	Implementation Stages*			Remark
	Yes	No	N/A	
▪ Warning panels should be displayed at the waste storage area.	√			
▪ Waste storage area should be cleaned and maintained regularly.	√			
▪ Chemical waste should be transported regularly by a registered chemical waste collector to a facility licensed to receive chemical waste.	√			
▪ All generators, fuel and oil storage should be within bundle areas.	√			
▪ Oil leakage from machinery, vehicle and plant should be prevented.	√			
▪ In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√			
▪ The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√			
Good Site Practices				
▪ Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√			
▪ Training of site personnel in proper waste management and chemical handling procedures should be provided.	√			
• 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.	√			
• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√			
• The Environmental Permit should be displaced conspicuously on site.	√			
• Construction noise permits should be posted at site entrance or available for site inspection.	√			
▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
▪ Chemical storage area provided with lock and located on sealed areas.	√			
▪ All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	√			
▪ Any unused chemicals or those with remaining functional capacity should be recycled.	√			
▪ Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√			
▪ 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.	√			
▪ A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√			
▪ A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	√			

Summary of the Weekly Site Inspection:

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

Remark

No defective work or observation was recorded during the weekly site inspection.

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		05 March 2015



Inspection Date : 12/3/15
 Time : 10:00
 Weather : Sunny / Fine / Cloudy / Overcast / Drizzle / Rain / Storm / Hazy
 Wind : Calm / Light / Breeze / Strong
 Temperature : 16°C
 Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:	<i>ke</i>	<i>[Signature]</i>	<i>Mark</i>
Name:	K. P. CHAN	Eric Wong	Mark Sai Wai
Title	AIOW / P3	EO	E.T

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Fugitive Dust Emission				
" Dust control / mitigation measures shall be provided to prevent dust nuisance.	✓			
" Water sprays shall be provided and used to dampen materials.	✓			
" All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	✓			
" 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.	✓			
" Unpaved areas should be watered regularly to avoid dust generation.	✓			
" The designated site main haul road shall be paved or regular watering.	✓			
" The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	✓			
" 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.	✓			
" The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	✓			
" Vehicle and equipment should be switched off while not in use.	✓			
" All plant and equipment should be well maintained e.g. without black smoke emission.	✓			
" Open burning should be prohibited.	✓			
Noise Impact				
" The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓			
" The constructions works should be scheduled to minimize noise nuisance.	✓			
" 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.	✓			
" Compressors and generators should operate with door closed.	✓			
" Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓			
" Noisy equipment and mobile plant shall always be site away from NSRs.	✓			

Environmental Checklist	Implementation Stages*		Remark
	Yes	No / N/A	
Water Quality			
Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√		
The storm water intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√		
Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√		
The material shall be properly covered to prevent washed away especially before rainstorm.	√		
The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√		
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.	√		
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.	√		
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.	√		
Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√		
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.	√		
A waste collection vessel shall be deployed to remove floating debris.	√		
Landscape and Visual			
The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	√		
Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	√		
Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	√		
Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	√		
Lighting shall be set to minimise night-time glare.	√		

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Waste Management				
Construction Waste Management				
Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	✓			
Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	✓			
Mud and debris should be removed from waterworks access roads and associated drainage systems.	✓			
Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	✓			
Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	✓			
Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	✓			
In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	✓			
Any soil contaminated with chemicals/foils shall be removed from site and the void created shall be filled with suitable materials.	✓			
Chemical Waste Management				
It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	✓			
After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	✓			
Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	✓			
Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	✓			
Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	✓			
The designated chemical waste storage area should only be used for storing chemical wastes.	✓			
The set-up of chemical waste storage area should				
Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	✓			
Be enclosed on at least 3 sides and securely closed.	✓			
Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	✓			
Have adequate ventilation.	✓			
Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	✓			
Be arranged so that incompatible materials are adequately separated.	✓			


Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Warning panels should be displayed at the waste storage area.	√			
Waste storage area should be cleaned and maintained regularly.	√			
Chemical waste should be transported regularly by a registered chemical waste collector to a facility licensed to receive chemical waste.	√			
All generators, fuel and oil storage should be within bundle areas.	√			
Oil leakage from machinery, vehicle and plant should be prevented.	√			
In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√			
The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√			
Good Site Practices				
Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√			
Training of site personnel in proper waste management and chemical handling procedures should be provided.	√			
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.	√			
Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√			
The Environmental Permit should be displaced conspicuously on site.	√			
Construction noise permits should be posted at site entrance or available for site inspection.	√			
Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
Chemical storage area provided with lock and located on sealed areas.	√			
All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	√			
Any unused chemicals or those with remaining functional capacity should be recycled.	√			
Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√			
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.	√			
A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√			
A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	√			

Summary of the Weekly Site Inspection:

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

Remark

No defective work or observation was recorded during the weekly site inspection.

Name	Title	Signature	Date
Linda Law	Senior Environmental Officer		12 March 2015



CEDD Contract No.: CV/2013/06

Handling of Surplus Public Fill (2014-2016) - Tuen Mun Area 38 Fill Bank

Inspection Date : 19/3/15

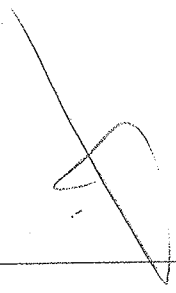

Time : 10:15

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

Wind : Calm / Light / Breeze / Strong

Temperature : 24°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:	R ₀		
Name:	K. P. CHAN	Eric Wan	Mak Yee Wai
Title	Allow / P3	Sub-Contractor	E.T

Environmental Checklist		Implementation Stages*			Remark
		Yes	No	N/A	
Fugitive Dust Emission					
▪	Dust control / mitigation measures shall be provided to prevent dust nuisance.	√			
▪	Water sprays shall be provided and used to dampen materials.	√			
▪	All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	√			
▪	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.	√			
▪	Unpaved areas should be watered regularly to avoid dust generation.	√			
▪	The designated site main haul road shall be paved or regular watering.	√			
▪	The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	√			
▪	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.	√			
▪	The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
▪	Vehicle and equipment should be switched off while not in use.	√			
▪	All plant and equipment should be well maintained e.g. without black smoke emission.	√			
▪	Open burning should be prohibited.	√			
Noise Impact					
▪	The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	√			
▪	The constructions works should be scheduled to minimize noise nuisance.	√			
▪	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.	√			
▪	Compressors and generators should operate with door closed.	√			
▪	Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	√			
▪	Noisy equipment and mobile plant shall always be site away from NSRs.	√			

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Water Quality				
▪ Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
▪ The storm water intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√			
▪ The material shall be properly covered to prevent washed away especially before rainstorm.	√			
▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
▪ 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.	√			
▪ 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 seats to their bottom openings to prevent leakage of material during transport.	√			
▪ 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.	√			
▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
▪ 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.	√			
▪ A waste collection vessel shall be deployed to remove floating debris.	√			
Landscape and Visual				
▪ The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	√			
▪ Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	√			
▪ Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	√			
▪ Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	√			
▪ Lighting shall be set to minimise night-time glare.	√			

Environmental Checklist		Implementation Stages*		Remark
		Yes	No	
Waste Management				
Construction Waste Management				
	Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	√		
	Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	√		
	Mud and debris should be removed from waterworks access roads and associated drainage systems.	√		
	Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	√		
	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	√		
	Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	√		
	In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	√		
	Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	√		
Chemical Waste Management				
	It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√		
	After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	√		
	Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	√		
	Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	√		
	Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	√		
	The designated chemical waste storage area should only be used for storing chemical wastes.	√		
	The set-up of chemical waste storage area should			
	▪ Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	√		
	▪ Be enclosed on at least 3 sides and securely closed.	√		
	▪ Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	√		
	▪ Have adequate ventilation.	√		
	▪ Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	√		
	▪ Be arranged so that incompatible materials are adequately separated.	√		


	Implementation Stages*			Remark
	Yes	No	N/A	
Environmental Checklist				
▪ Warning panels should be displayed at the waste storage area.	√			
▪ Waste storage area should be cleaned and maintained regularly.	√			
▪ Chemical waste should be transported regularly by a registered chemical waste collector to a facility licensed to receive chemical waste.	√			
▪ All generators, fuel and oil storage should be within bundle areas.	√			
▪ Oil leakage from machinery, vehicle and plant should be prevented.	√			
▪ In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√			
▪ The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√			
Good Site Practices				
▪ Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√			
▪ Training of site personnel in proper waste management and chemical handling procedures should be provided.	√			
▪ 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.	√			
▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√			
▪ The Environmental Permit should be displaced conspicuously on site.	√			
▪ Construction noise permits should be posted at site entrance or available for site inspection.	√			
▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
▪ Chemical storage area provided with lock and located on sealed areas.	√			
▪ All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	√			
▪ Any unused chemicals or those with remaining functional capacity should be recycled.	√			
▪ Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√			
▪ 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.	√			
▪ A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√			
▪ A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be bunded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	√			

Summary of the Weekly Site Inspection:

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

Remark

No defective work or observation was recorded during the weekly site inspection.

Name	Title	Signature	Date
Checked by Linda Law	Senior Environmental Officer		19 March 2015



CEDD Contract No.: CV/2013/06

Handling of Surplus Public Fill(2014-2016) - Tuen Mun Area 38 Fill Bank

Inspection Date : 24.3.15


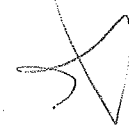

Time : 08:00

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

Wind : Calm / Light / Breeze / Strong

Temperature : 17°C

Humidity : High / Moderate / Low

Inspected by	CEDD	Contractor / Sub-Contractor	ET
Signature:			
Name:	LEE KI KING	Eric Wan	By Cytyty
Title	LOW/P3	EO	E.7

Environmental Checklist		Implementation Stages*		Remark
		Yes	No / N/A	
Fugitive Dust Emission				
▪	Dust control / mitigation measures shall be provided to prevent dust nuisance.	✓		
▪	Water sprays shall be provided and used to dampen materials.	✓		
▪	All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	✓		
▪	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.	✓		
▪	Unpaved areas should be watered regularly to avoid dust generation.	✓		
▪	The designated site main haul road shall be paved or regular watering.	✓		
▪	The haul road inside the site and public road around the site entrance should be kept clean and free from dust.	✓		
▪	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.	✓		
▪	The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	✓		
▪	Vehicle and equipment should be switched off while not in use.	✓		
▪	All plant and equipment should be well maintained e.g. without black smoke emission.	✓		
▪	Open burning should be prohibited.	✓		
Noise Impact				
▪	The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	✓		
▪	The constructions works should be scheduled to minimize noise nuisance.	✓		
▪	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.	✓		
▪	Compressors and generators should operate with door closed.	✓		
▪	Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	✓		
▪	Noisy equipment and mobile plant shall always be site away from NSRs.	✓		

Environmental Checklist		Implementation Stages*			Remark
		Yes	No	N/A	
Water Quality					
"	Drainage system and the sand / silt removal facilities should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	√			
"	The storm water intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	√			
"	Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	√			
"	The material shall be properly covered to prevent washed away especially before rainstorm.	√			
"	The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	√			
"	Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD.	√			
"	Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	√			
"	A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains.	√			
"	The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	√			
"	Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided.	√			
"	The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities.	√			
"	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.	√			
"	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.	√			
"	Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	√			
"	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.	√			
"	A waste collection vessel shall be deployed to remove floating debris.	√			
Landscape and Visual					
"	The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD.	√			
"	Surface of outer slopes of the Fill Bank shall preferably be hydroseeded.	√			
"	Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable.	√			
"	Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level.	√			
"	Lighting shall be set to minimise night-time glare.	√			

Environmental Checklist	Implementation Stages*			Remark
	Yes	No	N/A	
Waste Management				
Construction Waste Management				
" Relevant licence / permits for disposal of construction waste or excavated materials available for inspection.	√			
" Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal.	√			
" Mud and debris should be removed from waterworks access roads and associated drainage systems.	√			
" Provision of sufficient waste disposal points and regular collection for disposal. Appropriate measures should be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	√			
" Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	√			
" Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill.	√			
" In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements.	√			
" Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	√			
Chemical Waste Management				
" It is required to register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	√			
" After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.	√			
" Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation.	√			
" Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility.	√			
" Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area.	√			
" The designated chemical waste storage area should only be used for storing chemical wastes.	√			
" The set-up of chemical waste storage area should				
" Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition.	√			
" Be enclosed on at least 3 sides and securely closed.	√			
" Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest.	√			
" Have adequate ventilation.	√			
" Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary).	√			
" Be arranged so that incompatible materials are adequately separated.	√			



	Implementation Stages*			Remark
	Yes	No	N/A	
		√		
" Warning panels should be displayed at the waste storage area.	√			
" Waste storage area should be cleaned and maintained regularly.	√			
" Chemical waste should be transported regularly by a registered chemical waste collector to a facility licensed to receive chemical waste.	√			
" All generators, fuel and oil storage should be within bundle areas.	√			
" Oil leakage from machinery, vehicle and plant should be prevented.	√			
" In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	√			
" The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	√			
Good Site Practices				
" Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	√			
" Training of site personnel in proper waste management and chemical handling procedures should be provided.	√			
" 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.	√			
" Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	√			
" The Environmental Permit should be displaced conspicuously on site.	√			
" Construction noise permits should be posted at site entrance or available for site inspection.	√			
" Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	√			
" Chemical storage area provided with lock and located on sealed areas.	√			
" All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	√			
" Any unused chemicals or those with remaining functional capacity should be recycled.	√			
" Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	√			
" 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.	√			
" A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	√			
" A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	√			

Summary of the Weekly Site Inspection:

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

Remark

No defective work or observation was recorded during the weekly site inspection.

Name	Title	Signature	Date
Prepared by Frankie Tang	Assistant Supervisor		24 March 2015
Checked by Linda Law	Senior Environmental Officer		24 March 2015

Appendix I

Implementation Schedule of Mitigation Measures



Environmental Mitigation Implementation Schedule

Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Air Quality					
▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	All areas	✓			
▪ Water sprays shall be provided and used to dampen materials.	All areas	✓			
▪ All stockpile of aggregate or soil should be enclosed or covered and water applied in dry or windy condition.	All areas	✓			
▪ 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.	All areas	✓			
▪ Unpaved areas should be watered regularly to avoid dust generation.	Site Egress	✓			
▪ The designated site main haul road shall be paved or regular watering.	All haul roads	✓			
▪ The public road around the site entrance should be kept clean and free from dust.	All areas	✓			
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	Site Egress	✓			
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	Site Egress	✓			
▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	All areas	✓			
▪ Vehicle and equipment should be switched off while not in use.	All areas	✓			
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	All areas	✓			
▪ Open burning should be prohibited.	All areas	✓			
Noise Impact					
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	All areas	✓			
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	All areas	✓			
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	All areas	✓			
▪ Air compressors and hand held breakers should have noise labels.	All areas	✓			
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	All areas	✓			
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	All areas	✓			



	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
Water Quality				
<ul style="list-style-type: none"> ▪ The existing / realigned intercepting channels and the sand / silt removal facilities shall be used and maintained. ▪ 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. ▪ The storm water intercepting system shall be effective to collect of runoff and remove suspended solids before discharge. ▪ The material shall be properly covered to prevent washed away especially before rainstorm. ▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding. ▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water. ▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains. ▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. ▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. ▪ The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities. ▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water. ▪ Adequate environmental control measures shall be provided / avoid dropping of fill material into the sea during the transfer. ▪ A waste collection vessel shall be deployed to remove floating debris. 				
andscape and Visual				
<ul style="list-style-type: none"> • The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD. • Surface of outer slopes of the Fill Bank shall preferably be hydroseeded. • Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable. • <i>Casuarina equisetifolia</i> were planted as buffer tree along the northern perimeter of the Site. The height of <i>Casuarina equisetifolia</i> was maintained at least 3m above soil level. • Lighting shall be set to minimise night-time glare. 				
Waste Management				
Construction Waste Management				
<ul style="list-style-type: none"> • Relevant licence / permits for disposal of construction waste or excavated materials available for inspection. 				



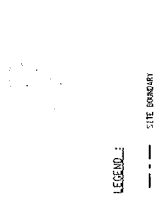
Environmental Protection Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
• Waste storage area should be cleaned and maintained regularly.	Waste Storage Area	✓			
• Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	All areas	✓			
• All generators, fuel and oil storage should be within bundle areas.	All areas	✓			
• Oil leakage from machinery, vehicle and plant should be prevented.	All areas	✓			
• In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	All areas	✓			
• The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	All areas	✓			
Good Site Practices					
• Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	All areas	✓			
• Training of site personnel in proper waste management and chemical handling procedures should be provided.	All areas	✓			
• 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.	All areas	✓			
• Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All areas	✓			
• The Environmental Permit should be displaced conspicuously on site.	Site Entrance	✓			
• Construction noise permits should be posted at site entrance or available for site inspection.	Site Entrance	✓			✓
• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	All areas	✓			
• Chemical storage area provided with lock and located on sealed areas.	Chemical Storage Area	✓			
• All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	Chemical Storage Area	✓			
• Any unused chemicals or those with remaining functional capacity should be recycled.	All areas	✓			
• Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	All areas	✓			
• 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.	All areas	✓			
• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	All areas	✓			
• A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	All areas	✓			
• Remove wastes in a timely manner.	All areas	✓			



Appendix J
Site General Layout plan

- NOTES:
1. ALL COORDINATES REFER TO 1980 ADIC JONG GEODETIC DATUM 1980 AND IN METERS.
 2. DIMENSIONS BEHIND OR WITHOUT DIMENSION LINE ARE TO CENTERLINE UNLESS SPECIFIED OTHERWISE.
 3. ALL DIMENSIONS ARE IN METERS.

- LEGEND:**
- SITE BOUNDARY
 - EXISTING HOUSING
 - ⊗ EXISTING GATE
 - EXISTING HAZARDOUS AREA
 - ⊘ EXISTING REINFORCED CONCRETE PILING
 - ⊘ EXISTING REMAINING PILING
 - ⚠ PROPOSED CITY CENTER TOWER
 - ⚠ PROPOSED CITY CENTER ADJACENT ON THE EXISTING POST



SETTING-OUT DETAILS

POINT	EASTING	NORTHING
A	811677.421	825531.355
B	811678.529	825492.421
C	811678.529	825492.421
D	811678.529	825492.421
E	811678.529	825492.421
F	811678.529	825492.421
G	811678.529	825492.421
H	811678.529	825492.421
I	811678.529	825492.421
J	811678.529	825492.421
K	811678.529	825492.421
L	811678.529	825492.421
M	811678.529	825492.421
N	811678.529	825492.421
O	811678.529	825492.421
P	811678.529	825492.421
Q	811678.529	825492.421
R	811678.529	825492.421
S	811678.529	825492.421
T	811678.529	825492.421
U	811678.529	825492.421
V	811678.529	825492.421
W	811678.529	825492.421
X	811678.529	825492.421
Y	811678.529	825492.421
Z	811678.529	825492.421
AA	811678.529	825492.421
AB	811678.529	825492.421
AC	811678.529	825492.421
AD	811678.529	825492.421

REVISION

NO.	DATE	BY	REVISION
001	01/09/16	P. Y. LIU	STANDARD (2014-2016)
002	01/09/16	P. K. YU	STANDARD (2014-2016)
003	01/09/16	J. CHANG	STANDARD (2014-2016)

APPROVED

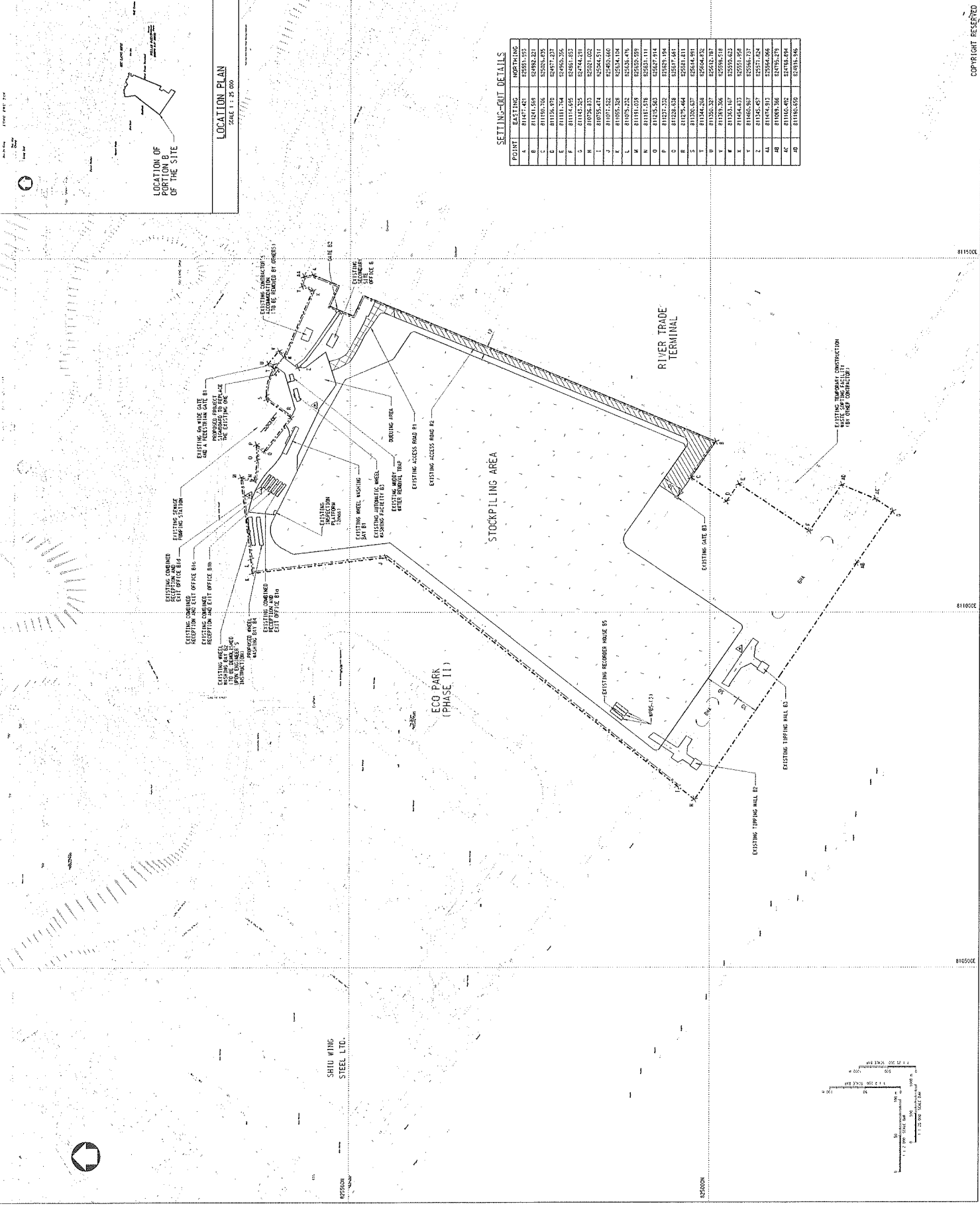
DESIGNED BY	DR. J. CHANG
CHECKED BY	DR. J. CHANG
DATE	01/09/16
PROJECT NO.	CV2013/05
DRAWING NO.	
CONTRACT	

HANDLING OF SURPLUS PUBLIC FILL (2014-2016)

DRAWING TITLE
TUEN MUN AREA 38 FILL BANK FILL BANK - GENERAL LAYOUT

DRAWING NO. FM10068-16
SCALE 1:2000
AS SHOWN

OFFICE: FILL MANAGEMENT DIVISION CIVIL ENGINEERING OFFICE



SHUI WING STEEL LTD.

ECCO PARK (PHASE II)

STOCKPILING AREA

RIVER TRADE TERMINAL

EXISTING TIPPER HALL B2

EXISTING TIPPER HALL B3

EXISTING TIPPER HALL B5

EXISTING RECYCLE HOUSE B5

EXISTING WAREHOUSE B5

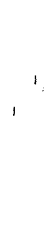
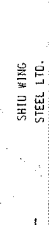
EXISTING WAREHOUSE B5

EXISTING WAREHOUSE B5

EXISTING WAREHOUSE B5

EXISTING WAREHOUSE B5

EXISTING WAREHOUSE B5





Appendix K

QA/QC Results of Laboratory Analysis



QA/QC Results of Laboratory Analysis of Total Suspended Solids

Sampling Date	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
03/03/15	106.6	FC1-S	7.1	FM2-M	100.0
	101.1	FM2-B	4.7	EM1-S	103.2
	104.4	EM1-M	7.7	EC2-B	101.1
05/03/15	107.8	FC1-S	2.6	FM2-M	102.2
	93.3	FM2-B	6.6	EM1-S	101.6
	93.2	EM1-M	7.9	EC2-B	92.1
07/03/15	104.5	FC1-S	3.6	FM2-M	95.0
	104.3	FM2-B	1.4	EM1-S	104.4
	101.6	EM1-M	1.9	EC2-B	102.5
10/03/15	107.4	FC1-S	6.2	FM2-M	98.5
	101.4	FM2-B	1.1	EM1-S	98.7
	105.1	EM1-M	7.9	EC2-B	96.1
12/03/15	94.3	FC1-S	3.9	FM2-M	108.1
	95.0	FM2-B	1.8	EM1-S	92.3
	101.0	EM1-M	7.5	EC2-B	96.9
14/03/15	107.2	FC1-S	2.4	FM2-M	107.0
	107.0	FM2-B	5.2	EM1-S	108.4
	101.4	EM1-M	6.0	EC2-B	94.3
17/03/15	99.2	FC1-S	3.4	FM2-M	116.3
	98.7	FM2-B	4.9	EM1-S	112.2
	110.5	EM1-M	3.3	EC2-B	110.1
19/03/15	105.0	FC1-S	6.4	FM2-M	108.7
	106.1	FM2-B	2.1	EM1-S	102.6
	94.7	EM1-M	0.4	EC2-B	97.4
21/03/15	99.6	FC1-S	7.0	FM2-M	98.5
	105.3	FM2-B	4.9	EM1-S	98.3
	95.7	EM1-M	3.8	EC2-B	94.9
24/03/15	100.6	FC1-S	5.9	FM2-M	104.8
	95.3	FM2-B	7.3	EM1-S	104.4
	107.9	EM1-M	5.9	EC2-B	101.0
26/03/15	96.2	FC1-S	4.5	FM2-M	96.7
	92.5	FM2-B	0.7	EM1-S	104.4
	103.2	EM1-M	0.0	EC2-B	105.0
28/03/15	102.5	FC1-S	1.2	FM2-M	104.8
	97.4	FM2-B	6.6	EM1-S	104.9
	108.0	EM1-M	8.2	EC2-B	108.9
31/03/15	104.3	FC1-S	2.3	FM2-M	102.4
	97.6	FM2-B	2.8	EM1-S	99.0
	94.3	EM1-M	6.0	EC2-B	95.2

Note: (*)% Recovery of QC sample should be between 80% to 120%.

(#)% Error of Sample Duplicate should be between -10% to 10%.

(@)% Recovery of Sample Spike should be between 80% to 120%.



Appendix L

Complaint Log

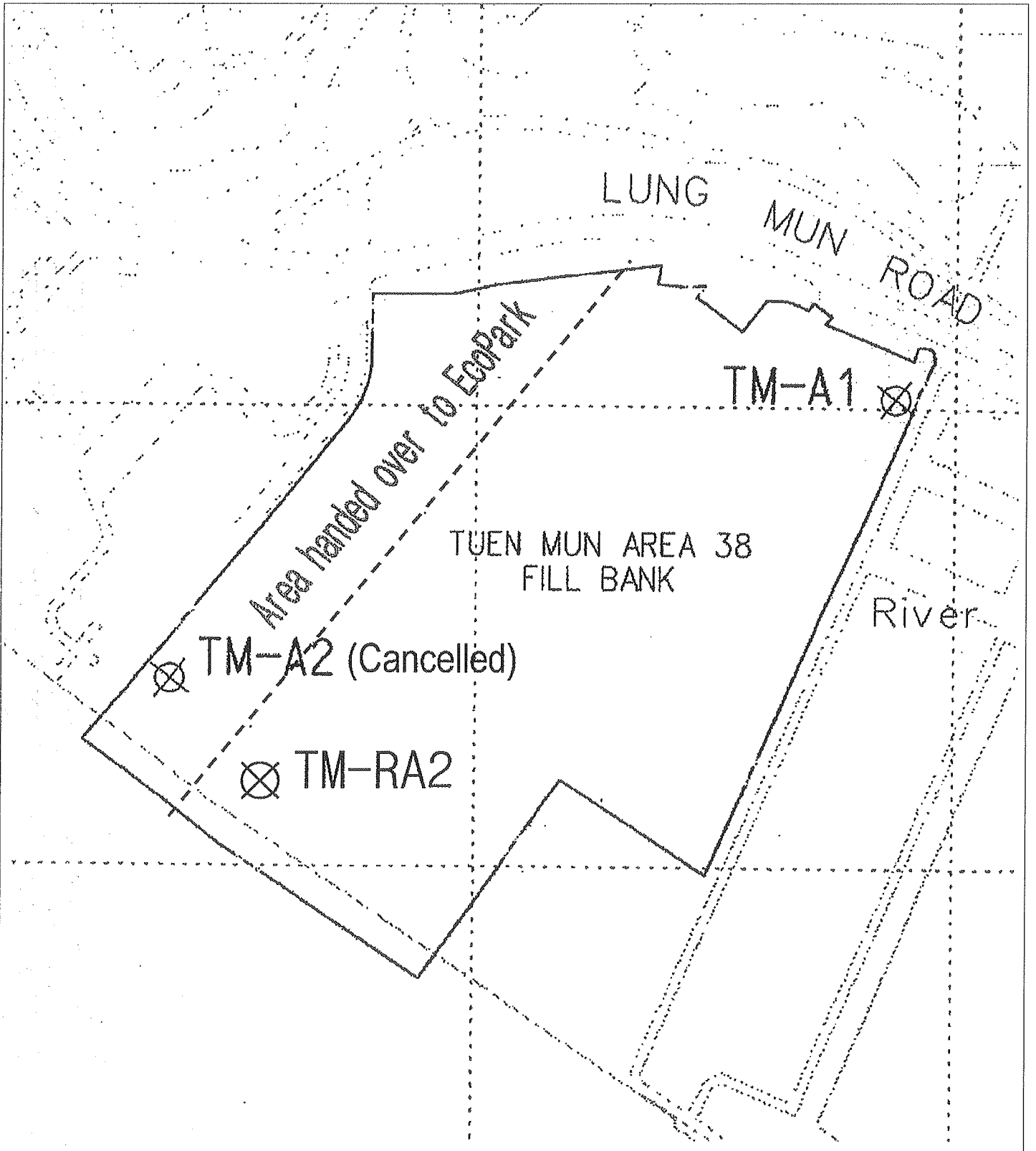


Complaint Log

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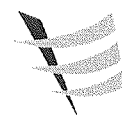


Figures

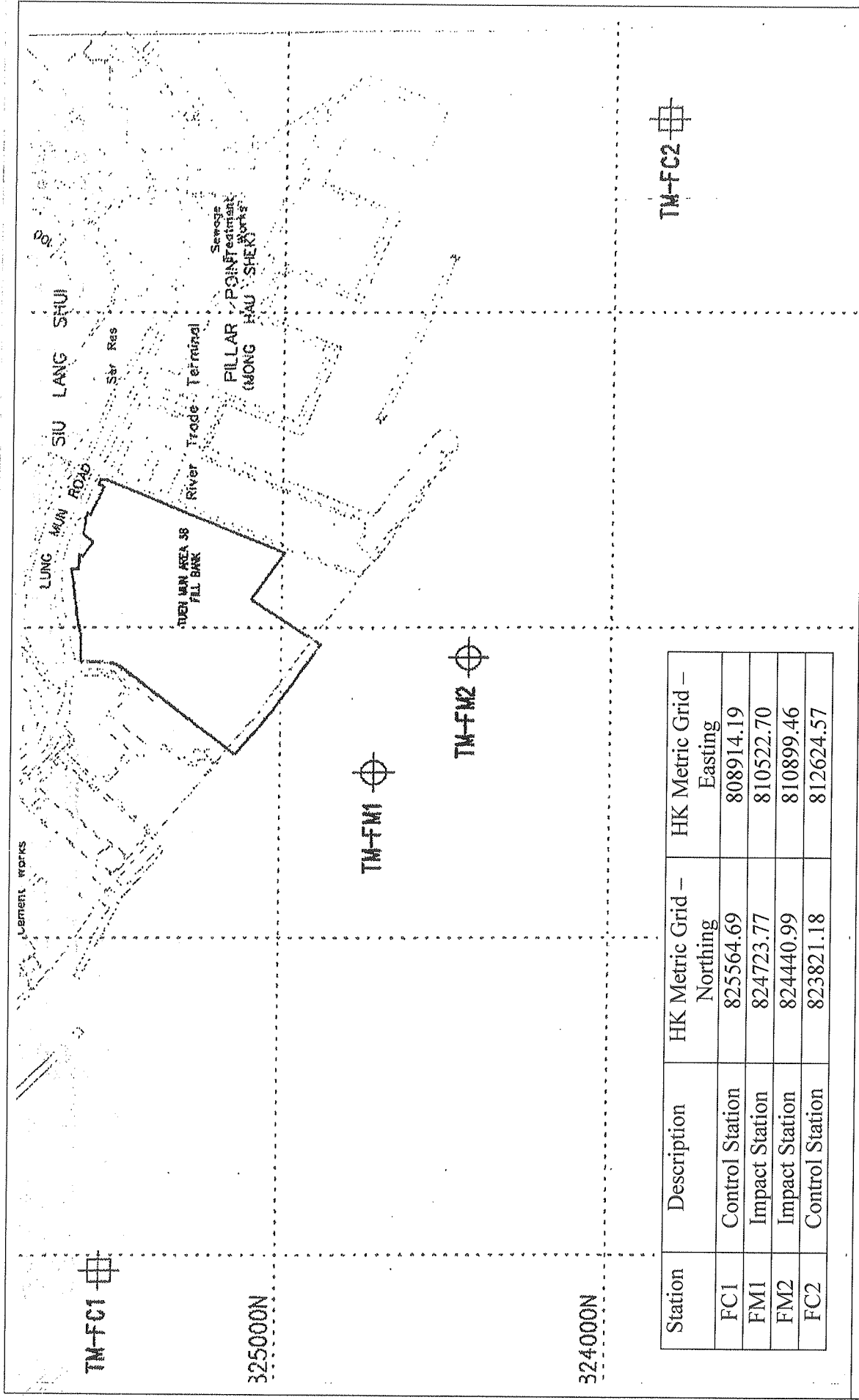


Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 1
 Locations of Air Quality Monitoring Stations –
 Tuen Mun Area 38 Fill Bank



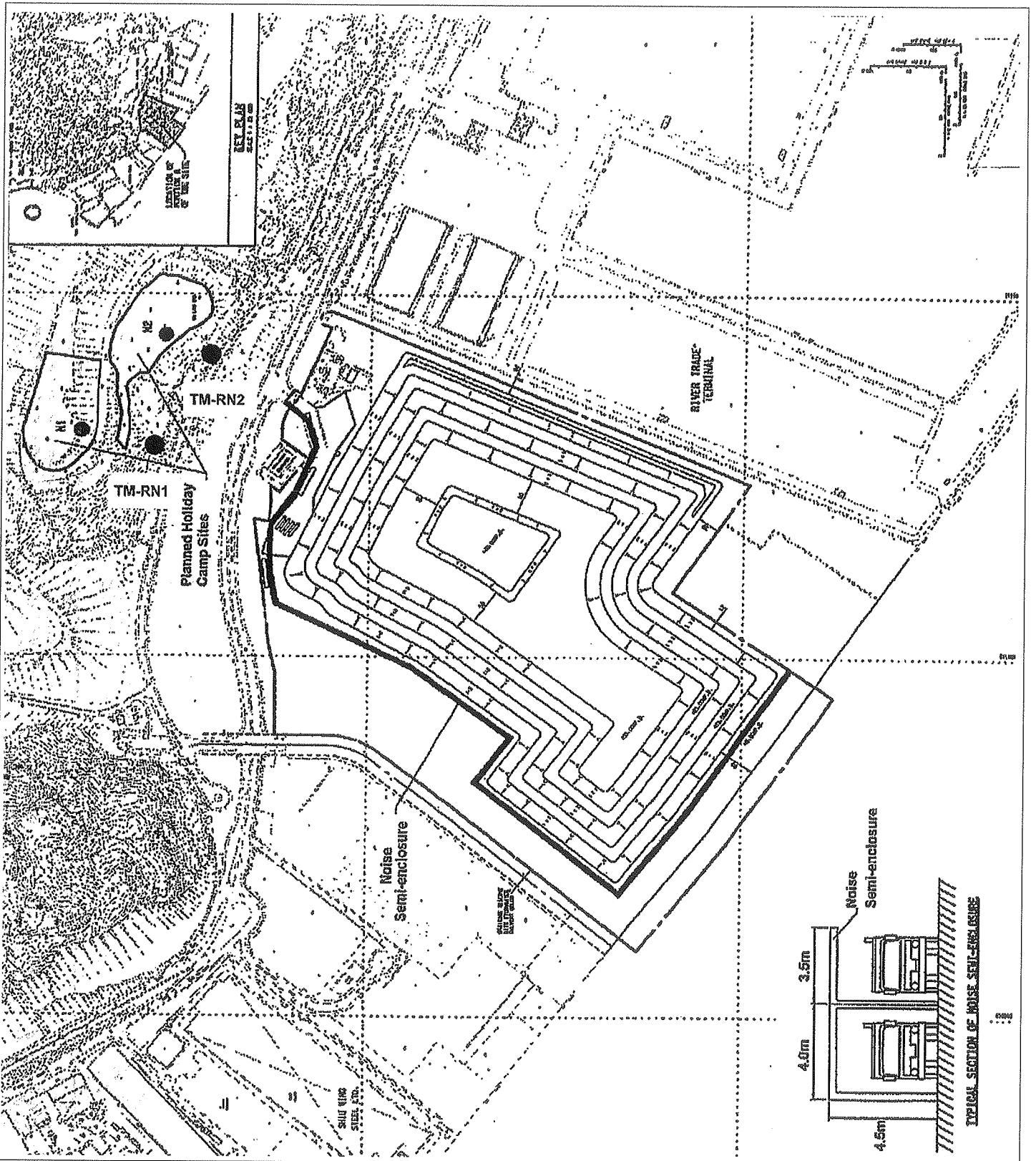
東業德勤測試顧問有限公司
 ETS-TESTCONSULT LIMITED



Station	Description	HK Metric Grid – Northing	HK Metric Grid – Easting
FC1	Control Station	825564.69	808914.19
FM1	Impact Station	824723.77	810522.70
FM2	Impact Station	824440.99	810899.46
FC2	Control Station	823821.18	812624.57

Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 2
 Locations of Water Quality Monitoring Station –
 Tuen Mun Area 38 Fill Bank



Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 3
 Locations of Noise Quality Monitoring Stations –
 Tuen Mun Area 38 Fill Bank



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