東業德勤測試顧問有限公司
ETS-TESTCONSULT LTD.™

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

T: +852 2695 8318
F: +852 2695 3944
E: etl@ets-testconsult.com
W: www.ets-testconsult.com

# China Harbour – Zhen Hua Joint Venture

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

### TSEUNG KWAN O AREA 137 FILL BANK

### QUARTERLY EM&A SUMMARY REPORT NO.11

### (FROM NOVEMBER 2019 TO JANUARY 2020)

Prepared by: _____
TANG, Chung Hang
Environmental Officer

2468133

Checked by: _____
LAU, Chi Leung
Environmental Team Leader

Issue Date: 20 February 2020 Report No: ENA01036

RAMBOLL

Ref.: CEDPFRSFEM02_0_0849L.20

2 March 2020

By Email and Fax No.: 2695 3944

ETS-Testconsult Limited
8/F, Block B, Veristrong Industrial Centre
34-36 Au Pui Wan Street
Fo Tan, Hong Kong

Attention: Mr. C.L. Lau

Dear Mr. Lau,

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

**Quarterly EM&A Summary Report No. 11 (November 2019 to January 2020) for the Tseung Kwan O Area 137 Fill Bank**

Reference is made to your submission of the draft Quarterly EM&A Summary Report No. 11 (November 2019 to January 2020) for the TKO Area 137 Fill Bank received by email on 24 February 2020 and the subsequent revision on 2 March 2020.

We are pleased to inform you that we have no further comment on the quarterly EM&A summary report.

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

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

F. C. Tsang
Independent Environmental Checker

c.c. CEDD Attn: Mr. T M Yeung Fax No.: 2714 0113
CHZHJV Attn: Mr. S W Sung By Email

Q:\Projects\CEDPFRSFEM02\02 Project Management\02 Corr\CEDPFRSFEM02_0_0849L.20.doc

Ramboll Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
**www.ramboll.com**

**TABLE OF CONTENTS** **Page**

**Tables**

## ***EXECUTIVE SUMMARY***

This is Quarterly Environmental Monitoring and Audit (EM&A) Summary Report No.11 prepared by ETS-Testconsult Ltd (ET) for the "Contract No: CV/2015/07 –Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank" (The Project).

This report documents the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 from November 2019 to January 2020.

***Site Activities***

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

*November 2019*

*1.Operation of the TKO137 Fill Bank.*
*2.Delivery of public fill to Taishan;*
*3.Operation of dewatering plant and expanded dewatering plant*
*4.Operation of bentonite pool.*
*5.Concrete block breaking work.*
*6.Crushing plant operation.*
*7.Re-construction of sampling platforms at TKOFB;*
*8.Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay at TKOFB;*
*9.Repair works for damaged at TKOFB caused by Super Typhoon*
*10.Carrying out preliminary sorting of Public Fill for 3RS project;*
*11.Demolition and Construction of Recorder House A2 at TKOFB*
*12.Construction of MIC site office, Green Wall and carpark at TKOFB.*

*December 2019*

*1.Operation of the TKO137 Fill Bank.*
*2.Delivery of public fill to Taishan;*
*3.Operation of dewatering plant and expanded dewatering plant*
*4.Operation of bentonite pool.*
*5.Concrete block breaking work.*
*6.Crushing plant operation.*
*7.Re-construction of sampling platforms at TKOFB;*
*8.Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay at TKOFB;*
*9.Repair works for damaged at TKOFB caused by Super Typhoon*
*10.Carrying out preliminary sorting of Public Fill for 3RS project;*
*11.Demolition and Construction of Recorder House A2 at TKOFB*
*12.Construction of MIC site office, Green Wall and carpark at TKOFB.*

*January 2020*

*1.Operation of the TKO137 Fill Bank.*
*2.Delivery of public fill to Taishan;*
*3.Operation of dewatering plant and expanded dewatering plant*
*4.Operation of bentonite pool.*
*5.Concrete block breaking work.*
*6.Crushing plant operation.*
*7.Re-construction of sampling platforms at TKOFB;*
*8.Replacement of Y40 rebar with Y50 rebar at the existing wheel washing bay at TKOFB;*
*9.Repair works for damaged at TKOFB caused by Super Typhoon*
*10.Carrying out preliminary sorting of Public Fill for 3RS project;*
*11.Demolition and Construction of Recorder House A2 at TKOFB*
*12.Construction of MIC site office, Green Wall and carpark at TKOFB.*

Dump truck traffic and hauling activities at Barge Handling Area (BHA) were the major dust sources. Barge delivery of fill material was also undertaken in the reporting quarter. Besides the Fill Bank operation, the other dust sources near TKO Area 137 also included operation of C&DMSF and dumping activities at the SENT Landfill.

The desilting facilities were in proper operation to avoid silt discharge and the silt curtains were properly installed. There was no sediment plume observed during the monitoring events.

The major noise sources during the reporting quarter were the dump truck traffic and construction activities near the site egress. Noise impact on the sensitive receivers was insignificant in the reporting quarter according to the results of noise monitoring and site inspections.

***Environmental Monitoring Works***

***Noise Monitoring***

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

***Air Monitoring***

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in this quarter.

***Marine Water Quality Monitoring***

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

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

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

## 1.0 INTRODUCTION

China Harbour – Zhen Hua Joint Venture (CHZH-JV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the "Contract No: CV/2015/07 –Handling of Surplus Public Fill (2016-2018) – Tseung Kwan O (TKO) Area 137 Fill Bank" (The Project).

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

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

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

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

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

This quarterly report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 from November 2019 to January 2020.

## 2.0 PROJECT INFORMATION

### 2.1 Scope of the Project

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

- *Site clearance;*
- *Construction of a temporary storm water system;*
- *Stockpiling of 6 million $m^3$ of public fill;*
- *Setting up two barging points: one at the Tseung Kwan O Basin (TKO Basin) and one at the Construction and Demolition Material Sorting Facility (C&DMSF) for transporting the stockpiled public fill by barges;*
- *Construction and operation of a Construction and Demolition Material Sorting Facility (C&DMSF);*
- *Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin; and*
- *Remove the temporary fill bank.*

### 2.2 Site Description

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

### 2.3 Work Programme

Details of work programme in this quarter are shown in Appendix G.

### 2.4 Project Organization and Management Structure

The project organization chart is shown in Appendix A.

### 2.5 Contact Details of Key Personnel

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

Table 2.1 Contact Details of Key Personnel

| *Organization* | *Name of Key Staff* | *Project Role* | *Tel. No.* | *Fax No.* |
|---|---|---|---|---|
| *CEDD* | *T M Yeung, Norelle Li May Lau, James Sze, Phoebe Tang* | *Engineer's Representative* | *2762 5555* | *2714 0113* |
| *IEC (Ramboll)* | *F C Tsang* | *IEC* | *3465 2888* | *3465 2899* |
| *Contractor (CHZH-JV))* | *Michael Cheung* | *Project Director* | *2887 8118* | *2512 0427* |
| *ET (ETL)* | *C. L. Lau* | *ET Leader* | *2946 7791* | *2695 3944* |

## 3.0 SUMMARY OF EM&A REQUIREMENTS

### 3.1 EM&A Programme

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

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

The advice on implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 5 of the Report.

### 3.2 Monitoring Stations and Parameters

The EM&A Manual designates several locations to monitor environmental impacts in terms of air quality, noise and water quality due to the Project. The description and detailed locations of monitoring stations for air quality, noise and marine water quality are shown in Figures 1, 2 and 3 and relevant sections of this Report.

### 3.3 Monitoring Methodology and Calibration Details

All monitoring works were conducted and monitoring equipment was calibrated in according with the EM&A Manual.

### 3.4 Environmental Quality Performance Limits (Action/Limit Levels)

The environmental quality performance limits, i.e. Action/Limit Levels (AL Levels) were derived from the baseline monitoring results. If the measured environmental quality parameters exceed the AL Levels, the respective action plan will be implemented. The AL Levels for each monitoring parameter are given in Appendix E. The event action plan is given in Appendix F.

### 3.5 Environmental Mitigation Measures

Relevant mitigation measures were recommended in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in Appendix H.

## 4.0 MONITORING RESULTS

### 4.1 Air Quality

In accordance with the EM&A Manual, 1-hr and 24-hr TSP air quality monitoring were conducted three times and once per six days correspondingly.

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in this quarter. The trend of air quality during the reporting quarter is present in Appendix B. Wind data included wind speed and wind direction were extracted from Tseung Kwan O Station of Hong Kong Observatory and presented in Appendix K.

Major dust sources in the Fill Bank were dump truck traffic and hauling activities at BHA.

Table 4.1 presents the number of exceedances recorded in each month of the reporting quarter. The number of monitoring event included regular monitoring events and additional ones.

Table 4.1 Summary of Number of Exceedances for 1-hr and 24-hr TSP Monitoring

| *Monitoring Parameter* | *Level of Exceedance* | *November 2019* | *December 2019* | *January 2020* |
|---|---|---|---|---|
| *24-hr TSP* | *No of monitoring events* | *5* | *5* | *5* |
| | *Action Level* | *0* | *0* | *0* |
| | *Limit Level* | *0* | *0* | *0* |
| *1-hr TSP* | *No of monitoring events* | *15* | *15* | *17* |
| | *Action Level* | *0* | *0* | *0* |
| | *Limit Level* | *0* | *0* | *0* |

Table 4.2 presents the 1-hr and 24-hr TSP averages in the baseline period and for each month in the reporting quarter. It was found that the 1-hr TSP averages at both stations in the reporting quarter were higher than the baseline levels but they were within the AL Levels. Besides, the 24-hr TSP average results were below the baseline level and within the AL Levels. As a result, the Contractor should provide more mitigation measures refer to the EM&A Manual to avoid dust generation.

Table 4.2 Comparison of Baseline and Various Period of Averaged 1-hr and 24-hr TSP Impact monitoring Results

| *Period* | *1-hr TSP ($\mu g/m^3$)* | | *24-hr TSP ($\mu g/m^3$)* | |
|---|---|---|---|---|
| | *TKO-A1* | *TKO-A2a* | *TKO-A1* | *TKO-A2a* |
| *Baseline (29/08 – 13/09)* | *195* | | *123* | |
| *November 2019* | *205* | *240* | *95* | *100* |
| *December 2019* | *241* | *209* | *108* | *93* |
| *January 2020* | *208* | *176* | *110* | *96* |

## 4.2 Noise

Noise monitoring was required to be conducted at least once per month. Only daytime noise was monitored in the reporting quarter.

All recorded noise levels complied with the AL Levels. The registered noise levels in the past three months are plotted in Appendices C. Table 4.3 presents the limit level and average impact noise monitoring results during the reporting quarter.

Table 4.3 Summary of Impact Monitoring results of Noise Daytime Monitoring

| *Monitoring Location* | *Limit Level* | *November 2019* | *December 2019* | *January 2020* |
|---|---|---|---|---|
| | *Leq, dB(A)* | | | |
| *TKO-N1* | *75* | *60.4* | *67.1* | *64.2* |

The major noise sources in the reporting quarter were dump truck traffic and construction activities near the site egress. The noise impact was insignificant as the Fill Bank was remote from sensitive receivers.

## 4.3 Marine Water Quality

In accordance with the EM&A Manual, the marine water quality monitoring was conducted at the monitoring station (M4) and the control station (C1) in the reporting quarter.

Impact marine water quality monitoring was conducted three days per week. Measurements were taken at both mid-ebb and mid-flood tides at three depths (i.e. 1m below surface, mid depth and 1m above seabed). The AL Levels are included in Appendix E.

According to Environmental Permit (Permit no.:EP-134/2002/N) Condition 3.2, water quality survey/monitoring shall be conducted at control station C1a , monitoring stations M4a and M5 for the period from two weeks before commencement of operation of the additional 5 barging points to 4 weeks after cessation of their operation. The water quality survey/monitoring frequency and parameters at stations C1a, M4a and M5 shall be same as the requirements set out in the EM&A Manual and the monitoring results shall be incorporated in the monthly EM&A reports.

Due to "Hong Kong International Airport, Three Runway System Project Contract 3206 – Main Reclamation Works "(3RS project) operation of the additional barging point at TKO Area 137, the ET started monitoring events at the impact station M4a, M5 and the control station C1a from 14 May 2018 onwards.

Table 4.4 presents the total number of marine water quality exceedances in the reporting quarter. The trend of marine water quality in the past three months is depicted in Appendix D1.

Table 4.4 Total Number of Marine Water Quality Exceedances in the Quarter

| *Parameter* | *Exceedance Level* | *November 2019* | *December 2019* | *January 2020* |
|---|---|---|---|---|
| *Number of monitoring days* | | *13* | *12* | *13* |
| *Dissolved Oxygen, DO (S&M)* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Dissolved Oxygen, DO (B)* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Turbidity* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Suspended Solids, SS* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Total Number Exceedances* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |

Table 4.5 presents the total number of marine water quality exceedances (3RS project) in the reporting quarter. The trend of marine water quality in the past three months is depicted in Appendix D2.

Table 4.5 Total Number of Marine Water Quality Exceedances (3RS project) in the Quarter

| *Parameter* | *Exceedance Level* | *November 2019* | *December 2019* | *January 2020* |
|---|---|---|---|---|
| *Number of monitoring days* | | *13* | *12* | *13* |
| *Dissolved Oxygen, DO (S&M)* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Dissolved Oxygen, DO (B)* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Turbidity* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Suspended Solids, SS* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |
| *Total Number Exceedances* | *Action* | *0* | *0* | *0* |
| | *Limit* | *0* | *0* | *0* |

A comparison between the quarterly mean/median of SS and the 1.3 times of the baseline mean was made for each tide at each station. The statistical analysis results are given in Appendix I1 and it shows that a generally better marine quality was recorded in the reporting quarter in respect to 130% of the baseline mean. Monitoring stations with significant difference ($p<0.05$) is summarized in Table 4.6.

Table 4.6 Summary of Statistically Significant Results of SS

| *Monitoring Station* | *Significant difference?* | |
|---|---|---|
| | *Mid-ebb* | *Mid-flood* |
| *C1* | *X* | *X* |
| *M4* | *X* | *X* |

A comparison between the quarterly mean/median of SS and the 1.3 times of the baseline mean was made for each tide at each station. The statistical analysis results (3RS project) are given in Appendix I2 and it shows that a generally better marine quality was recorded in the reporting quarter in respect to 130% of the baseline mean. Monitoring stations with significant difference ($p<0.05$) is summarized in Table 4.7.

Table 4.7 Summary of Statistically Significant Results of SS (3RS project)

| *Monitoring Station* | *Significant difference?* | |
|---|---|---|
| | *Mid-ebb* | *Mid-flood* |
| *C1a* | *X* | *X* |
| *M4a* | *X* | *X* |
| *M5* | *X* | *X* |

## 5.0 INSPECTION RESULTS

### 5.1 Implementation Status of Environmental Mitigation Measures

ET conducted weekly site inspections to monitor the Contractor's implementation of environmental mitigation measures. After each site inspection, the Contractor was notified of ET's observations and recommendations. A corrective action plan detailing the environmental observations was prepared by ET and the Contractor then completed this plan to propose/report their remedial works.

Air quality was the major environmental issue in the reporting quarter. The Contractor generally implemented most of the environmental mitigation measures in the reporting quarter. Dump truck traffic was the major dust source in the Fill Bank. Generally, the Contractor implemented adequate dust mitigation measures in the reporting quarter including dampening of haul roads, water spraying

on the truckloads, operation of automatic wheel washing facilities and mist spraying systems, dampening of fill material prior to handling or stockpiling, etc.

Dump truck traffic and construction activities near the site egress were the major noise sources. As the Fill Bank was remote from the nearby NSRs, the noise impact was minimal. The powered mechanical equipment were generally operated and maintained properly.

Regarding the observations about the damaged silt curtain, the Contractor was reminded to maintain the silt curtain properly to serve the function of refuse containment boom to confine floating refuse. Furthermore, Dust emission was found upward trend, the Contractor was reminded to increase the watering to avoid dust emission.

Although there were a few observations regarding dust control, such as fugitive dust emission and accumulation of fill materials, the Contractor rectified most of these problems. Besides, the Contractor should increase the site watering in order to minimize the fugitive dust emissions.

The germination rate on the panel was satisfactory in this reporting quarter. The Contractor was reminded to maintain the panel properly.

## 5.2 Status of Environmental Licensing and Permitting

The status of licences and permits is summarized in Table 5.1.

Table 5.1 Summary of environmental licensing and permit status

| *Description* | *Permit No.* | *Valid Month* | | *Section* |
|---|---|---|---|---|
| | | *From* | *To* | |
| *Environmental Permit* | *EP-134/2002/N* | *20/08/19* | *---* | ▪ *Site clearance*<br>▪ *Construction of a temporary storm water system*<br>▪ *Stockpiling of 6 million m3 of public fill*<br>▪ *Setting up two barging points for transporting the stockpiled public fill by barges*<br>▪ *Setting up a temporary barging point at the existing Explosive Off-loading Barging Point for the month of May 2004 to December 2004 for transporting the stockpiled public fill by barge*<br>▪ *Construction of operation of a construction and Demolition Material Sorting Facility (C&DMSF)*<br>▪ *Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin*<br>▪ *Remove the temporary fill bank* |
| *Chemical Waste Producer* | *5919-839-C4181-01* | *19/04/17* | *---* | *Spent battery cell containing heavy metals and spent lubricating oil* |
| *Marine Dumping Permit* | *EP/MD/20-064* | *18/10/19* | *31/12/19* | *Approval for dumping 1,000,000 tons (approximately equal to 555,555 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* |
| *Effluent Discharge License* | *WT00029178-2017* | *27/09/17* | *30/09/22* | *Effluent, Surface Run-off, and all other wastewater discharges from screen and sedimentation tank* |

| | | | | |
|---|---|---|---|---|
| *Billing Account for Waste Disposal* | *7027643* | *22/05/17* | --- | --- |
| *Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust)* | *415682* | *12/04/17* | --- | --- |

### 5.3 Advice on Solids and Liquid Waste Management Status

The Contractor usually disposed of non-inert waste, including general refuse and materials segregated from the existing stockpiles, to SENT landfill. Table 5.2 summarizes data on offsite waste disposal in the quarter.

Table 5.2 Estimated Offsite Waste Disposal in the Reporting Quarter

| *Waste Type* | *November 2019* | *December 2019* | *January 2020* |
|---|---|---|---|
| *Public Fill ('000m$^3$)* | *0* | *0* | *0* |
| *C&D Waste (general refuse) ('000kg)* | *113.07* | *64.47* | *30.52* |
| *Chemical Waste (kg/L)* | *0* | *0* | *0* |

The site toilet and shower room and several chemical toilets were in use throughout the reporting quarter. Discharge from the site toilet and shower room was made to the additional drainage DP4 after passing through the sewage treatment system. A licensed collector also regularly collected waste from the chemical toilets.

## 6.0 NON-COMPLIANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

### 6.1 Summary of Non-compliance

In this reporting quarter, no exceedance of Action and limit levels on marine water quality was recorded.

No exceedances on 1-hour and 24-hour TSP monitoring results were recorded in this quarter.

Besides, no day-time noise level measured at the monitoring station exceeded the Action and Limit Level in this quarter.

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

Since there was no exceedance recorded in this quarter, the review of the reasons for the non-compliance was not required.

### 6.3 Summary of Actions Taken

Since there was no exceedance recorded in this quarter, no further action was not required to be taken.

### 6.4 Summary of Environmental Complaint, Notifications of Summons and Successful Prosecutions Handling

No complaint, notification of summon and successful prosecution was received in this quarter.

A summary of environmental complaints and prosecutions was given in Table 6.1.

Table 6.1 Summary of Environmental Complaints and Prosecutions

| *Period* | *Complaints logged* | *Summon served* | *Successful Prosecution* |
|---|---|---|---|
| *November 2019* | *0* | *0* | *0* |
| *December 2019* | *0* | *0* | *0* |
| *January 2020* | *0* | *0* | *0* |
| *Cumulative* | *11* | *0* | *0* |

## 7.0 COMMENTS, CONCLUSIONS AND RECOMMENDATION

In this quarter, major activity in the Fill Bank was the import and dumping of fill material. Air quality was the major environmental issue in the Fill Bank. Generally, the Contractor implemented most of the mitigation measures to minimize the dust impact.

No exceedance of Action and Limit levels was recorded for 1-hour and 24-hour TSP monitoring in this quarter.

No exceedance of Action and Limit Level of noise was recorded in this reporting quarter.

No exceedance of Action and limit level on marine water quality was recorded in this quarter

No complaint, notification of summon and successful prosecution was received in this quarter.

According to the ET weekly site inspection and IEC site audits carried out in this quarter, it was indicated that site practices of the Contractor were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was up to standard. 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.

According to the environmental site inspections performed in this quarter, 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 boswer;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the site activities;
- Designate proper haul roads to ensure effective water spraying; and
- Ensure all vehicles to be washed before leaving the site egress by provision, operation and maintenance of automatic wheel washing facilities.

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

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

***Chemical and Waste Management***
- Remove waste materials from the site to avoid accumulation regularly;
- Handle and store chemical wastes properly;
- Remove unwanted material in the existing stockpiles and avoid further dumping of such material;
- Provide and maintain sufficient drip trays for diesel drums, chemical containers, chemical waste storage drums and diesel operated generator set;
- Maintain mesh screen on top of the additional drainage, DP3 to avoid improper dumping of rubbish;
- Maintain good housekeeping at the workshop area;
- Ensure sufficient tarpaulin sheets are provided to cover drip trays; and
- Avoid soil being polluted during oil filling and equipment maintenance; hence, properly remove and store the contaminated soil, if any.

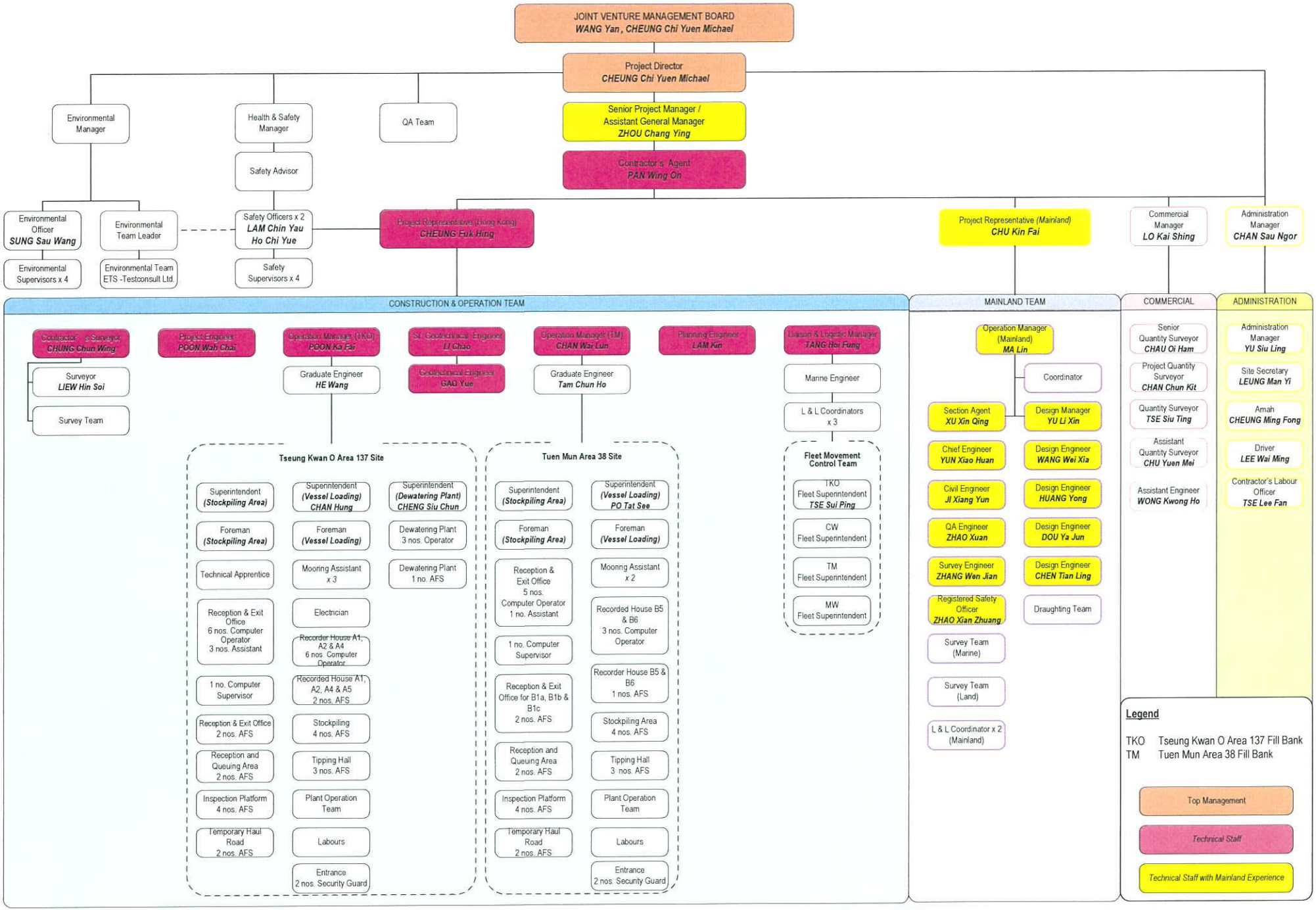
***Landscape and Visual***
- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding/chaining fences in accordance with agreed design at proper location;
- Maintain the hydroseeding slopes in accordance with the Landscape Plan.

- END OF REPORT -

# Appendix

# A

# Organization Chart

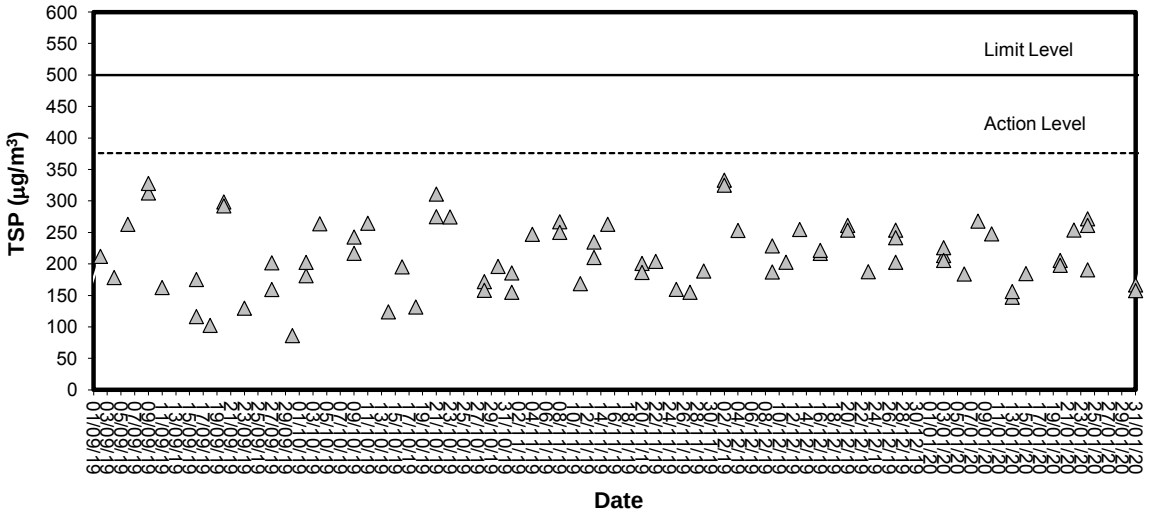

JOINT VENTURE MANAGEMENT BOARD
WANG Yan , CHEUNG Chi Yuen Michael
Project Director
CHEUNG Chi Yuen Michael
Senior Project Manager / Assistant General Manager
ZHOU Chang Ying
Contractor's Agent
PAN Wing On
Environmental Manager
Health & Safety Manager
QA Team
Safety Advisor
Environmental Officer
SUNG Sau Wang
Environmental Team Leader
Safety Officers x 2
LAM Chin Yau
Ho Chi Yue
Project Representative (Hong Kong)
CHEUNG Fuk Hing
Project Representative (Mainland)
CHU Kin Fai
Commercial Manager
LO Kai Shing
Administration Manager
CHAN Sau Ngor
Environmental Supervisors x 4
Environmental Team ETS -Testconsult Ltd.
Safety Supervisors x 4
CONSTRUCTION & OPERATION TEAM
MAINLAND TEAM
COMMERCIAL
ADMINISTRATION
Contractor's Surveyor
CHUNG Chun Wing
Project Engineer
POON Wah Chai
Operation Manager (TKO)
POON Ka Fai
Sr. Geotechnical Engineer
LI Chao
Operation Manager (TM)
CHAN War Lun
Planning Engineer
LAM Kin
Liaison & Logistic Manager
TANG Hoi Fung
Surveyor
LIEW Hin Soi
Survey Team
Graduate Engineer
HE Wang
Geotechnical Engineer
GAO Yue
Graduate Engineer
Tam Chun Ho
Marine Engineer
L & L Coordinators x 3
Tseung Kwan O Area 137 Site
Superintendent (Stockpiling Area)
Foreman (Stockpiling Area)
Technical Apprentice
Reception & Exit Office 6 nos. Computer Operator 3 nos. Assistant
1 no. Computer Supervisor
Reception & Exit Office 2 nos. AFS
Reception and Queuing Area 2 nos. AFS
Inspection Platform 4 nos. AFS
Temporary Haul Road 2 nos. AFS
Superintendent (Vessel Loading) CHAN Hung
Foreman (Vessel Loading)
Mooring Assistant x 3
Electrician
Recorder House A1, A2 & A4 6 nos. Computer Operator
Recorded House A1, A2, A4 & A5 2 nos. AFS
Stockpiling 4 nos. AFS
Tipping Hall 3 nos. AFS
Plant Operation Team
Labours
Entrance 2 nos. Security Guard
Superintendent (Dewatering Plant) CHENG Siu Chun
Dewatering Plant 3 nos. Operator
Dewatering Plant 1 no. AFS
Tuen Mun Area 38 Site
Superintendent (Stockpiling Area)
Foreman (Stockpiling Area)
Reception & Exit Office 5 nos. Computer Operator 1 no. Assistant
1 no. Computer Supervisor
Reception & Exit Office for B1a, B1b & B1c 2 nos. AFS
Reception and Queuing Area 2 nos. AFS
Inspection Platform 4 nos. AFS
Temporary Haul Road 2 nos. AFS
Superintendent (Vessel Loading) PO Tat See
Foreman (Vessel Loading)
Mooring Assistant x 2
Recorded House B5 & B6 3 nos. Computer Operator
Recorder House B5 & B6 1 nos. AFS
Stockpiling Area 4 nos. AFS
Tipping Hall 3 nos. AFS
Plant Operation Team
Labours
Entrance 2 nos. Security Guard
Fleet Movement Control Team
TKO Fleet Superintendent TSE Sui Ping
CW Fleet Superintendent
TM Fleet Superintendent
MW Fleet Superintendent
Operation Manager (Mainland) MA Lin
Coordinator
Section Agent XU Xin Qing
Design Manager YU Li Xin
Chief Engineer YUN Xiao Huan
Design Engineer WANG Wei Xia
Civil Engineer JI Xiang Yun
Design Engineer HUANG Yong
QA Engineer ZHAO Xuan
Design Engineer DOU Ya Jun
Survey Engineer ZHANG Wen Jian
Design Engineer CHEN Tian Ling
Registered Safety Officer ZHAO Xian Zhuang
Draughting Team
Survey Team (Marine)
Survey Team (Land)
L & L Coordinator x 2 (Mainland)
Senior Quantity Surveyor CHAU Oi Ham
Project Quantity Surveyor CHAN Chun Kit
Quantity Surveyor TSE Siu Ting
Assistant Quantity Surveyor CHU Yuen Mei
Assistant Engineer WONG Kwong Ho
Administration Manager YU Siu Ling
Site Secretary LEUNG Man Yi
Amah CHEUNG Ming Fong
Driver LEE Wai Ming
Contractor's Labour Officer TSE Lee Fan
Legend
TKO Tseung Kwan O Area 137 Fill Bank
TM Tuen Mun Area 38 Fill Bank
Top Management
Technical Staff
Technical Staff with Mainland Experience

# Appendix

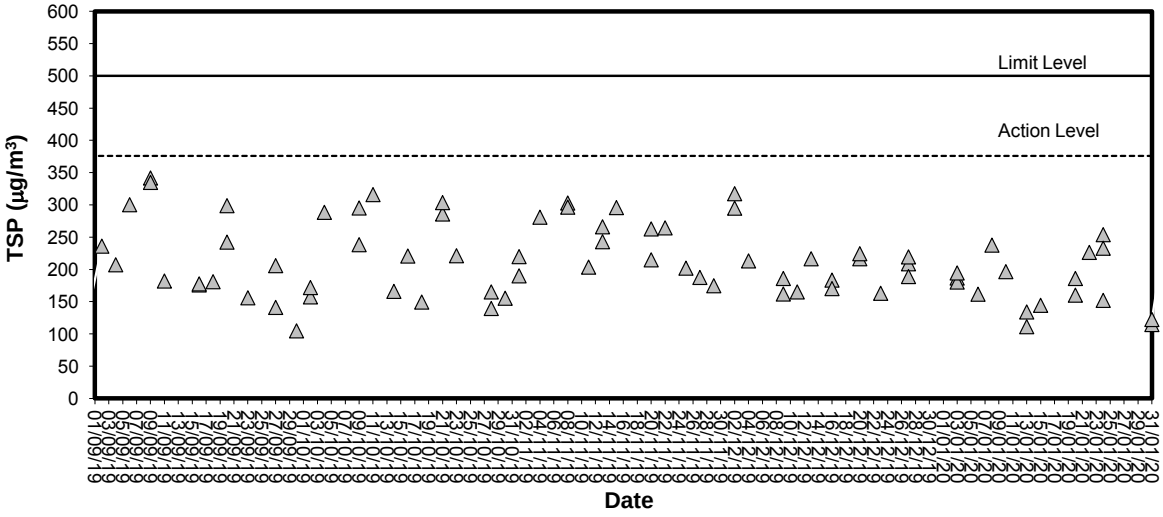
# B

# Graphical Plots of Air Quality Monitoring Data

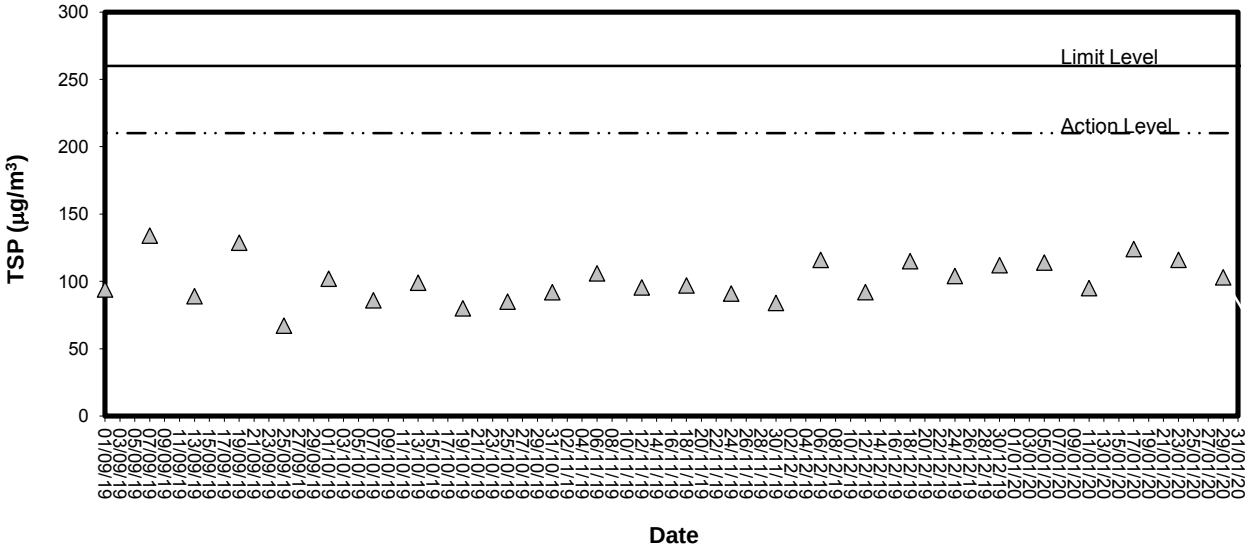
**1-hour TSP level at TKO-A1**



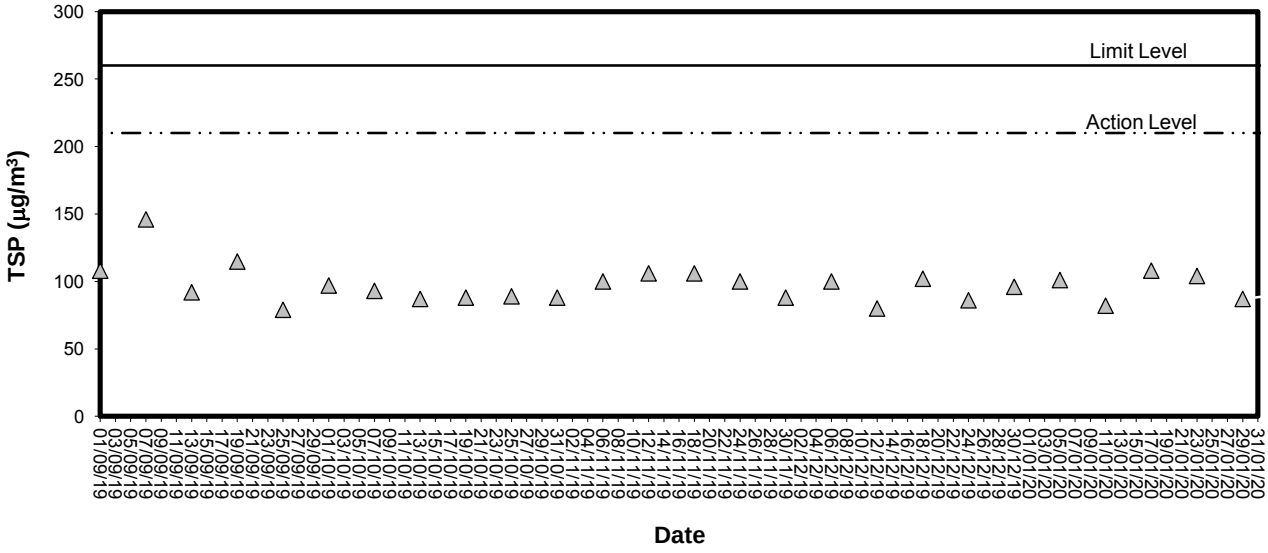

**1-hour TSP level at TKO-A2a**



## 24-hour TSP level at TKO-A1




## 24-hour TSP level at TKO-A2a

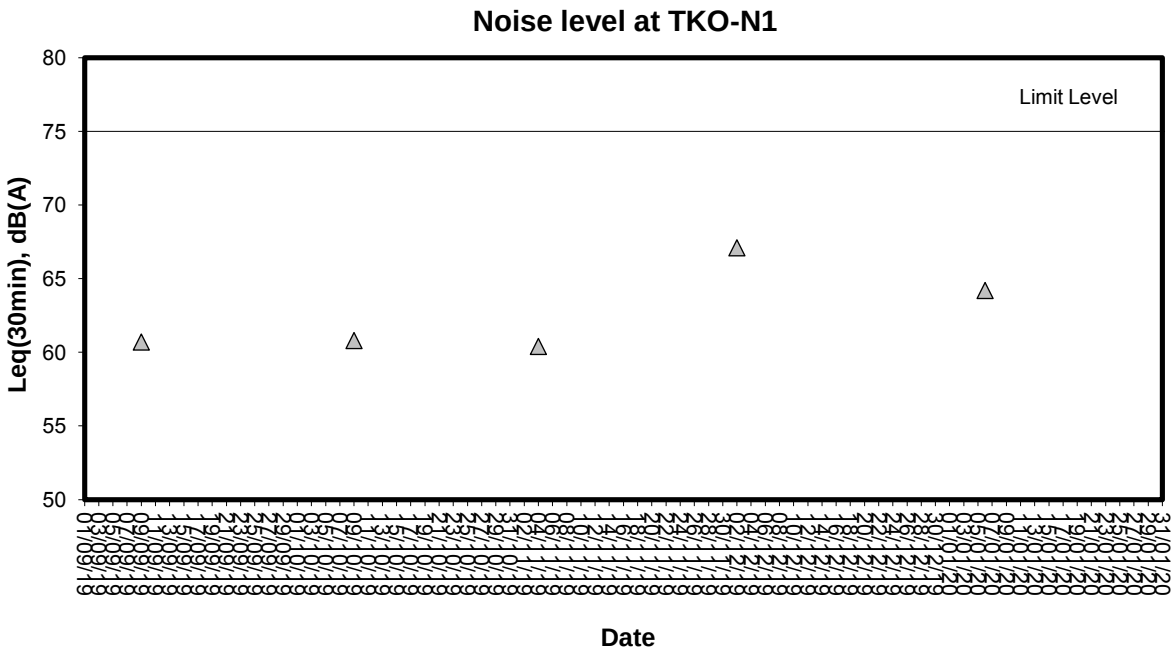


# Appendix

# C

# Graphical Plots of Noise Monitoring Data

# Noise Monitoring (Day-time)

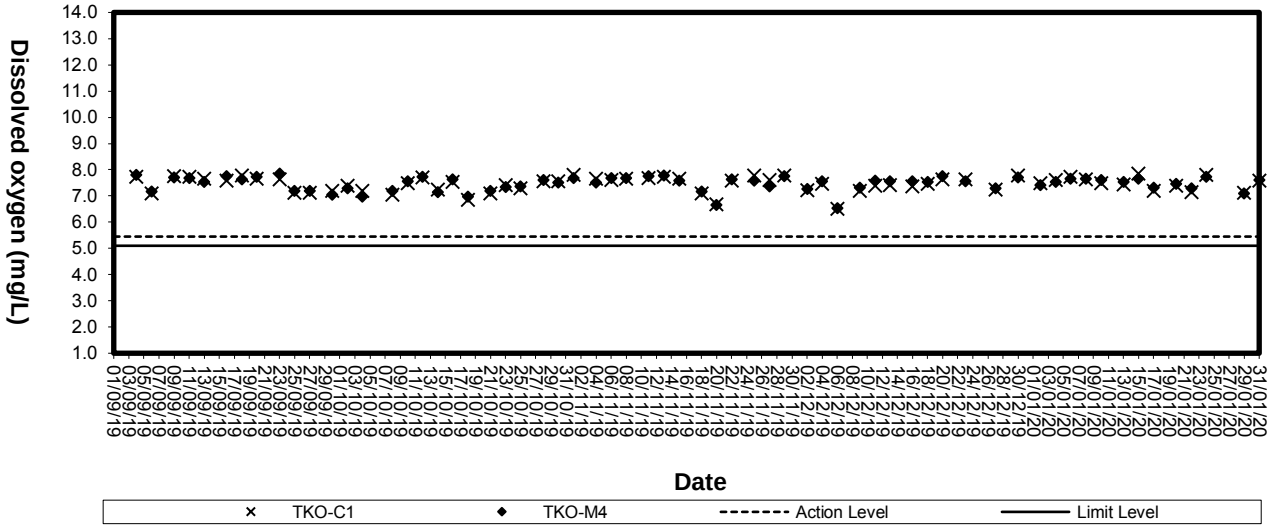


# Appendix

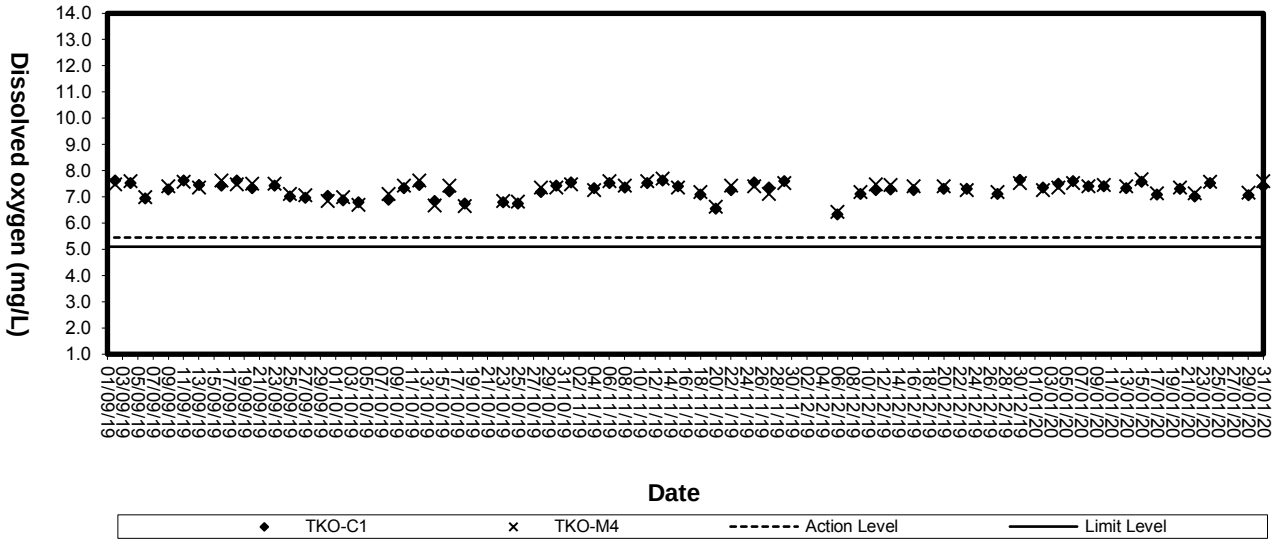
# D1

# Graphical Plots of Impact Marine Water Quality Monitoring Data

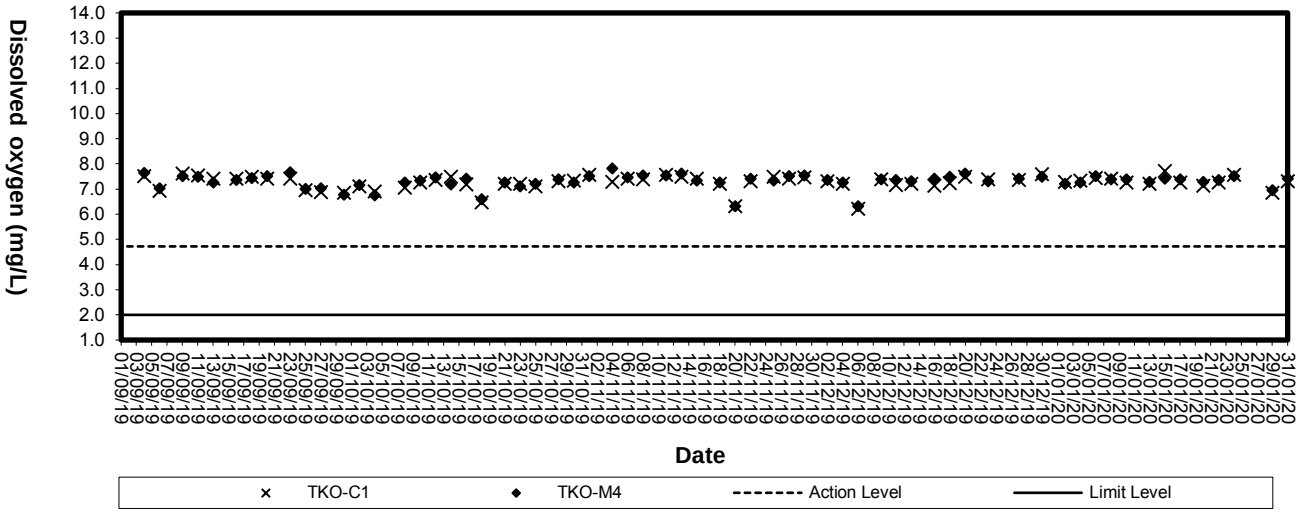
## Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



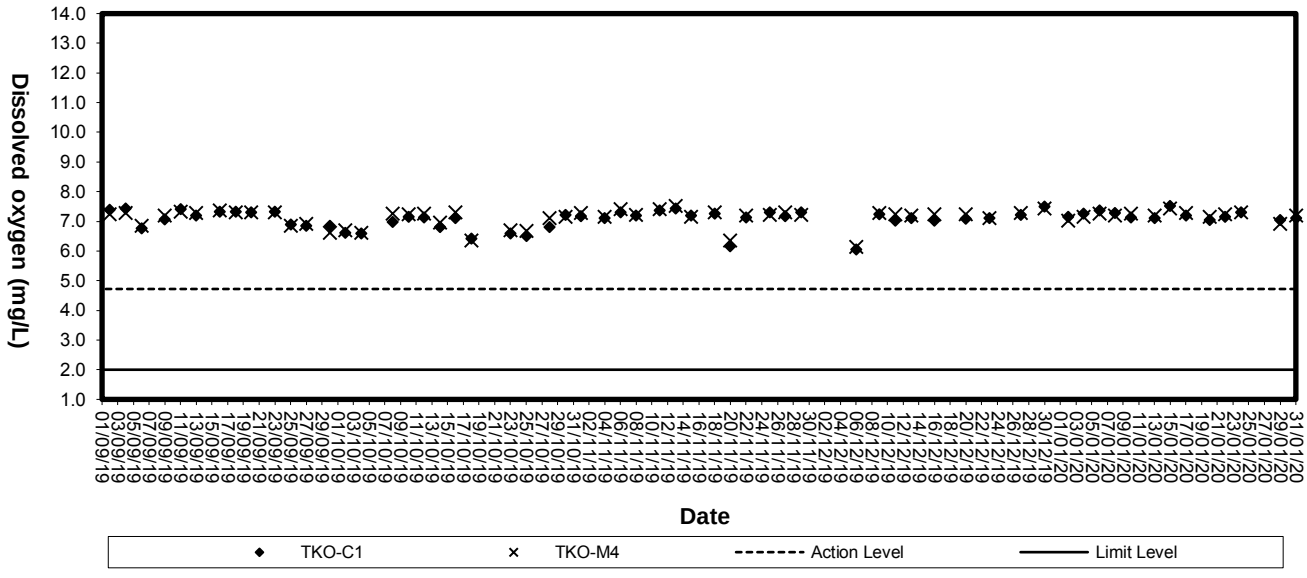

## Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



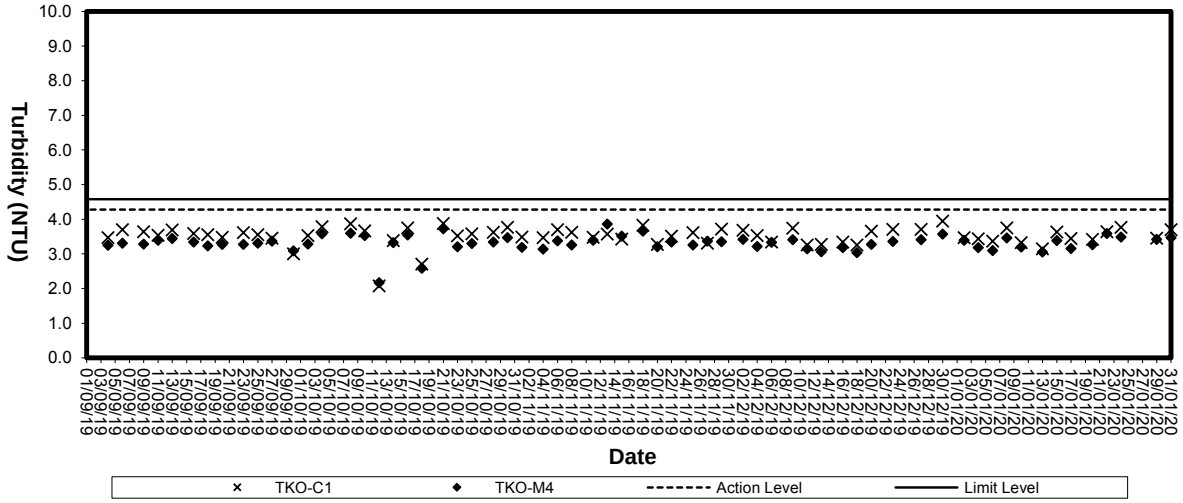
## Dissolved Oxygen (Bottom) at Mid-Flood Tide



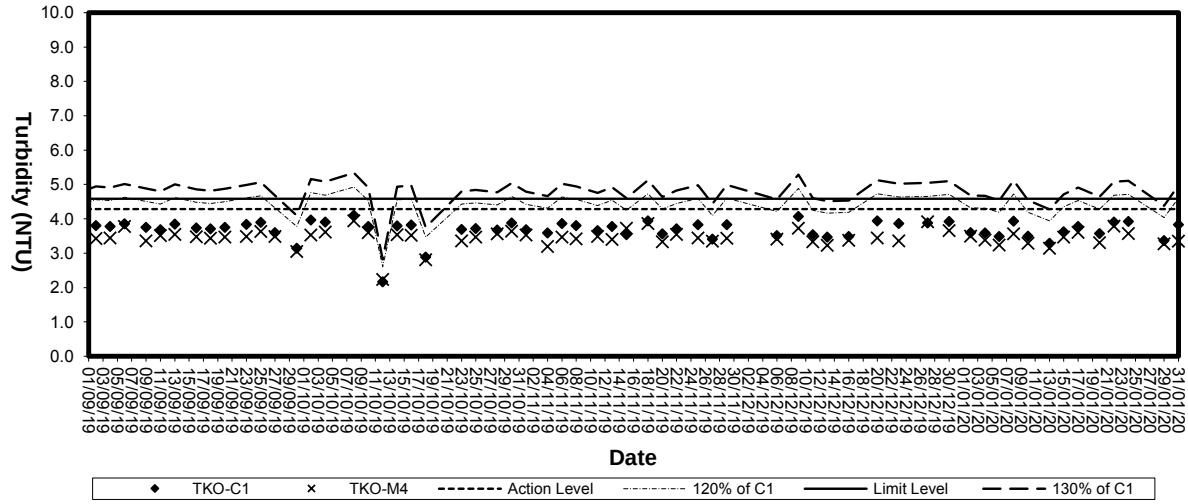

## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



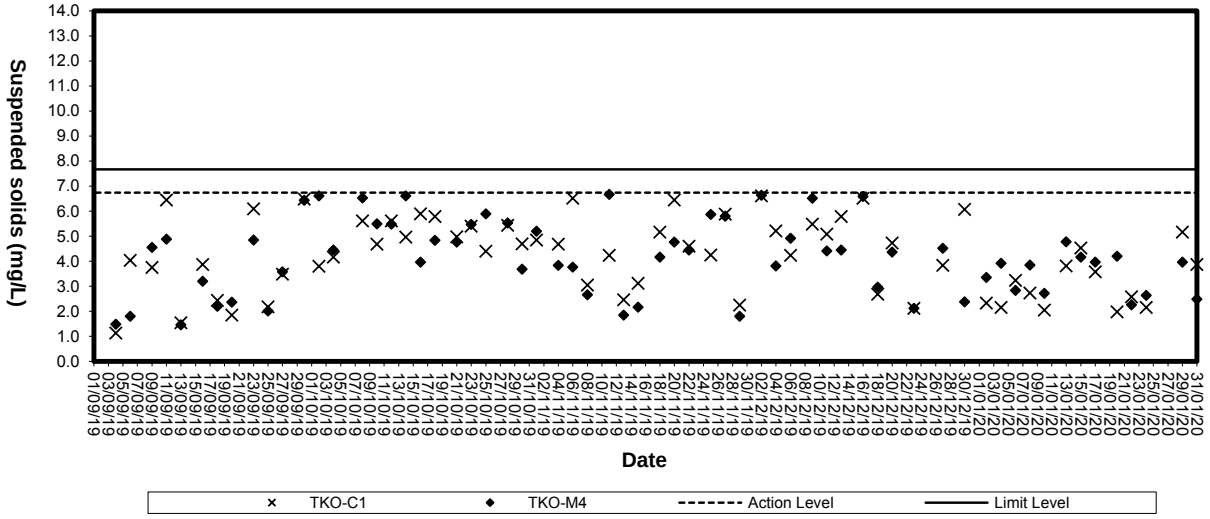
## Turbidity (Depth-average) at Mid-Flood Tide



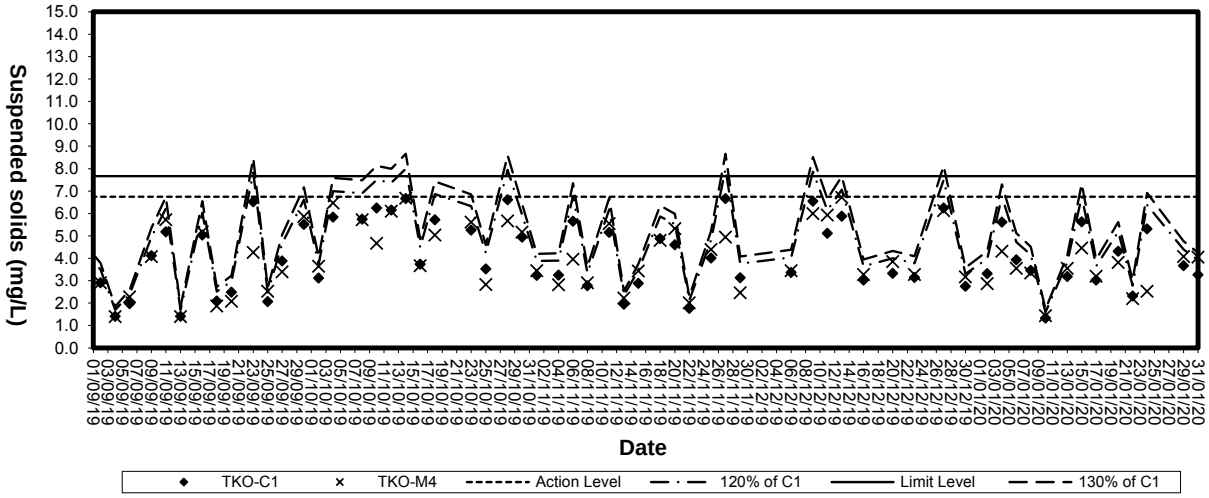

## Turbidity(Depth-average) at Mid-Ebb Tide



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




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

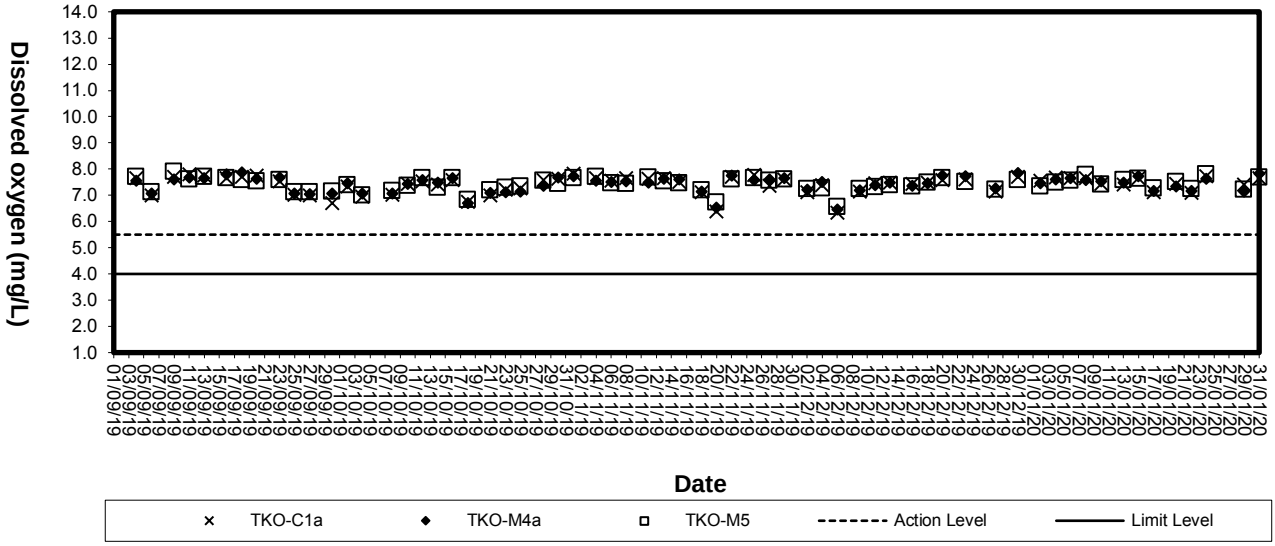


# Appendix

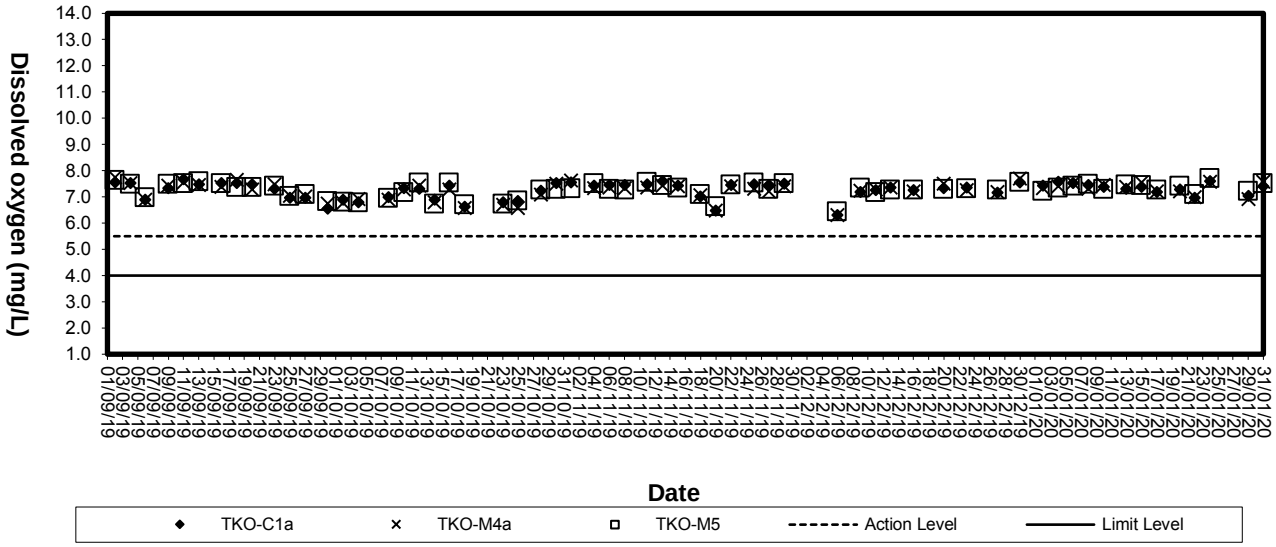
# D2

# Graphical Plots of Impact Marine Water Quality Monitoring Data (3RS project)

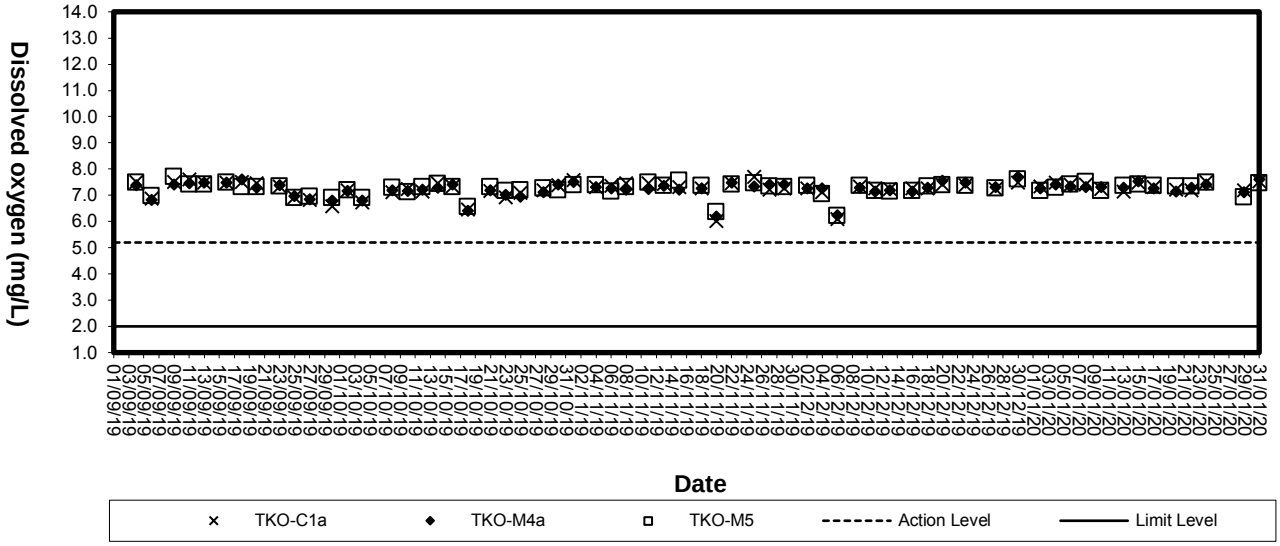
## Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide (3RS project)



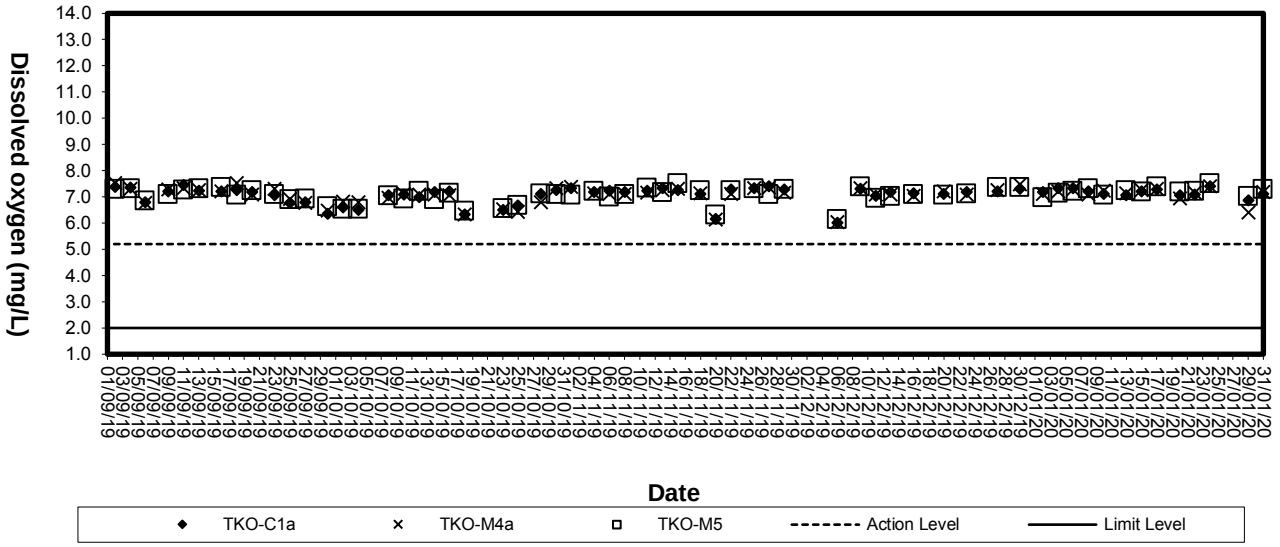

## Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide (3RS project)



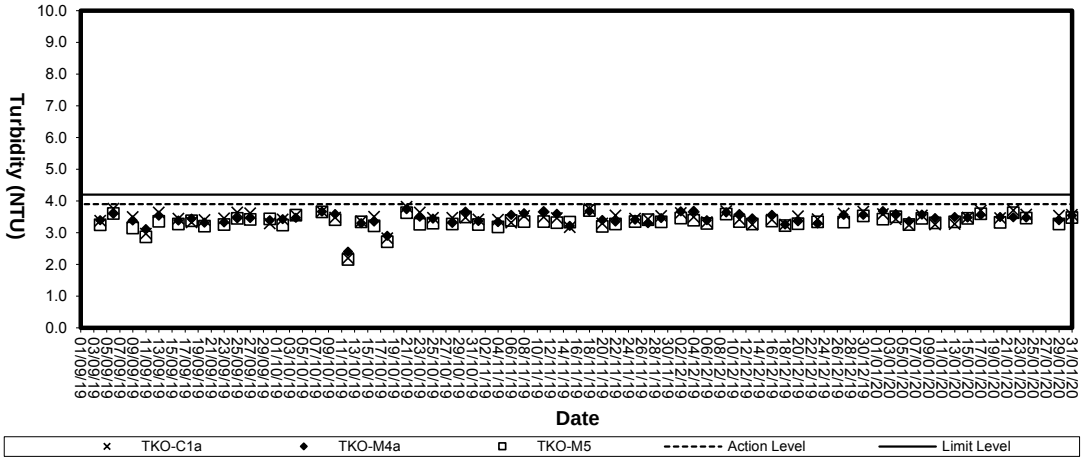
## Dissolved Oxygen (Bottom) at Mid-Flood Tide (3RS project)



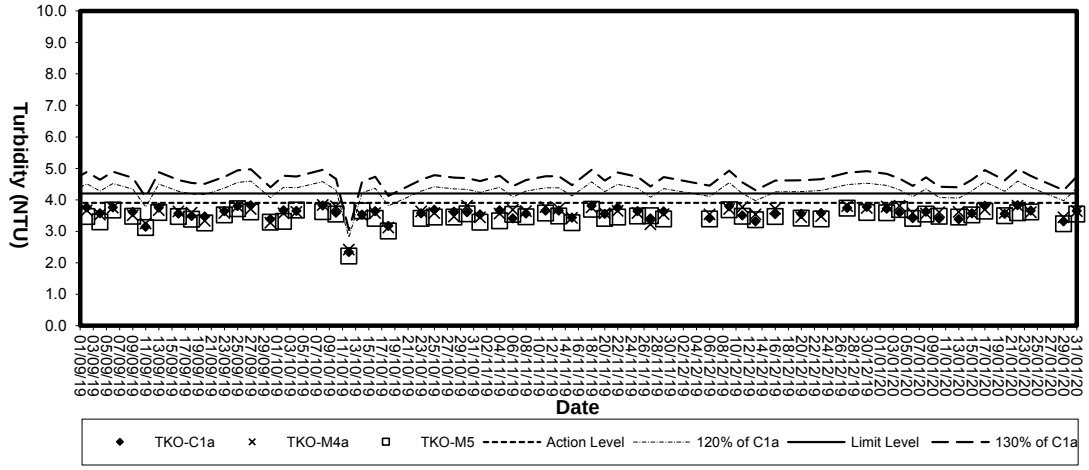

## Dissolved Oxygen (Bottom) at Mid-Ebb Tide (3RS project)



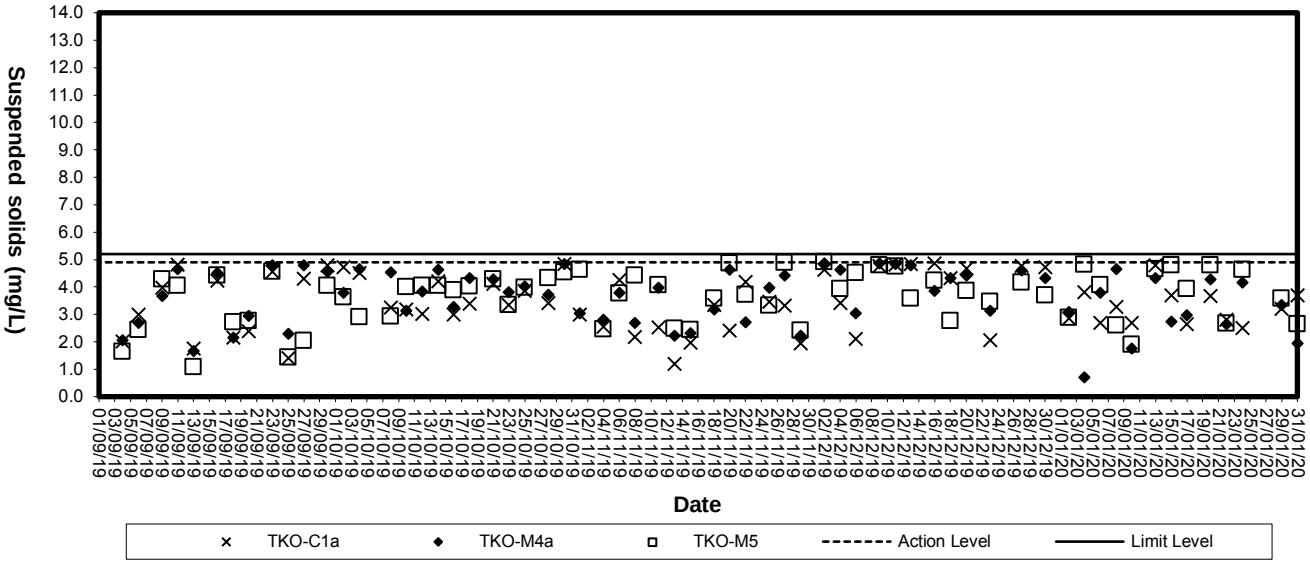
**Turbidity (Depth-average) at Mid-Flood Tide (3RS project)**



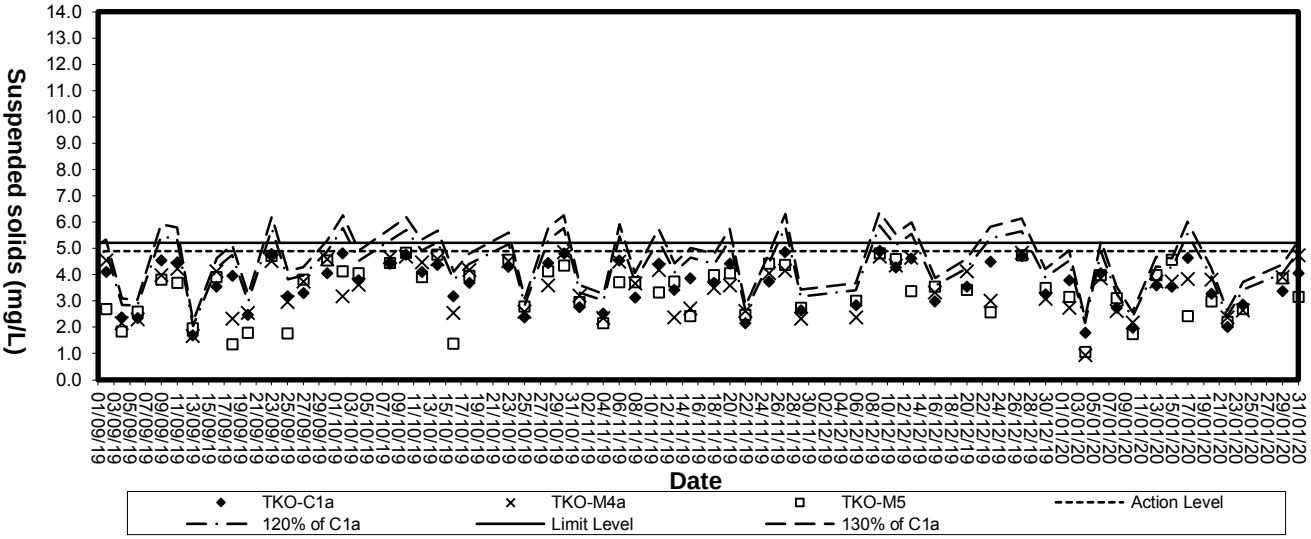

**Turbidity(Depth-average) at Mid-Ebb Tide (3RS project)**



## Suspended solids (Depth-average) at Mid-Flood Tide (3RS project)




## Suspended Solids (Depth-average) at Mid-Ebb Tide (3RS project)



# Appendix

# E

# Environmental Quality Performance (Action / Limit Levels)

**Action and Limit Levels for Air Quality**

***Action and Limit Levels for 1-Hour TSP***

| Location | Action Level, $\mu g/m^3$ | Limit Level, $\mu g/m^3$ |
|---|---|---|
| A1 | 376 | 500 |
| A2 | | |

***Action and Limit Levels for 24-Hour TSP***

| Location | Action Level, $\mu g/m^3$ | Limit Level, $\mu g/m^3$ |
|---|---|---|
| A1 | 210 | 260 |
| A2 | | |

**Action and Limit Levels for Noise**

| Time Period | Action | Limit |
|---|---|---|
| 0900-2100 hrs on all days | When one documented complaint is received | 75*dB(A) |

**Action and Limit Levels for Water Quality**

| Parameters | Action | Limit |
|---|---|---|
| Dissolved oxygen, DO mg/L (Surface, Middle & Bottom) | Surface & Middle<br>DO < 5.45<br>(5%-ile of baseline data)<br>Bottom<br>DO < 4.72<br>(5%-ile of baseline data) | Surface & Middle<br>DO < 5.10<br>(1%-ile of baseline data)<br>Bottom<br>2 mg/L |
| Suspended solids, SS mg/L (Depth-averaged) | SS > 6.74<br>(95%-ile of baseline data or SS > 120% of upstream control stations SS at the same tide of the same day) | SS > 7.67<br>(99%-ile of baseline data or SS > 130% of upstream control stations SS at the same tide of the same day) |
| Turbidity, Tby NTU (Depth-averaged) | Tby > 4.28<br>(95%-ile of baseline data or Tby > 120% of upstream control stations Tby at the same tide of the same day) | Tby > 4.58<br>(99%-ile of baseline data or Tby > 130% of upstream control stations Tby at the same tide of the same day) |

Action and Limit Levels for Water Quality (3RS project)

| *Parameter* | *Action Level* | *Limit Level* |
|---|---|---|
| *DO (mg/L)* | *Surface & Middle*<br>*<5.5 mg/L*<br>*Bottom*<br>*<5.2 mg/L* | *Surface & Middle*<br>*<4.00 mg/L (1%-ile of baseline data)*<br>*Bottom*<br>*<2.00 mg/L* |
| *SS (mg/L) (Depth-averaged)* | *>4.9 mg/L or >120% of the upstream control station's SS at the same tide on the same day* | *>5.2 mg/L or >130% of the upstream control station's SS at the same tide on the same day* |
| *Turbidity (NTU) (Depth-averaged)* | *>3.9NTU or >120% of the upstream control station's turbidity at the same tide on the same day* | *>4.2 NTU or >130% of the upstream control station's turbidity at the same tide on the same day* |

# Appendix

# F

# Event-Action Plans

# EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | ET Leader | IC(E) | ER | Contractor |
| **ACTION LEVEL** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Inform ER, IC(E) and Contractor<br>3. Repeat measurement to confirm finding<br>4. Increase monitoring frequency to daily | 1. Check monitoring data submitted by the ET<br>2. Check contractor's working method | 1. Notify Contractor | 1. Rectify any unacceptable practise<br>2. Amend working methods if appropriate |
| 2. Exceedance for two or more consecutive samples | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Inform IC(E) and Contractor<br>3. Repeat measurements to confirm finding<br>4. Increase monitoring frequency to daily<br>5. Discuss with IC(E) and Contractor on remedial actions<br>6. If exceedance continues, arrange meeting with IC(E) and ER.<br>7. If exceedance stops, cease additional monitoring | 1. Check monitoring data submitted by the ET Leader<br>2. Check the Contractor's working method<br>3. Discuss with ET and Contractor on possible remedial measures<br>4. Advise the ER on the effectiveness of the proposed remedial measures<br>5. Supervise implementation of remedial measures | 1. Confirm receipt of notification of failure in writing<br>2. Notify the Contractor<br>3. Ensure remedial measures properly implemented | 1. Submit proposals for remedial actions to IC(E) within 3 working days of notification<br>2. Implement the agreed proposals<br>3. Amend proposal if appropriate |
| **LIMIT LEVEL** | | | | |
| 1. Exceedance for one sample | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Inform ER, Contractor and EPD<br>3. Repeat measurement to confirm finding<br>4. Increase monitoring frequency to daily<br>5. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results | 1. Check monitoring data submitted by the ET Leader<br>2. Check Contractor's working method<br>3. Discuss with ET and Contractor on possible remedial measures<br>4. Advise the ER on the effectiveness of the proposed remedial measures<br>5. Supervise implementation of remedial measures | 1. Confirm receipt of notification of failure in writing<br>2. Notify the Contractor<br>3. Ensure remedial measures properly implemented | 1. Take immediate action to avoid further exceedance<br>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification<br>3. Implement the agreed proposals<br>4. Amend proposal if appropriate. |

| EVENT | EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE | | | |
|---|---|---|---|---|
| | ACTION | | | |
| | ET Leader | IC(E) | ER | Contractor |
| 2. Exceedance for two or more consecutive samples | 1. Identify source, investigate the causes of exceedance and propose remedial measures<br>2. Notify IC(E), ER, EPD and Contractor<br>3. Repeat measurement to confirm finding<br>4. Increase monitoring frequency to daily<br>5. Carry out analysis of contractor's working procedures to determine possible mitigation to be implemented<br>6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken<br>7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results<br>8. If exceedance stops, cease additional monitoring | 1. Discuss amongst ER, ET and Contractor on the potential remedial actions<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly<br>3. Supervise the implementation of remedial measures | 1. Confirm receipt of notification of failure in writing<br>2. Notify Contractor<br>3. In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented<br>4. Ensure remedial measures are properly implemented<br>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 | 1. Take immediate action to avoid further exceedances<br>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification<br>3. Implement the agreed proposals<br>4. Resubmit proposals if problem still not under control<br>5. Stop the relevant activity of works as determined by the ER until the exceedance is abated |

## EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | **ET Leader** | **IC(E)** | **ER** | **Contractor** |
| Action Level | 1. Notify the IC(E) and the Contractor.<br>2. Carry out investigation.<br>3. Report the results of investigation to the IC(E) and the Contractor.<br>4. Discuss with the Contractor and formulate remedial measures.<br>5. Increase monitoring frequency to check mitigation effectiveness | 1. Review the analysed results submitted by the ET.<br>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented. | 1. Submit noise mitigation proposals to IC(E).<br>2. Implement noise mitigation proposals. |
| Limit Level | 1. Notify the IC(E), the ER, the EPD and the Contractor.<br>2. Identify source.<br>3. Repeat measurement to confirm findings.<br>4. Increase monitoring frequency.<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.<br>6. Inform the IC(E), the ER and the EPD the causes & actions taken for the exceedances.<br>7. Assess effectiveness of Contractor's remedial actions and keep the IC(E), the EPD and the ER informed of the results<br>8. If exceedance due to the construction works stops, cease additional monitoring | 1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions.<br>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented.<br>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. | 1. Take immediate action to avoid further exceedance<br>2. Submit proposals for remedial actions to IC(E) within 3 working days of notification.<br>3. Implement the agreed proposals.<br>4. Resubmit proposals if problem still not under control.<br>5. Stop the relevant activity of works as determined by the ER until the exceedances is abated. |

| Event | EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE | | | |
|---|---|---|---|---|
| | ACTION | | | |
| | ET Leader | Contractor | ER | IEC |
| Action level being exceeded by one sampling day | 1. Identify source(s) of impact;<br>2. Repeat in-situ measurement to confirm findings;<br>3. Notify Contractor in writing within 24 hours of identification of the exceedance<br>4. Check monitoring data, all plant, equipment and Contractor's working methods;<br>5. Carry out investigation<br>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<br>7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days<br>8. Repeat measurement on next day of exceedance if exceedance is due to the construction works | 1. Notify the ER and IEC in writing within 24 hours of identification of exceedance<br>2. Rectify unacceptable practice;<br>3. Check all plant and equipment;<br>4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance<br>5. Consider changes of working method if exceedance is due to the construction works<br>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<br>7. Implement the agreed mitigation measures within reasonable time scale | 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the Identification of the exceedance<br>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;<br>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works<br>4. Ensure remedial measures are properly implemented<br>5. Assess the effectiveness of the mitigation measure | 1. Check monitoring data submitted by ET<br>2. Confirm ET assessment if exceedance is due / not due to the works<br>3. Discuss with ET, ER and Contractor on the mitigation measures<br>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly<br>5. Supervise the implementation of mitigation measures |

| Event | EVENT AND ACTION PLAN FOR WATER QUALITY | | | |
|---|---|---|---|---|
| | ACTION | | | |
| | ET Leader | Contractor | ER | IEC |
| Action level being exceeded by more than one consecutive sampling days | 1. Identify source(s) of impact;<br>2. Repeat in-situ measurement to confirm findings<br>3. Notify Contractor in writing within 24 hours of identification<br>4. Check monitoring data, all plant, equipment and Contractor's working methods;<br>5. Carry out investigation<br>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<br>7. Discuss mitigation measures with IEC and Contractor within 4 working of identification of an exceedance<br>8. Ensure mitigation measures are implemented;<br>9. Prepare to increase the monitoring frequency to daily;<br>10. Repeat measurement on next day of exceedance. | 1. Notify IEC and ER in writing within 24 hours of identification of exceedance<br>2. Rectify unacceptable practice;<br>3. Check all plant and equipment;<br>4. Consider changes of working methods;<br>5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance<br>6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of identification of an exceedance<br>7. Implement the agreed mitigation measures within reasonable time scale | 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance<br>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;<br>3. Require contractor to propose remedial measures for the analysed problem if related to the construction works<br>4. Ensure remedial measures are properly implemented<br>5. Assess the effectiveness of the mitigation measure | 1. Check monitoring data submitted by ET<br>2. Confirm ET assessment if exceedance is due / not due to the works<br>3. Discuss with ET, ER and Contractor on the mitigation measures.<br>4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly<br>5. Assess the effectiveness of the implemented mitigation measures. |

| Event | EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE | | | |
|---|---|---|---|---|
| | ACTION | | | |
| | ET Leader | Contractor | ER | IEC |
| Limit level being exceeded by one sampling day | 1. Repeat in-situ measurement to confirm findings;<br>2. Identify source(s) of impact;<br>3. Notify Contractor in writing within 24 hours of identification of the exceedance<br>4. Check monitoring data, all plant, equipment and Contractor's working methods;<br>5. Carry out investigation<br>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<br>7. Discuss mitigation measures with IEC, ER and Contractor within 4 working of identification of an exceedance<br>8. Ensure mitigation measures are implemented;<br>9. Increase the monitoring frequency to daily until no exceedance of Limit Level. | 1. Notify IEC and ER in writing; within 24 hours of the identification of the exceedance<br>2. Rectify unacceptable practice;<br>3. Check all plant and equipment;<br>4. Consider changes of working methods;<br>5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance<br>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<br>7. Implement the agreed mitigation measures within reasonable time scale | 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance<br>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;<br>3. Request Contractor to critically review the working methods;<br>4. Ensure remedial measures are properly implemented<br>5. Assess the effectiveness of the implemented mitigation measures. | 1. Check monitoring data submitted by ET<br>2. Confirm ET assessment if exceedance is due / not due to the works<br>3. Discuss with ET, ER and Contractor on the mitigation measures.<br>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.<br>5. Assess the effectiveness of the implemented mitigation measures |

| Event | EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE | | | |
|---|---|---|---|---|
| | ACTION | | | |
| | ET Leader | Contractor | ER | IEC |
| Limit Level being exceeded by more than one consecutive sampling days | 1. Repeat in-situ measurement to confirm findings;<br>2. Identify source(s) of impact;<br>3. Notify Contractor in writing within 24 hours of identification of the exceedance<br>4. Check monitoring data, all plant, equipment and Contractor's working methods;<br>5. Carry out investigation<br>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<br>7. Discuss mitigation measures with IEC, ER and Contractor;<br>8. Ensure mitigation measures are implemented;<br>9. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days. | 1. Notify ER and IEC in writing within 24 hours of the identification of the exceedance and<br>2. Rectify unacceptable practice;<br>3. Check all plant and equipment;<br>4. Consider changes of working methods;<br>8. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance<br>5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days;<br>6. Implement the agreed mitigation measures within reasonable time scale<br>7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction actives. | 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance<br>2. Discuss with IEC, ET and Contractor on the proposed mitigation measures;<br>3. Request Contractor to critically review the working methods;<br>6. Ensure remedial measures are properly implemented<br>4. Assess the effectiveness of the implemented mitigation measures;<br>5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level. | 1. Check monitoring data submitted by ET<br>2. Confirm ET assessment if exceedance is due / not due to the works<br>3. Discuss with ER, ET and Contractor on the mitigation measures.<br>4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly.<br>5. Assess the effectiveness of the implemented mitigation measures. |

# Appendix

# G

# Work Programme

**China Harbour - Zhen Hua Joint Venture**
**Contract No. CV/2015/07**
**Handling of Surplus Public Fill (2016 -2018)**

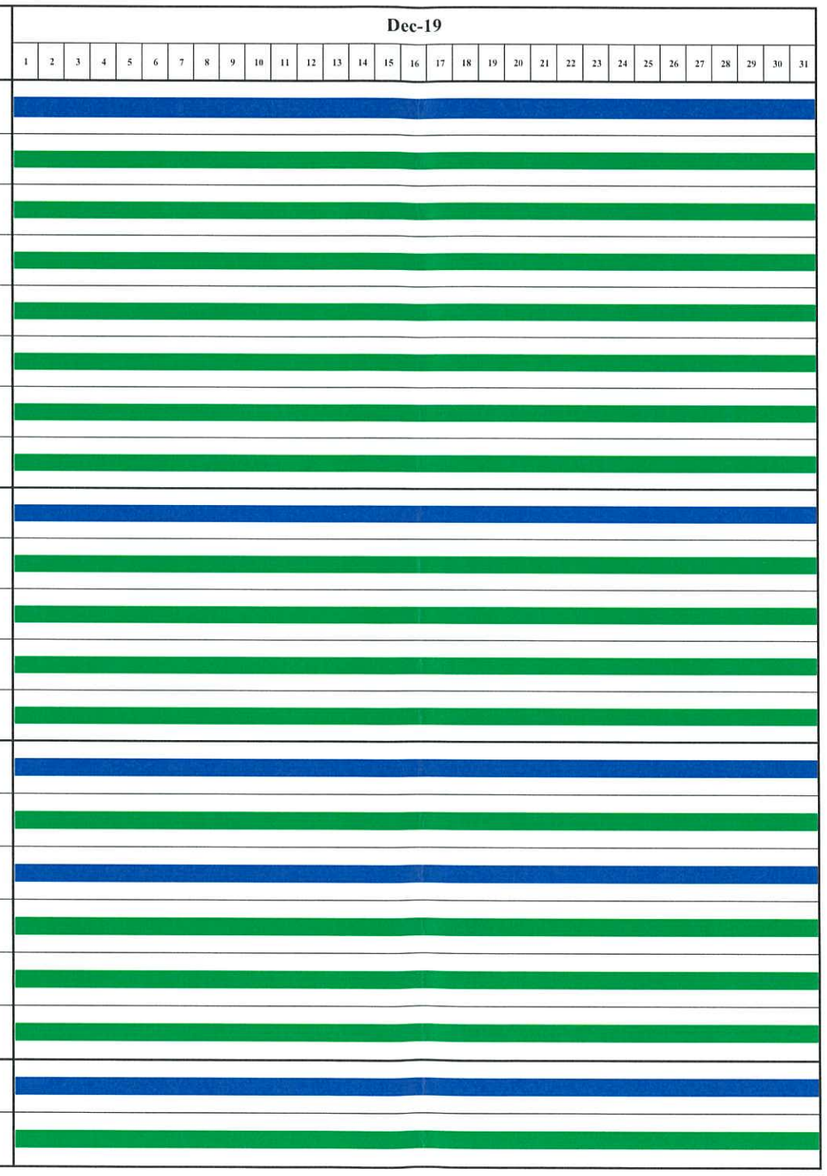
**Three Months Rolling Programme (1-September-2019 to 30-November-2019)**

| Item | Description | From | To |
|---|---|---|---|
| 1 | Section 1A | 1-Sep-19 | 1-Oct-19 |
| 1.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Sep-19 | 1-Oct-19 |
| 1.2 | Operation of crushing plants | 1-Sep-19 | 1-Oct-19 |
| 1.3 | Operation of the existing and expanded dewatering plants | 1-Sep-19 | 1-Oct-19 |
| 1.4 | Collection and delivery of Public Fill from CWPFBP and MWPFRF to TKOFB | 1-Sep-19 | 1-Oct-19 |
| 1.5 | Breaking up the incoming precast concrete units | 1-Sep-19 | 1-Oct-19 |
| 1.6 | Carry out repair works for damages caused by Super Typhoon | 1-Sep-19 | 1-Oct-19 |
| 1.7 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Sep-19 | 1-Oct-19 |
| 2 | Section 2A | 1-Sep-19 | 1-Oct-19 |
| 2.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Sep-19 | 1-Oct-19 |
| 2.2 | Breaking up the incoming precast concrete units | 1-Sep-19 | 1-Oct-19 |
| 2.3 | Operation of glass cullet storage compartment at Portion B7 | 1-Sep-19 | 1-Oct-19 |
| 2.4 | Construction of transformer room and meter room | 1-Sep-19 | 1-Oct-19 |
| 2.5 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Sep-19 | 1-Oct-19 |
| 3 | Section 3 | 1-Sep-19 | 31-Oct-19 |
| 3.1 | Design and construction of of seawalls at Zone B (approx. 900m) | 1-Sep-19 | 31-Oct-19 |
| 4 | Section 3A | 1-Sep-19 | 31-Oct-19 |
| 4.1 | Design, construction and operation of new berthing facilities at Zone B | 1-Sep-19 | 31-Oct-19 |
| 4.2 | Design, construction and operation of new navigation channel and turning basin inassociated with the berthing facilities at Zone B | 1-Sep-19 | 31-Oct-19 |
| 4.3 | Design and construction of seawalls at Zone B (approx. 1500m) | 1-Sep-19 | 31-Oct-19 |
| 5 | Section 4 | 1-Sep-19 | 30-Nov-19 |
| 5.1 | Collection and delivery of Public Fill to the Designated Reclamation Sites in the Mainland | 1-Sep-19 | 30-Nov-19 |
| 6 | Section 6 | 1-Sep-19 | 5-Oct-19 |
| 6.1 | Removal of existing stockpiled Public Fill at Portion A5b down to +5.2mPD | 1-Sep-19 | 5-Oct-19 |

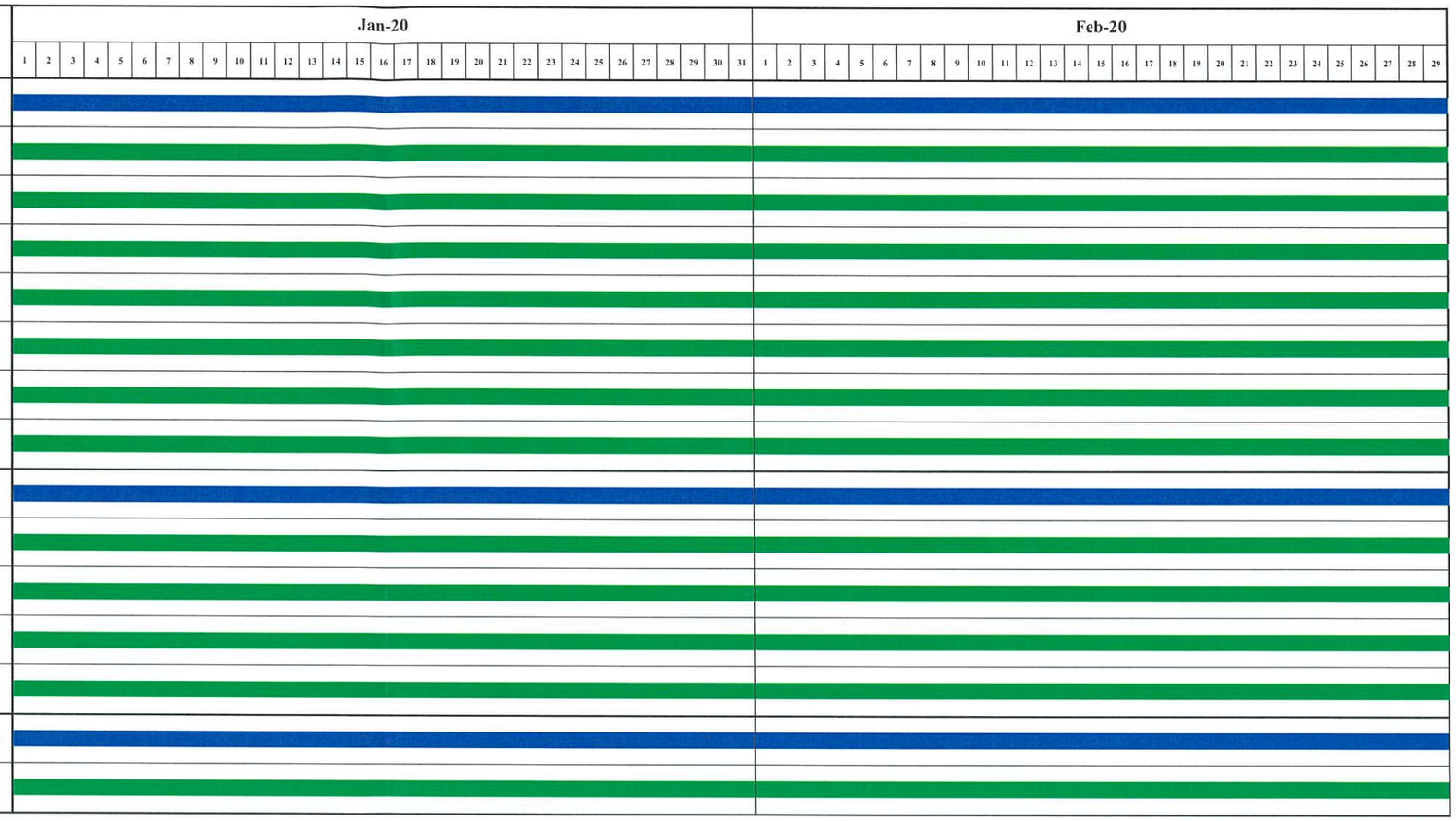
**China Harbour - Zhen Hua Joint Venture**
**Contract No. CV/2015/07**
**Handling of Surplus Public Fill (2016 -2018)**

**Three Months Rolling Programme for the Period from 1-December-2019 to 29-February-2020**
**(From 1-December-2019 to 31-December-2019 for Main Contract CV/2015/07 and From 1-January-2020 to 29-February-2020 for Supplementary Agreement No.1 of Main Contract CV/2015/07)**

| Item | Description | From | To |
|---|---|---|---|
| 1 | Section 1A | 1-Dec-19 | 31-Dec-19 |
| 1.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Dec-19 | 31-Dec-19 |
| 1.2 | Operation of crushing plants | 1-Dec-19 | 31-Dec-19 |
| 1.3 | Operation of the existing and expanded dewatering plants | 1-Dec-19 | 31-Dec-19 |
| 1.4 | Collection and delivery of Public Fill from CWPFBP and MWPFRF to TKOFB | 1-Dec-19 | 31-Dec-19 |
| 1.5 | Breaking up the incoming precast concrete units | 1-Dec-19 | 31-Dec-19 |
| 1.6 | Carry out repair works for damages caused by Super Typhoon | 1-Dec-19 | 31-Dec-19 |
| 1.7 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Dec-19 | 31-Dec-19 |
| 2 | Section 2A | 1-Dec-19 | 31-Dec-19 |
| 2.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Dec-19 | 31-Dec-19 |
| 2.2 | Breaking up the incoming precast concrete units | 1-Dec-19 | 31-Dec-19 |
| 2.3 | Operation of glass cullet storage compartment at Portion B7 | 1-Dec-19 | 31-Dec-19 |
| 2.4 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Dec-19 | 31-Dec-19 |
| 3 | Section 3 | 1-Dec-19 | 31-Dec-19 |
| 3.1 | Design and construction of of seawalls at Zone B (approx. 900m) | 1-Dec-19 | 31-Dec-19 |
| 4 | Section 3A | 1-Dec-19 | 31-Dec-19 |
| 4.1 | Design, construction and operation of new berthing facilities at Zone B | 1-Dec-19 | 31-Dec-19 |
| 4.2 | Design, construction and operation of new navigation channel and turning basin inassociated with the berthing facilities at Zone B | 1-Dec-19 | 31-Dec-19 |
| 4.3 | Design and construction of seawalls at Zone B (approx. 1500m) | 1-Dec-19 | 31-Dec-19 |
| 5 | Section 4 | 1-Dec-19 | 31-Dec-19 |
| 5.1 | Collection and delivery of Public Fill to the Designated Reclamation Sites in the Mainland | 1-Dec-19 | 31-Dec-19 |



| Item | Description | From | To |
|---|---|---|---|
| 1 | Section 1B | 1-Sep-19 | 1-Oct-19 |
| 1.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Sep-19 | 1-Oct-19 |
| 1.2 | Operation of crushing plants | 1-Sep-19 | 1-Oct-19 |
| 1.3 | Operation of the existing and expanded dewatering plants | 1-Sep-19 | 1-Oct-19 |
| 1.4 | Collection and delivery of Public Fill from CWPFBP and MWPFRF to TKOFB | 1-Sep-19 | 1-Oct-19 |
| 1.5 | Breaking up the incoming precast concrete units | 1-Sep-19 | 1-Oct-19 |
| 1.6 | Carry out repair works for damages caused by Super Typhoon | 1-Sep-19 | 1-Oct-19 |
| 1.7 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Sep-19 | 1-Oct-19 |
| 2 | Section 2B | 1-Sep-19 | 1-Oct-19 |
| 2.1 | Operation of Fill Bank, surveillance system and tipping halls | 1-Sep-19 | 1-Oct-19 |
| 2.2 | Breaking up the incoming precast concrete units | 1-Sep-19 | 1-Oct-19 |
| 2.3 | Operation of glass cullet storage compartment at Portion B7 | 1-Sep-19 | 1-Oct-19 |
| 2.4 | Carry out preliminary sorting on Public Fill for Three Runway System (3RS) project | 1-Sep-19 | 1-Oct-19 |
| 5 | Section 4A | 1-Sep-19 | 30-Nov-19 |
| 5.1 | Collection and delivery of Public Fill to the Designated Reclamation Sites in the Mainland | 1-Sep-19 | 30-Nov-19 |



# Appendix

# H

# Implementation Schedule of Environmental Mitigation Measures (EMIS)

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

# *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 | | √ | | |
| • A buffer zone of at least 100m shall be maintained between the edge of the stockpiling area and the nearest ASRs at the TKO Industrial Estate. Within the buffer zone, no dusty material shall be stockpiled and no loading / unloading and similar activities should be allowed. | Northern Site Boundary | √ | | | |
| • Water sprays shall be provided and used to dampen materials. | All areas | | √ | | |
| • Regular cleaning and watering the site shall be provided to minimize the fugitive dust emissions. | All areas | √ | | | |
| • All vehicles shall be restrict to a maximum speed of 10 km per hour. | 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. | Site Egress | √ | | | |
| • The designated site main haul rout shall be paved or regular watering. | All haul roads | √ | | | |
| • Frequent watering of work site shall be at least three times per day. | 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, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD. | All areas | √ | | | |
| • 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. | All areas | √ | | | |
| • When fill material is transfer by belt conveyor systems, the conveyors shall be enclosed on top and 2 sides. | C&DMSF | √ | | | |
| • The belt scraper shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt. | C&DMFS | √ | | | |
| • The level of stockpiling belt conveyor shall be adjustable such that the vertical distance between the belt conveyor and the material landing point is maintained at no more than 1m. | C&DMFS | √ | | | |
| • All plant and equipment should be well maintained e.g. without black smoke emission. | | √ | | | |
| ***Noise Impact*** | | √ | | | |
| • 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 | √ | | | |

Remark: √ = Implemented, ∇ = Partially Implemented X = Not Implemented N/A = Not Applicable

| Environmental Protection Measures | Location | Implementation Status | | | |
|---|---|---|---|---|---|
| | | Implemented | Partially implemented | Not implemented | Not Applicable |
| ***Water Quality*** | | | | | |
| ▪ Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms. | All areas | √ | | | |
| ▪ The permanent drainage channels should have sediment basin, traps and baffles and maintain properly. | All areas | √ | | | |
| ▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels. | All areas | √ | | | |
| ▪ Manholes should be covered and sealed. | All areas | √ | | | |
| ▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding. | All areas | √ | | | |
| ▪ A buffer distance of at least 100m shall be maintained between the boundary of the public fill stockpiling area and the sea front. | Public fill stockpiling area | √ | | | |
| ▪ A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront. | C&DMFS | √ | | | |
| ▪ The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge. | All areas | | √ | | |
| ▪ The temporary slope surfaces, especially those facing to the north of the site shall be covered with impermeable sheet or sprayed with water or protected by other method approved by CEDD. | Temporary Slopes | √ | | | |
| ▪ Final slope surfaces, especially those facing to the north of the site shall be treated by compaction, followed by hydroseeding, vegetation planting or sealing with shotconcrete, latex, vinyl, bitumen, or other suitable surface stabilizer approved by CEDD. | Temporary Slopes | √ | | | |
| ▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. | All areas | √ | | | |
| ▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains. | Wheel Washing facility | √ | | | |
| ▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. | Wheel Washing facility | √ | | | |
| ▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities. | All areas | √ | | | |
| ▪ Oil intercept in addition of sand / silt removal facilities shall be provided at the car parking areas and work shop. | All areas | √ | | | |
| ▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water. | Barge Handling Area (BHA) | √ | | | |
| ▪ The barges shall be in right size such that adequate clearance in maintained between the vessels and the seabed at all states of the tide to ensure the undue turbidity is not generated by turbulence from vessel movement or propeller wash. | Barge Handling Area (BHA) | √ | | | |
| ▪ All vessels used for transportation of fill material shall have tight fitting seals to their bottom openings to prevent leakage of material during transport. | Barge Handling Area (BHA) | √ | | | |
| ▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer. | Along the seafront | √ | | | |
| ▪ Barges shall not be filled to a level which may cause the overflow of material during loading or transportation. Barge effluents shall be properly collected and treated before disposal. | Barge Handling Area (BHA) | √ | | | |
| ▪ The work activities shall not cause any visible foam, oil, grease, scum, litter or other objectionable matters to be present on the water in the vicinity of the barging facilities. | Along the seafront | √ | | | |
| ▪ Existing silt curtain at the outward side of the basin near the Barging Handling Area throughout the period shall be repair, maintain and service when there is public fill intake by barges to the Fill Bank in accordance with PS Clause 1.68. The total length of the silt curtains shall not be less than 160m, and a gap of about 80m shall be left open for access of barges. The silt curtain shall be properly maintained such that it can also serve the function of refuse containment boom to confine floating refuse. | Along the seafront | √ | | | |
| ▪ A waste collection vessel shall be deployed to remove floating debris. | Along the seafront | √ | | | |

Remark: √ = Implemented, ∇ = Partially Implemented X = Not Implemented N/A = Not Applicable

| Environmental Protection Measures | Location | Implementation Status | | | |
|---|---|---|---|---|---|
| | | Implemented | Partially implemented | Not implemented | Not Applicable |
| ***Landscape and Visual*** | | | | | |
| • Construction of lighting to avoid spillage and glare | All areas | √ | | | |
| • Hydroseeding | Completed slopes | √ | | | |
| • Hoarding erection | Site boundary | √ | | | |
| • Damage to surrounding area avoided | All areas | √ | | | |
| ***Other Environmental Factors*** | | | | | |
| • C&D waste sorted from mixed C&D material shall be transfer to SENT landfill for disposal. | All areas | √ | | | |
| • Plan and stock construction materials carefully to minimise generation of waste. | All areas | √ | | | |
| • Any unused materials or those with remaining functional capacity should be recycled. | All areas | √ | | | |
| • All generators, fuel and oil storage are within bunded areas. | All areas | √ | | | |
| • Oil leakage from machinery, vehicle and plant is prevented. | All areas | | √ | | |
| • Bund chemical storage area to 110% capacity. | All areas | √ | | | |
| • Prevent disposal of hazardous materials to air, soil and water body | All areas | √ | | | |
| • Provide rubbish skips at all work areas | 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 | √ | | | |
| • 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 | √ | | | |

Remark: √ = Implemented, ∇ = Partially Implemented X = Not Implemented N/A = Not Applicable

# Appendix

# I1

# Statistical Analysis of the Trend of Suspended Solids in the Quarter

## Statistical Analysis of the Trend of Suspended Solids

## For Mid-Flood Tide

**Station: M4**

**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 6.969 | 1.069 | 0.3086 |
| Quarterly Mean | 38 | 0 | 3.9952 | 1.3844 | 0.2246 |

**Result:**

Probability that two variances are equal (f-test) = 0.1177

Difference between means = 2.9738
(95% CI : 2.2064 < Diff < 3.7412)

t-value of difference = 6.8097 (48 degrees of freedom)

Calculated t-value > Critical t-value

**Conclusion:**

There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

**Station: C1**

**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 6.969 | 0.950 | 0.2742 |
| Quarterly Mean | 38 | 0 | 4.1070 | 1.4752 | 0.2393 |

**Result:**

Probability that two variances are equal (f-test) = 0.0224

Difference between means = 2.8620
(95% CI : 2.1175 < Diff < 3.6065)

t-value of difference = 7.8626 (29 degrees of freedom)

Calculated t-value > Critical t-value

**Conclusion:**

There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

## Statistical Analysis of the Trend of Suspended Solids

## For Mid-Ebb Tide

**Station: M4**

**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 6.897 | 1.449 | 0.4183 |
| Quarterly Mean | 38 | 0 | 3.4360 | 1.7874 | 0.2900 |

**Result:**

Probability that two variances are equal (f-test) = 0.1652

Difference between means = 2.8620
(95% CI : 2.1301 < Diff < 3.5939)

t-value of difference = 6.2964 (48 degrees of freedom)
P = 1 (>0.05)

Calculated t-value > Critical t-value

**Conclusion:**

There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

**Station: C1**

**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 6.933 | 1.045 | 0.3017 |
| Quarterly Mean | 38 | 0 | 3.5474 | 1.9018 | 0.3085 |

**Result:**

Probability that two variances are equal (f-test) = 0.003

Difference between means = 3.3856
(95% CI : 2.5087 < Diff < 4.2625)

t-value of difference = 7.8461 (34 degrees of freedom)

Calculated t-value > Critical t-value

**Conclusion:**

There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

# Appendix

# I2

# Statistical Analysis of the Trend of Suspended Solids in the Quarter (3RS)

## Statistical Analysis of the Trend of Suspended Solids

## For Mid-Flood Tide

**Station: C1a**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 4.158 | 1.367 | 0.3946 |
| Quarterly Mean | 38 | 0 | 3.3846 | 1.0284 | 0.1668 |

**Result:**
Probability that two variances are equal (f-test) = 0.8434
Difference between means =0.7734
(95% CI : -0.0879 < Diff < 1.6347)
t-value of difference = 2.0945 (48 degrees of freedom)
Calculated t-value > Critical t-value
**Conclusion:**
There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

**Station: M4a**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 3.902 | 1.142 | 0.3297 |
| Quarterly Mean | 38 | 0 | 3.5281 | 1.0374 | 0.1683 |

**Result:**
Probability that two variances are equal (f-test) = 0.3136
Difference between means = 0.3739
(95% CI : -0.3702 < Diff < 1.118)
t-value of difference = 1.0629 (48 degrees of freedom)
Calculated t-value < Critical t-value
**Conclusion:**
There is no statistically significant difference between the groups.

**Station: M5**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 3.936 | 1.414 | 0.4082 |
| Quarterly Mean | 38 | 0 | 3.7785 | 0.8915 | 0.1446 |

**Result:**
Probability that two variances are equal (f-test) = 0.0177
Difference between means = 0.1575
(95% CI : -0.7780 < Diff < 1.0930)
t-value of difference = 0.3637 (13 degrees of freedom)
Calculated t-value < Critical t-value
**Conclusion:**
There is no statistically significant difference between the groups.

## Statistical Analysis of the Trend of Suspended Solids

## For Mid-Ebb Tide

**Station: C1a**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 4.286 | 1.353 | 0.3906 |
| Quarterly Mean | 38 | 0 | 3.1706 | 1.4987 | 0.2431 |

**Result:**
Probability that two variances are equal (f-test) =0.3717
Difference between means =1.1154
(95% CI : 0.1903 < Diff < 2.0405)
t-value of difference = 2.2968 (48 degrees of freedom)
Calculated t-value > Critical t-value
**Conclusion:**
There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

**Station: M4a**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 4.090 | 1.325 | 0.3825 |
| Quarterly Mean | 38 | 0 | 3.0456 | 1.4851 | 0.2409 |

**Result:**
Probability that two variances are equal (f-test) = 0.2871
Difference between means =1.0444
(95% CI : 0.1356 < Diff < 1.9532)
t-value of difference = 2.1752 (48 degrees of freedom)
Calculated t-value > Critical t-value
**Conclusion:**
There is statistically significant difference between the groups.
The P-Value of 130% Baseline Mean is larger than quarterly mean = >0.99
The result of suspended solids in this reporting period is lower than that of 130% baseline.

**Station: M5**
**t-test**

| Group Name | N | Missing | Mean | Std Dev | SE |
|---|---|---|---|---|---|
| 130% Baseline Mean | 12 | 0 | 3.790 | 1.465 | 0.4229 |
| Quarterly Mean | 38 | 0 | 2.9882 | 1.4559 | 0.2362 |

**Result:**
Probability that two variances are equal (f-test) = 0.4548
Difference between means = 0.8018
(95% CI : -0.1721 < Diff < 1.7757)
t-value of difference = 1.6608 (48 degrees of freedom)
Calculated t-value < Critical t-value
**Conclusion:**
There is no statistically significant difference between the groups.

# Appendix

# J

# Site General Layout plan

CLEARWATER BAY
COUNTRY PARK
SENT LANDFILL
TAT TONG CHAU
TIT CHAM CHAU
LOCATION PLAN
HANDLING OF SURPLUS
PUBLIC FILL
(2016-2018)
FM10077-2-A
FILL MANAGEMENT DIVISION
CIVIL ENGINEERING OFFICE
CEDD
SETTING OUT DETAILS
SETTING OUT DETAILS

# Appendix

# K

# Weather Condition

# Daily Extract of Meteorological Observations , November 2019 - Tseung Kwan O

| Day | Mean Pressure (hPa) | Air Temperature | | | Mean Dew Point (deg. C) | Mean Relative Humidity (%) | Total Rainfall (mm) | Prevailing Wind Direction (degrees) | Mean Wind Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|
| | | Absolute Daily (deg. C) | Mean (deg. | Absolute Daily (deg. C) | | | | | |
| 1 | *** | 29.3 | 25.2 | 22.8 | 19.3 | 70 | 0 | 20 | 8.6 |
| 2 | *** | 28.1 | 24.3 | 22.2 | 19 | 73 | 0 | 50 | 5.4 |
| 3 | *** | 29 | 24.4 | 21.8 | 20.1 | 78 | 0 | 20 | 5.5 |
| 4 | *** | 29 | 23.5 | 20.5 | 14.6 | 59 | 0 | 340 | 6.6 |
| 5 | *** | 27.3 | 22.2 | 19.1 | 13.4 | 59 | 0 | 340 | 5.4 |
| 6 | *** | 26.3 | 22.6 | 20.3 | 16.2 | 68 | 0 | 60 | 6 |
| 7 | *** | 27.5# | 22.3 | 18.7# | 13.2 | 59 | 0 | 340 | 5.9 |
| 8 | *** | 27.3# | 22 | 18.3# | 11.4 | 52 | 0 | 330 | 7 |
| 9 | *** | 25.8# | 21.8 | 18.6# | 13.5 | 60 | 0 | 340 | 7.1 |
| 10 | *** | 26.9# | 21.4 | 18.0# | 15.5 | 71 | 0 | 10 | 5.5 |
| 11 | *** | 26.5# | 21.8 | 17.4# | 16.4 | 73 | 0 | 70 | 5.1 |
| 12 | *** | 24.0# | 22.4 | 21.4# | 18.2 | 77 | 0 | 10 | 6.5 |
| 13 | *** | 27.0# | 22.8 | 20.6# | 18.1 | 76 | 0 | 10 | 6 |
| 14 | *** | 26.0# | 22 | 19.2# | 14.3 | 62 | 0 | 60 | 6.8 |
| 15 | *** | 25.7# | 22 | 19.7# | 15.4 | 66 | 0 | 70 | 5.8 |
| 16 | *** | 25.5# | 21.6 | 19.0# | 16.7 | 74 | 0 | 070# | 5.0# |
| 17 | *** | 27.7# | 22.3 | 19.5# | 18.2 | 79 | 0 | 20 | 5.3 |
| 18 | *** | 30.4 | 23.2 | 18.6 | 16 | 67 | 0 | 50 | 6.4 |
| 19 | *** | 23 | 19.2 | 15.9 | 11.9 | 63 | 0 | 60 | 6 |
| 20 | *** | 24.6 | 19.9 | 16.7 | 13.1 | 66 | 0 | 330 | 5 |
| 21 | *** | 25.8 | 20.4 | 16.8 | 13.9 | 68 | 0 | 70 | 4.3 |
| 22 | *** | 27.9# | 20.9# | 15.6# | 13.5# | 66# | 0.0# | 310# | 3.4# |
| 23 | *** | 27.7# | 22.1 | 18.0# | 17.8 | 78 | 0 | 320 | 3.7 |
| 24 | *** | 28.3 | 22.1 | 18.1 | 17.9 | 79 | 0 | 70 | 4.7 |
| 25 | *** | 26.6 | 22.7 | 20.2 | 17.7 | 74 | 0 | 60 | 6.9 |
| 26 | *** | 23.0# | 21.3 | 19.7# | 16.1 | 72 | 0 | 60 | 7.9 |
| 27 | *** | 24.9 | 21.7 | 20.2 | 16.8 | 74 | 0 | 60 | 7.8 |
| 28 | *** | 23.5# | 19.4 | 16.7# | 10.3 | 56 | 0 | 60 | 9.8 |
| 29 | *** | 23.1 | 19 | 15.1 | 10.9 | 60 | 0 | 50 | 8.1 |
| 30 | *** | 24.1# | 19.5 | 16.3# | 13.1 | 68 | 0 | 60 | 5.9 |

*** unavailable

# data incomplete

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

Daily Extract of Meteorological Observations , December 2019 - Tseung Kwan O

| Day | Mean Pressur (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 | *** | 27.7 | 20.6 | 15.5 | 13.6 | 67 | 0 | 340 | 4.2 |
| 2 | *** | 20.9 | 16.7 | 14 | 5.8 | 49 | 0 | 50 | 9.4 |
| 3 | *** | 20.2 | 15.2 | 11.9 | 1.8 | 41 | 0 | 30 | 7.1 |
| 4 | *** | 21.5 | 16.8 | 12.1 | 0.5 | 34 | 0 | 350 | 8.5 |
| 5 | *** | 17.6# | 13.8 | 11.4# | 4 | 53 | 2 | 30 | 11.4 |
| 6 | *** | 20.3# | 16.0# | 11.4# | -1.2# | 31# | 0.5# | 360# | 11.6# |
| 7 | *** | 20.6 | 15.2 | 11.6 | -0.9 | 34 | 0 | 340 | 8.5 |
| 8 | *** | 19.9 | 14.2 | 10.9 | 1.6 | 46 | 0 | 340 | 5.8 |
| 9 | *** | 21.5 | 15.4 | 11 | 7.4 | 63 | 0 | 60 | 4.3 |
| 10 | *** | 22.1 | 16.8 | 12.4 | 10.3 | 68 | 0 | 70 | 4.5 |
| 11 | *** | 24.7 | 17.2 | 12.2 | 8.4 | 60 | 0 | 90 | 3.3 |
| 12 | *** | 22 | 18.3 | 14.8 | 10.9 | 64 | 0 | 20 | 7.6 |
| 13 | *** | 22.4 | 18.4 | 15.8 | 12.9 | 72 | 0 | 40 | 7.5 |
| 14 | *** | 23.6# | 18.7 | 15.5# | 13.3 | 73 | 0 | 020# | 6.6# |
| 15 | *** | 19.7 | 18.7 | 17.9 | 15.1 | 79 | 0 | 360 | 6.2 |
| 16 | *** | 23.8 | 20.5 | 18.7 | 15.5 | 74 | 0 | 10 | 4.3 |
| 17 | *** | 26.8 | 21.9 | 18.7 | 16.3 | 71 | 0 | 10 | 3.3 |
| 18 | *** | 28.3 | 21.6 | 18 | 17.1 | 77 | 0 | 20 | 5.5 |
| 19 | *** | 20.3 | 18.5 | 17.3 | 15.4 | 82 | 0 | 50 | 6.2 |
| 20 | *** | 21.2 | 18.1 | 16.3 | 13.1 | 73 | 1.5 | 60 | 6.3 |
| 21 | *** | 22.2# | 18.1 | 15.8# | 15.1 | 83 | 0.5 | 70 | 4.7 |
| 22 | *** | 23.0# | 19.4 | 17.0# | 16.8 | 85 | 0 | 190 | 3.2 |
| 23 | *** | 20.3# | 18.6 | 16.5# | 16.1 | 86 | 0 | 10 | 4.9 |
| 24 | *** | 23.4 | 19.3 | 16.4 | 15.6 | 80 | 0 | 60 | 5.2 |
| 25 | *** | 22.0# | 18.8 | 16.2# | 17.7 | 94 | 0 | 20 | 5.4 |
| 26 | *** | 26.8# | 20.4 | 16.4# | 16.5# | 96# | 0 | 50 | 6 |
| 27 | *** | 21.5# | 17.1 | 14.1# | *** | *** | 0 | 60 | 8.2 |
| 28 | *** | 20.6# | 17.4 | 15.4# | *** | *** | 0 | 70 | 6.9 |
| 29 | *** | 18.9# | 17.9 | 16.8# | *** | *** | 11 | 20 | 5.1 |
| 30 | *** | 22 | 19.5 | 18.1 | 17.8# | 87# | 1.5 | 360 | 5 |
| 31 | *** | 19.3 | 18.4 | 17.3 | 15.6 | 84 | 0 | 60 | 6.7 |

*** unavailable
# data incomplete
Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Daily Extract of Meteorological Observations , January 2020 - Tseung Kwan O

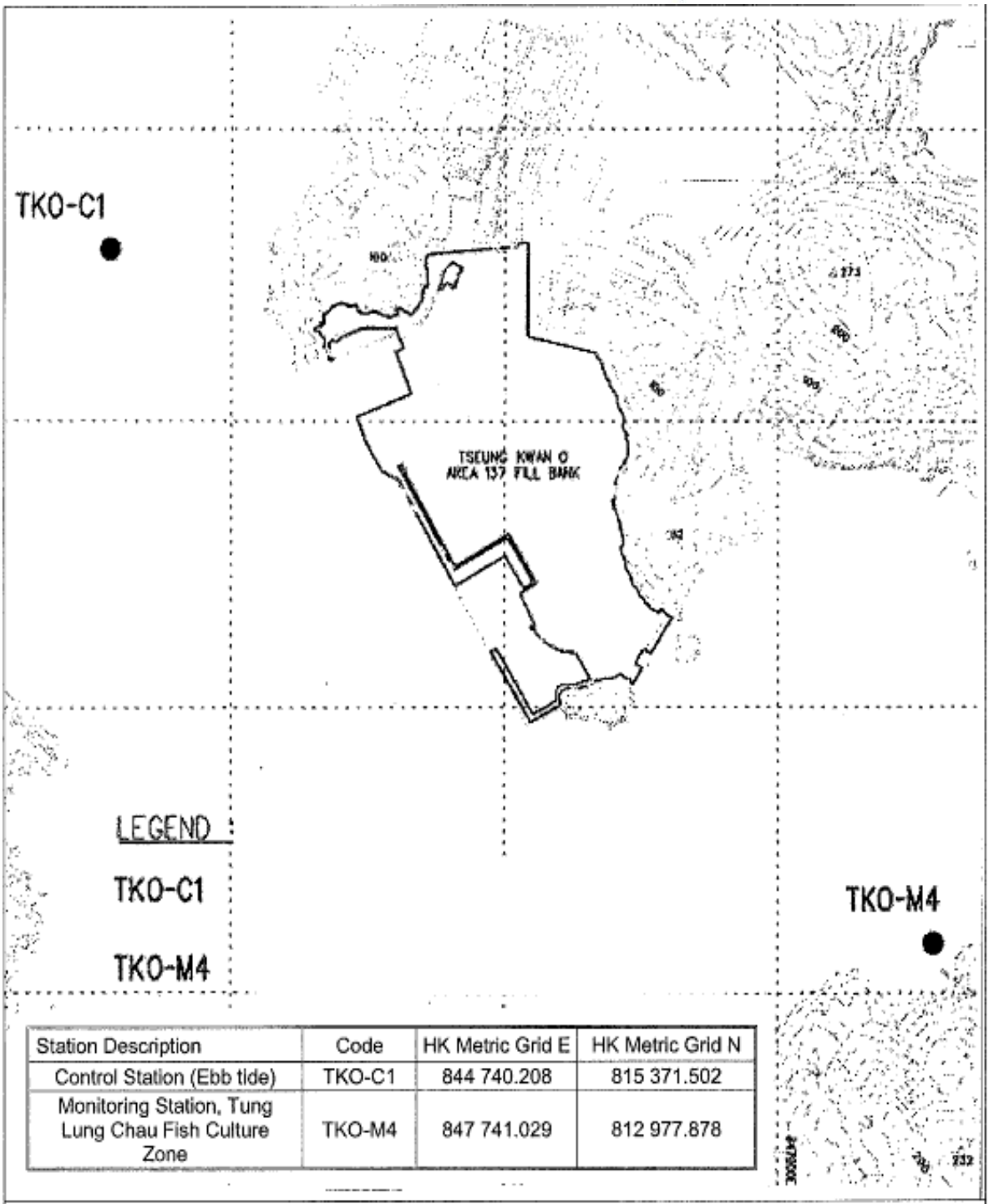
| Day | Mean Pressure (hPa) | Air Temperature | | | Mean Dew Point (deg. C) | Mean Relative Humidity (%) | Total Rainfall (mm) | Prevailing Wind Direction (degrees) | Mean Wind Speed (km/h) |
|---|---|---|---|---|---|---|---|---|---|
| | | Absolute Daily Max (deg. C) | Mean (deg.C) | Absolute Daily Min (deg. C) | | | | | |
| 1 | *** | 19.1 | 17.2 | 16.5 | 12.9 | 76 | 0 | 70 | 6 |
| 2 | *** | 21.3 | 17.3 | 14.4 | 13.1 | 77 | 0 | 70 | 5.5 |
| 3 | *** | 22.3 | 17.7 | 14.4 | 14.3 | 82 | 0 | 50 | 4.7 |
| 4 | *** | 22.1 | 17.7 | 14.2 | 14.7 | 83 | 0 | 60 | 4.4 |
| 5 | *** | 22.9 | 19.5 | 18.1 | 15.1 | 76 | 0 | 40 | 8.8 |
| 6 | *** | 24.6 | 20.4 | 18.7 | 16 | 76 | 0 | 60 | 6.8 |
| 7 | *** | 25.7 | 21.1 | 18.4 | 17.9 | 83 | 0 | 80 | 2.3 |
| 8 | *** | 27.1# | 20.8 | 17.9# | 14.9 | 71 | 0 | 60 | 5.9 |
| 9 | *** | 19.1 | 18.4 | 17.7 | 13.9 | 75 | 0 | 30 | 7.8 |
| 10 | *** | 21.7 | 18.9 | 17 | 15.3 | 80 | 0 | 20 | 7.4 |
| 11 | *** | 24.0# | 20.1 | 17.1# | 16.4 | 80 | 0 | 020# | 4.0# |
| 12 | *** | 21.4 | 17.1 | 14.2 | 9.4 | 62 | 0 | 60 | 7.5 |
| 13 | *** | 18.3 | 17.1 | 16.1 | 12.4 | 74 | 0 | 10 | 6.3 |
| 14 | *** | 22.1 | 18 | 15.5 | 13 | 73 | 0 | 20 | 6.4 |
| 15 | *** | 20.6 | 18.8 | 17.4 | 14.7 | 77 | 0 | 60 | 8 |
| 16 | *** | 20.6 | 18.5 | 16.9 | 15.7 | 83 | 0 | 10 | 5.8 |
| 17 | *** | 19.4 | 17.5 | 15.7 | 10.9 | 66 | 0 | 60 | 6.3 |
| 18 | *** | 20.3# | 16.9 | 14.1# | 11.5 | 71 | 0 | 010# | 5.9# |
| 19 | *** | 20.6# | 17.5 | 14.8# | 12.1 | 71 | 0 | 70 | 7.8 |
| 20 | *** | 19.9# | 16.3 | 13.3# | 12 | 76 | 0 | 70 | 3.5 |
| 21 | *** | 20.7 | 17.6 | 15 | 13.7 | 78 | 0 | 20 | 7.3 |
| 22 | *** | 23.2# | 19.7 | 17.0# | 16 | 80 | 0 | 20 | 4.3 |
| 23 | *** | 25.6# | 21.1 | 19.4# | 18.5 | 85 | 0.5 | 60 | 3.8 |
| 24 | *** | 20.9# | 20.1 | 18.8# | 18.4 | 90 | 0 | 60 | 5.5 |
| 25 | *** | 21.7# | 18.8 | 17.6# | 16.6 | 88 | 2.5 | 20 | 7.5 |
| 26 | *** | 19.3# | 15.6 | 12.6# | 12.4 | 82 | 16 | 340 | 7.4 |
| 27 | *** | 16.9# | 12.1 | 9.7# | 6.1 | 67 | 0 | 330 | 7.7 |
| 28 | *** | 16.3 | 12 | 9.3 | 5.2 | 63 | 0.5 | 350 | 6.7 |
| 29 | *** | 17.2# | 12.7 | 9.7# | 2.3 | 49 | 0 | 60 | 8.3 |
| 30 | *** | 19.1# | 13.4 | 9.5# | -0.6 | 39 | 0 | 50 | 7.4 |
| 31 | *** | 18.1# | 13.3 | 9.5# | 2.4 | 50 | 0 | 70 | 4.5 |

*** unavailable

# data incomplete

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

# Figures



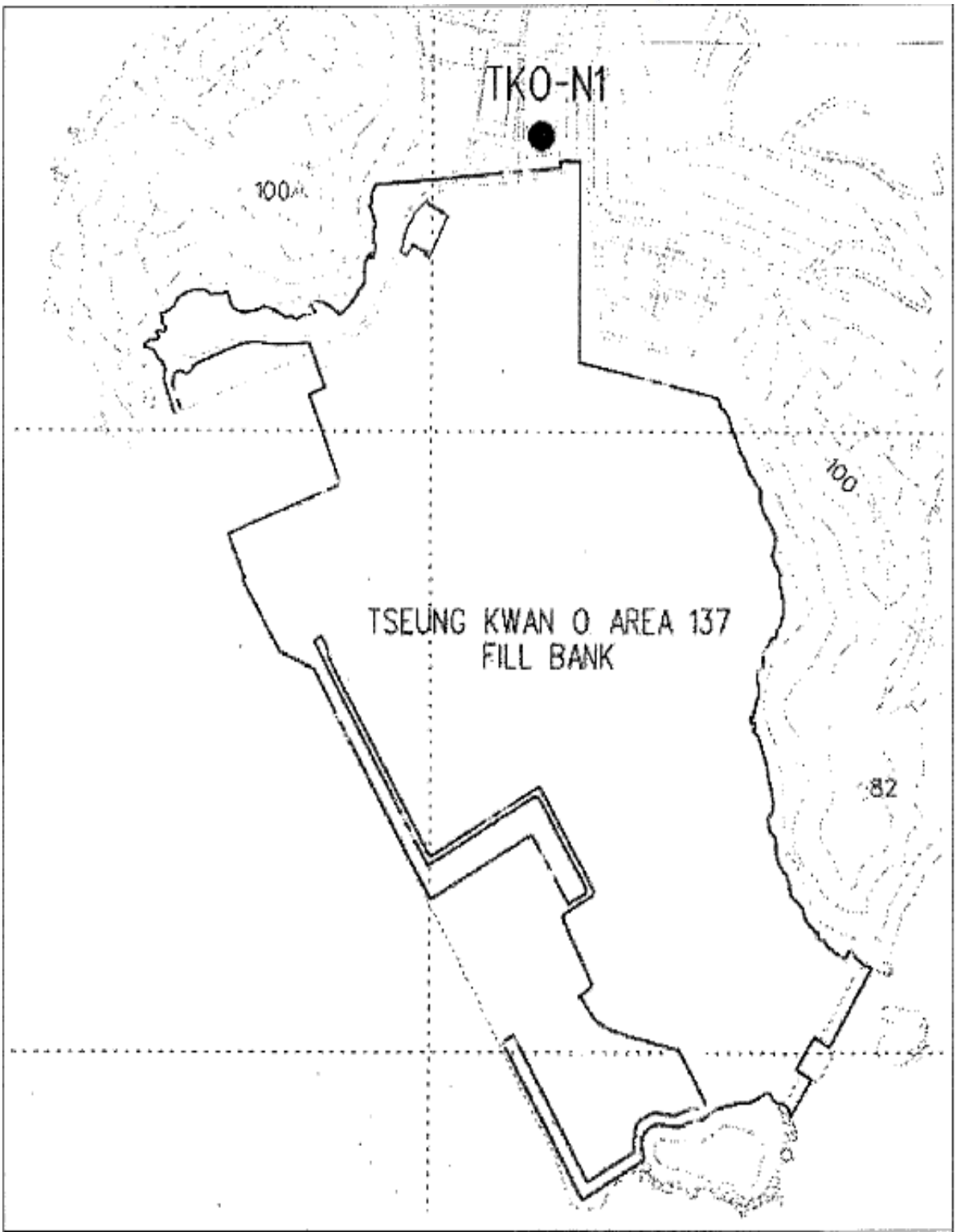

| Station Description | Code | HK Metric Grid E | HK Metric Grid N |
|---|---|---|---|
| Control Station (Ebb tide) | TKO-C1 | 844 740.208 | 815 371.502 |
| Monitoring Station, Tung Lung Chau Fish Culture Zone | TKO-M4 | 847 741.029 | 812 977.878 |

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

Figure 1

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

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

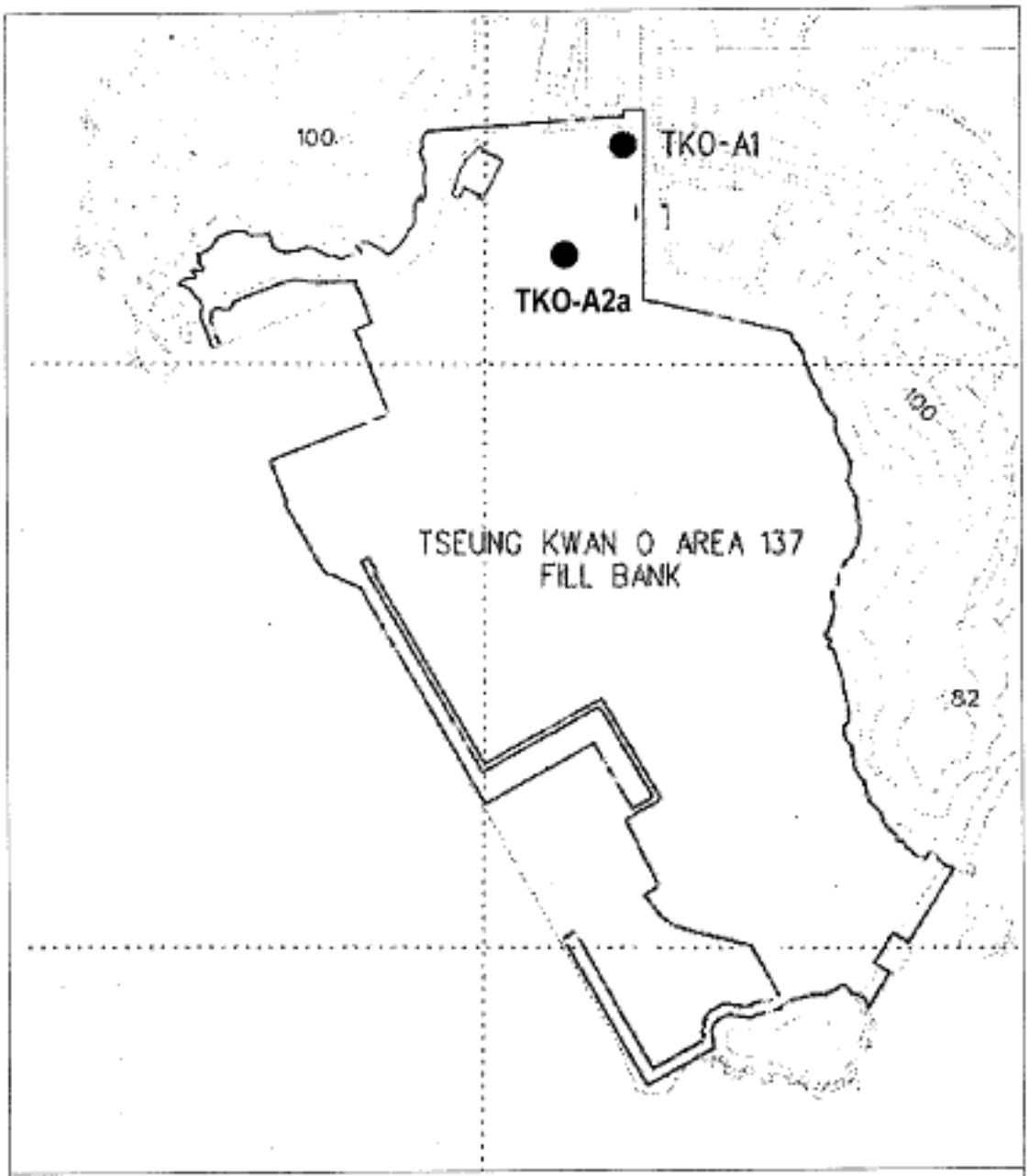



Contract No. CV/2015/07
Handling of Surplus Public Fill (2016-2018)

Figure 2

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

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

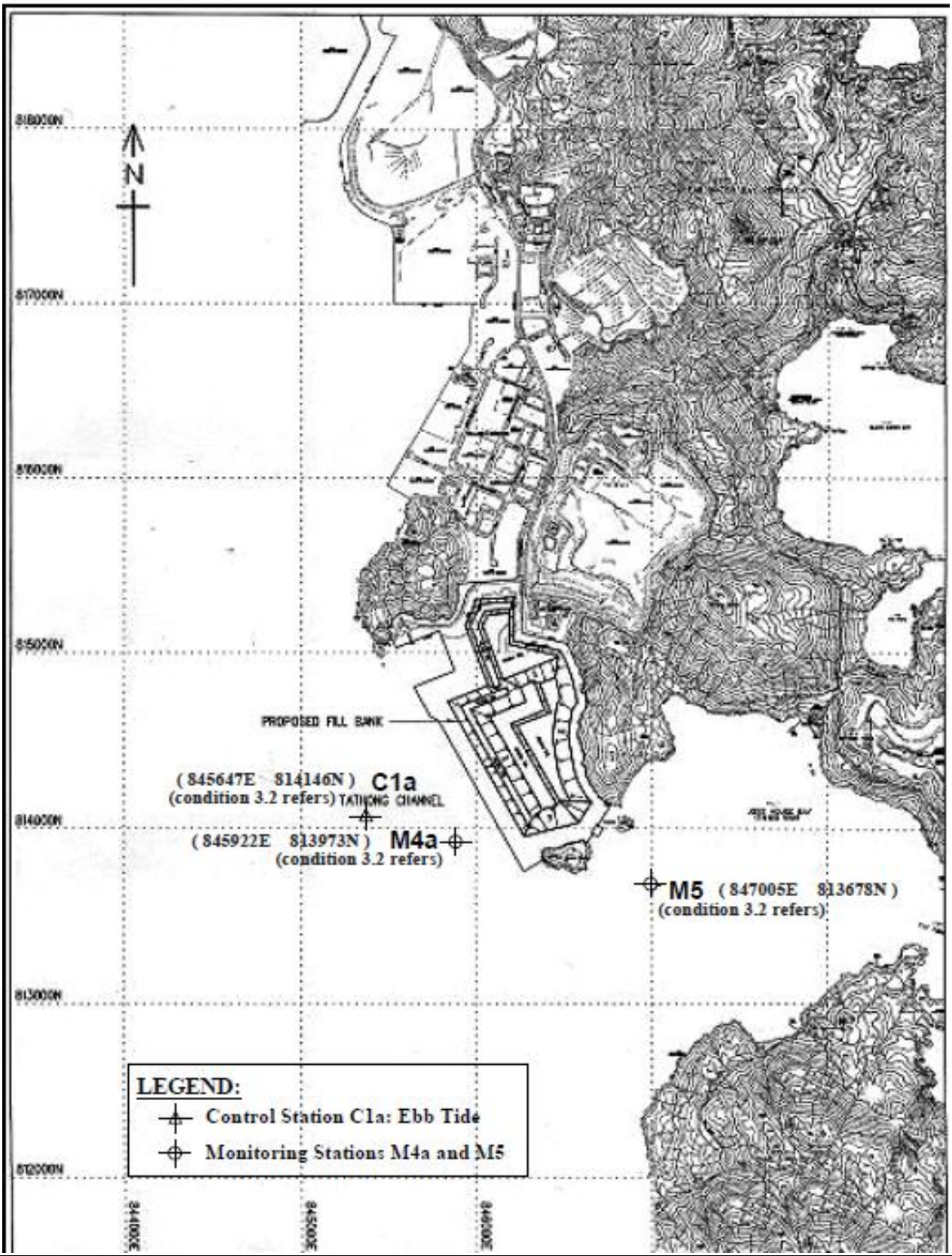



Contract No. CV/2015/07
Handling of Surplus Public Fill (2016-2018)

Figure 3

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

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED




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

Figure 4
Locations of Additional Water Quality Monitoring Stations (3RS project)
Tseung Kwan O Area 137 Fill Bank

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED