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**TEST REPORT**

***China Harbour – China State Joint Venture***

**CONTRACT NO. CV/2009/02**

**HANDLING OF SURPLUS PUBLIC FILL**

**TSEUNG KWAN O AREA 137 FILL BANK**

**QUARTERLY EM&A SUMMARY REPORT  
NO.10**

**(FROM MARCH TO MAY 2012)**

Prepared by:

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Senior Environmental Officer

Checked by:

LAU, Chi Leung  
Environmental Team Leader

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20 June 2012

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

By E-mail and Fax No.: 2695 3944

Attention: Mr. C. L. Lau

Dear Mr. Lau,

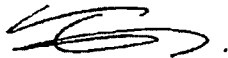
**Re: Contract No. CV/2009/02  
Handling of Surplus Public Fill – Tseung Kwan O Area 137 Fill Bank  
Quarterly EM&A Summary Report No. 10 (March to May 2012)**

Reference is made to your submission of the draft Quarterly EM&A Summary Report (March to May 2012) for the captioned by E-mail on 19 June 2012.

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

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

Yours faithfully,



Tony Cheng  
Independent Environmental Checker

c.c. CEDD  
CHCSJV

Attn: Mr. Vincent Chu  
Attn: Mr. Dennis Tang

Fax No.: 2714 0113  
Fax No.: 2247 4108

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## **EXECUTIVE SUMMARY**

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

This report documents the findings of EM&A Works conducted during the operation phase of Fill Bank at Tseung Kwan O Area 137 from March to May 2012.

### **Site Activities**

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

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

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 at PBR2 Project and dumping activities at the SENT Landfill.

The desilting facilities were in proper operation to avoid silty 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**

Marine water quality monitoring was conducted in accordance with the EM&A Manual.

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

#### **Landscape and Visual**

Erection of hoarding and chain link fencing was provided at the Fill Bank site boundary. The germination rate on the panel was satisfactory in this reporting quarter.

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

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



## 1.0 INTRODUCTION

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

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

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

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

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

Baseline monitoring was completed in August and September 2002 by 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 March to May 2012.

## 2.0 PROJECT INFORMATION

### 2.1 Scope of the Project

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

- *Site clearance;*
- *Construction of a temporary storm water system;*
- *Stockpiling of 6 million m<sup>3</sup> of public fill;*
- *Setting up two barging points: one at the Tseung Kwan O Basin (TKO Basin) and one at the Construction and Demolition Material Sorting Facility (C&DMSF) for transporting the stockpiled public fill by barges;*
- *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 Project Activities

Details of project activities in this quarter are shown in Appendix G.

## 2.4 Project Organization and Management Structure

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

## 2.5 Contact Details of Key Personnel

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

Table 2.1 Contact Details of Key Personnel

Organization	Name of Key Staff	Project Role	Tel. No.	Fax No.
CEDD	Mr. Lawrence Ng, Mr. Wing Hong Kwan, Mr. Tun Hon Chu, Mr. Chi Yuen Liu	Engineer's Representative	2760 5835	2714 0113
IEC (Materialab) *	Mr Joseph Poon	IEC	2450 8238	2450 6138
IEC (ENVIRON) *	Mr Tony Cheng	IEC	3743 0722	3548 6988
Contractor (CHCSJV)	Mr. Wah Fung Lok	Contractor's Agent	9772 7055	2243 4089
ET (ETL)	Mr C. L. Lau	ET Leader	2946 7791	2695 3944

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

## 3.0 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 Appendices 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	March 2012	April 2012	May 2012
24-hr TSP	No of monitoring events	6	5	5
	Action Level	0	0	0
	Limit Level	0	0	0
1-hr TSP	No of monitoring events	15	16	15
	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 and 24-hr TSP averages at both stations in the reporting quarter were higher than the baseline levels but they were 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 ( $\mu\text{g}/\text{m}^3$ )		24-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	TKO-A1	TKO-A2	TKO-A1	TKO-A2
Baseline (29/08 – 13/09)	195		123	
March 2012	305	287	126	117
April 2012	317	292	121	101
May 2012	300	272	150	127



## 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 limited 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	March 2012	April 2012	May 2012
	Leq, dB(A)			
TKO-N1	75	68.2	68.8	69.1

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.

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 D.

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

Parameter	Exceedance Level	March 2012	April 2012	May 2012
Number of monitoring days		13	10	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 I 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 4.5.

Table 4.5 Summary of Statistically Significant Results of SS

Monitoring Station	Significant difference?	
	Mid-ebb	Mid-flood
C1	X	X
M4	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 accumulation of fill materials on the concrete pavement at the BHA in the reporting quarter, the Contractor was reminded to clean up the fill materials as soon as each unloading activity completed to avoid the fill materials from being washed into the sea. Furthermore, the Contractor should also regularly inspect and maintain the oil interceptor at the car park to ensure it properly functions.

Although there were a few observations regarding improper handling of oil drums and chemical containers, such as lack of drip tray and accumulated of stagnant water in the drip tray, the Contractor rectified most of these problems. Besides, the Contractor should provide tarpaulin sheets before repairing and maintenance works and also carry out proper cleaning activities immediately after such works.

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 Period		Section
		From	To	
Amended Environmental Permit	EP-134/2002/J	14/11/11	---	<ul style="list-style-type: none"> <li>▪ Site clearance</li> <li>▪ Construction of a temporary storm water system</li> <li>▪ Stockpiling of 6 million m<sup>3</sup> of public fill</li> <li>▪ Setting up two barging points for transporting the stockpiled public fill by barges</li> <li>▪ Setting up a temporary barging point at the existing Explosive Off-loading Barging Point for the period of May 2004 to December 2004 for transporting the stockpiled public fill by barge</li> <li>▪ Construction of operation of a construction and Demolition Material Sorting Facility (C&amp;DMSF)</li> <li>▪ Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin</li> <li>▪ Remove the temporary fill bank</li> </ul>
Chemical Waste Producer	5123-839-C3577-02	17/12/09	---	Spent Lubricating Oil, Spent Flammable Liquid, Spent Battery Containing Heavy Metals and Surplus Paint
Effluent Discharge License	WT00005777-2010	12/05/10	31/05/15	Wastewater arising from the wheel washing bay, Sedimentation Tank & Desilting Tank
Marine Dumping Permit	EP/MD/12-103	01/01/12	31/03/12	Approval for dumping 3,200,000 tons (approximately equal to 1,777,777 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank, Barging Point at Former Kai Tak Airport and MTR XRL Contracts 803A to D to designated dumping area at Guanghaiwan of Taishan
Marine Dumping Permit	EP/MD/12-137	01/04/12	30/06/12	Approval for dumping 3,200,000 tons (approximately equal to 1,777,777 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank, Barging Point at Former Kai Tak Airport and MTR XRL Contracts 803A to D to designated dumping area at Guanghaiwan of Taishan

### 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	Examples	March 2012	April 2012	May 2012
C&D Waste	Domestic waste (site) collected in garbage bins and general refuse	0	0	0
Chemical Waste	Waste oil (L) / Chemical Waste (kg)	0	0	0
Recycle Material	Metal scraps	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 Level of marine water quality, 1-hour and 24-hour monitoring results was recorded. 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 on marine water quality, 1-hour, 24-hour TSP and noise monitoring parameters 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 on marine water quality, 1-hour, 24-hour TSP and noise monitoring parameters recorded in this quarter, no further action was required.

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

No complaint, notification of summon and successful prosecution was received. A summary of environmental complaints and prosecutions was given in Table 6.1.

Table 6.1 Summary of Environmental Complaints and Prosecutions

<i>Period</i>	<i>Complaints logged</i>	<i>Summon served</i>	<i>Successful Prosecution</i>
<i>March 2011</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>April 2012</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>May 2012</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Cumulative</i>	<i>5</i>	<i>0</i>	<i>0</i>

## 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 and marine water quality monitoring was recorded in this reporting quarter.

No complaint, notification of summons and successful prosecution with respect to environmental issues 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;
- Conduct road sweeping on the public road and the main haul roads outside and near the site egress by the road sweeper.
- Undertake water spraying on stockpiling area;
- 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;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the construction activities; and
- Ensure all vehicles to be washed before leaving the site egress through the 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 trapezoidal channels and permanent desilting chambers regularly;
- Operate and maintain the silt curtains regularly;
- Check and maintain the silt curtain regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- Clean up the fill material on the concrete pavement at BHA frequently; and
- Remove the stagnant water or provide pesticide 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.

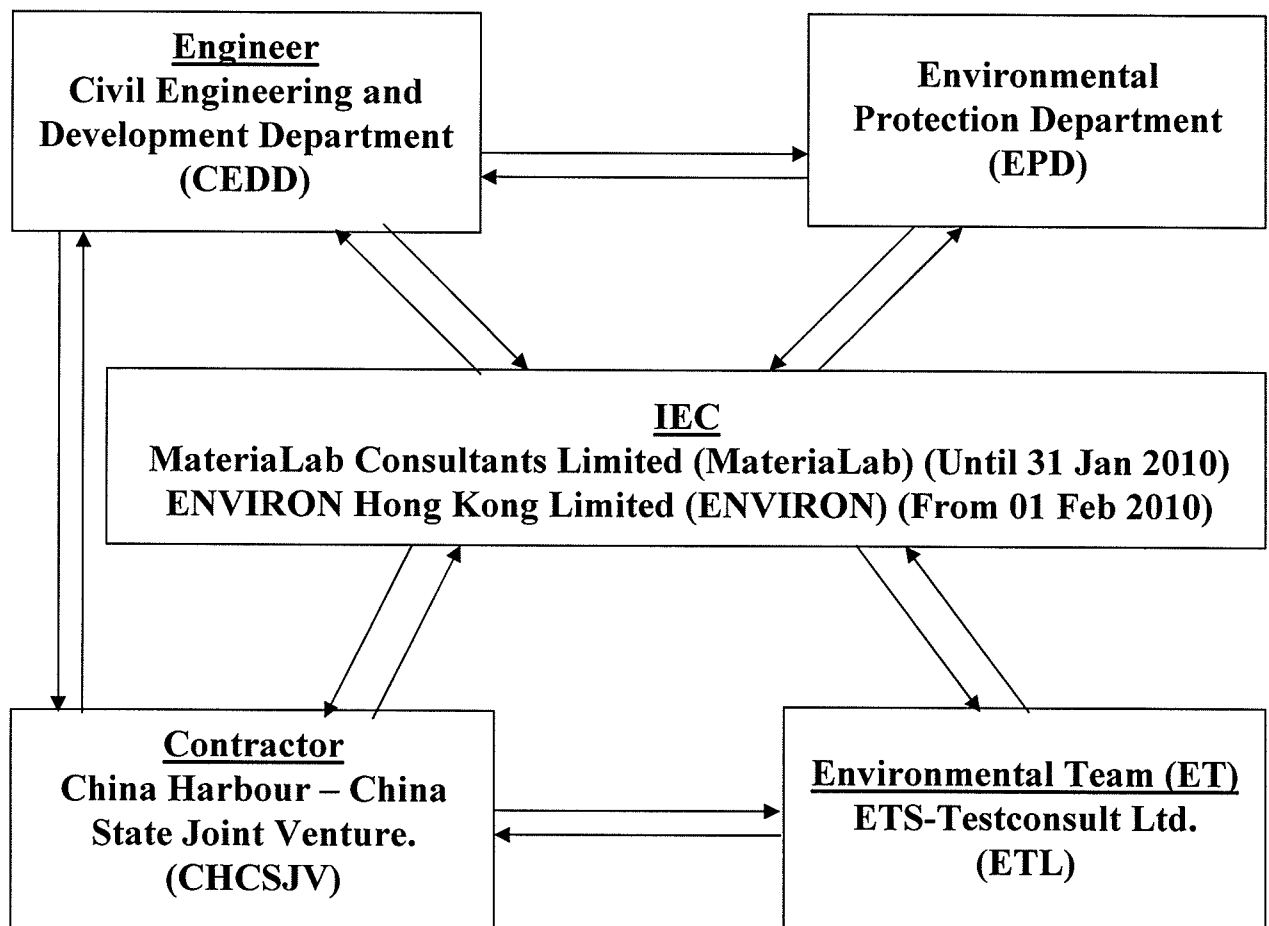
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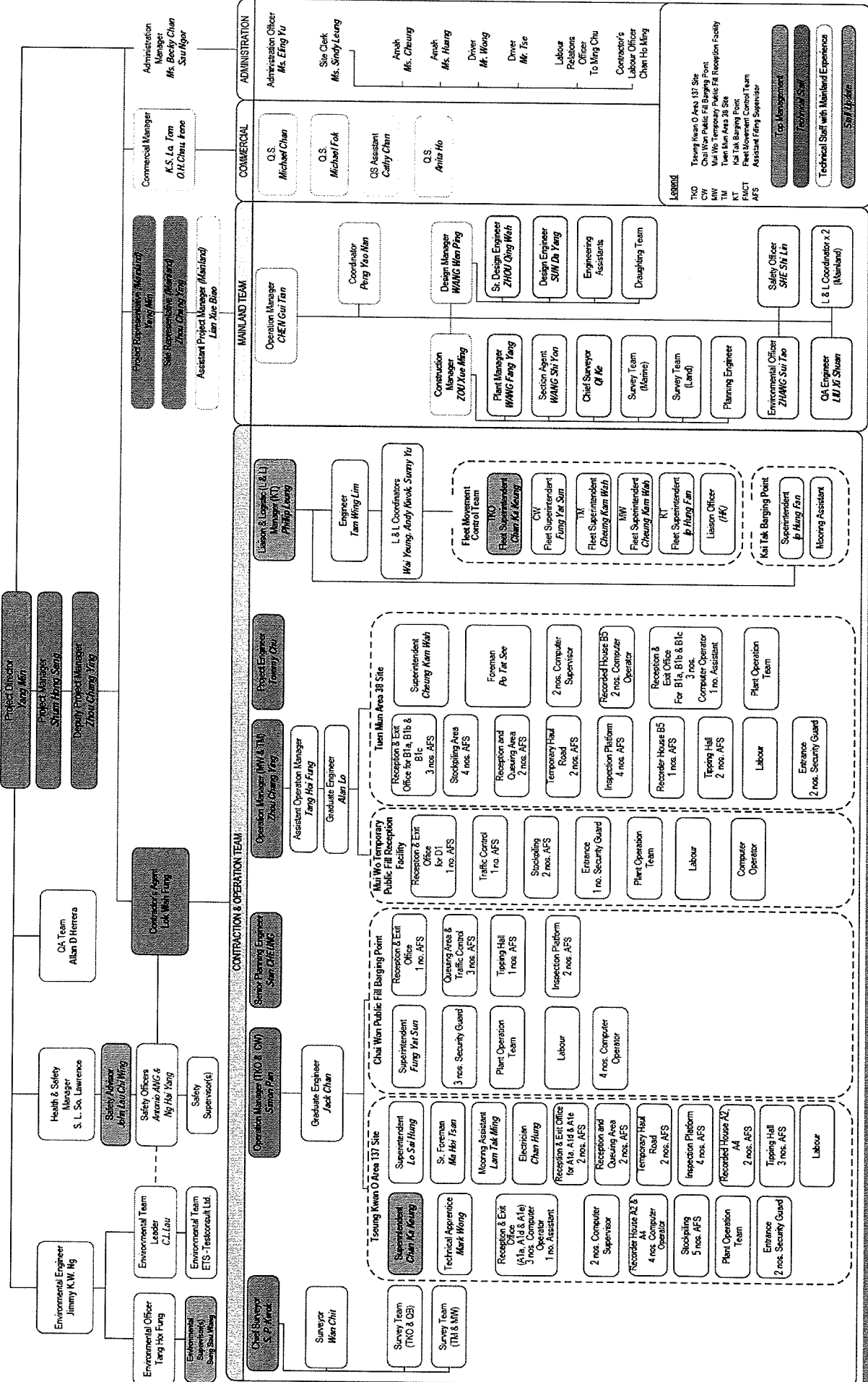
## Appendix A

### Organization Chart and Lines of Communication

# Lines of Communication



**JOINT VENTURE MANAGEMENT BOARD**  
**CHEN Feri Jan, WANG Ian, PAN Siu Ho, George CHAN**



**Legend**  
 TWQ Tsing Kwan O Area 137 Site  
 CW Chai Wan Public Fill Barging Point  
 MW Mei Wo Temporary Public Fill Reception Facility  
 TM Tuen Mun Area 38 Site  
 KT Kai Tak Barging Point  
 FNCT Fleet Movement Control Team  
 AFS Assistant Filing Supervisor

**Top Management**  
 Senior Staff  
 Technical Staff with Mainland Experience  
 Staff

**Organisation Chart (Rev.8)**  
 Contract No. CV/2009/02  
 Handling of Surplus Public Fill  
 (Revised on 1 March 2012)

**CEDD**  
 Civil Engineering and  
 Development Department

**HEC**  
**CHINA STATE**  
 China Harbour - China State Joint Venture



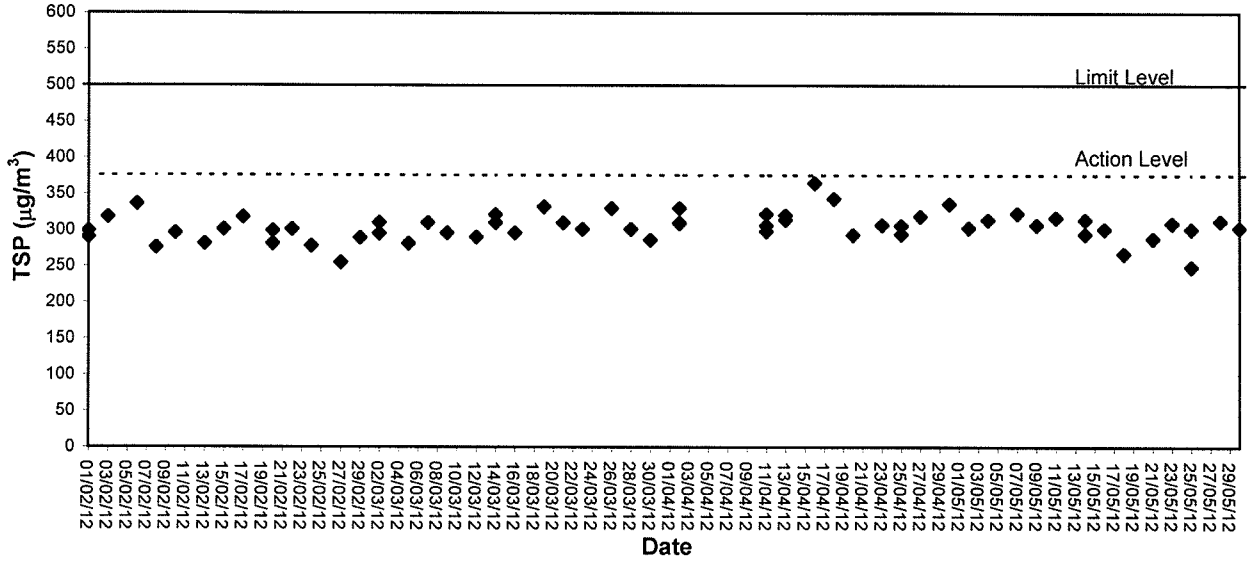


## **Appendix B**

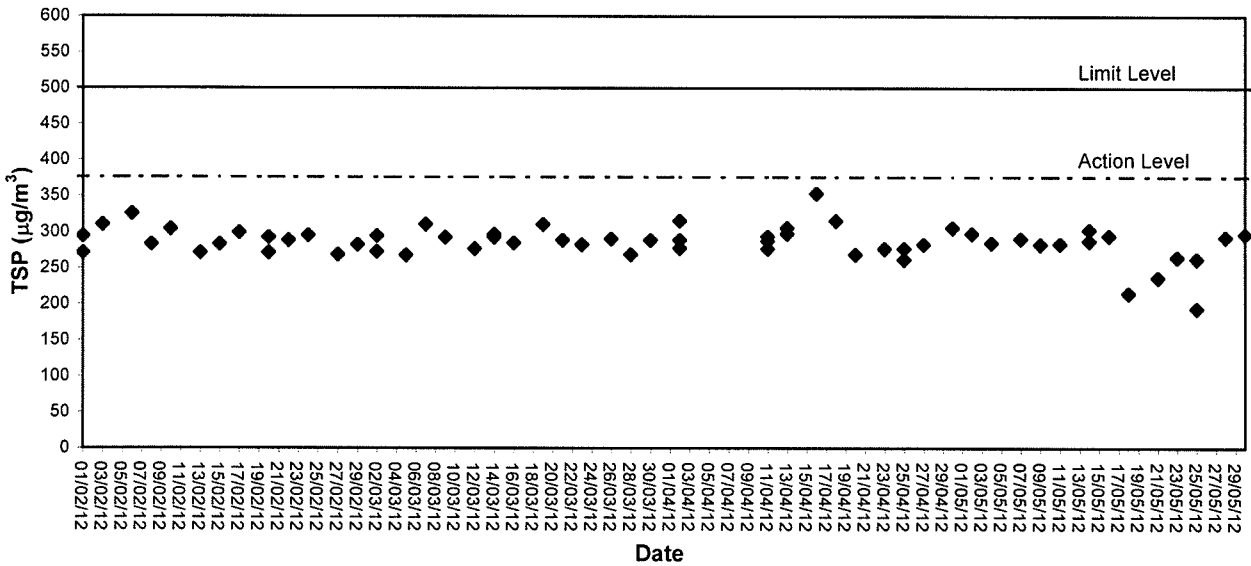
### **Graphical Plots of Air Quality Monitoring Data**



1-hour TSP level at TKO-A1

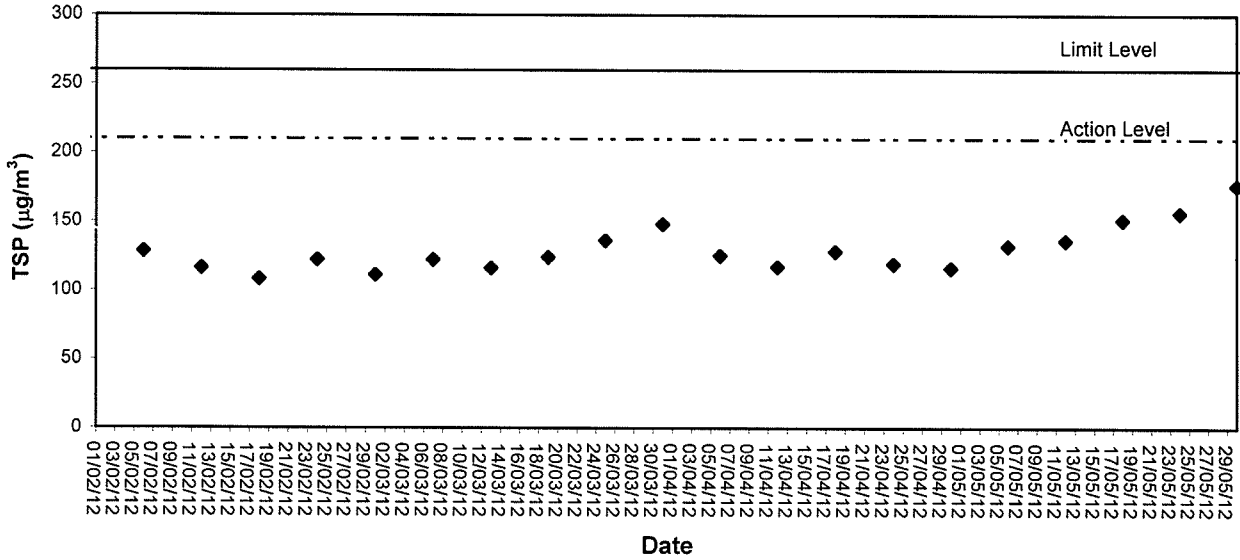


1-hour TSP level at TKO-A2a

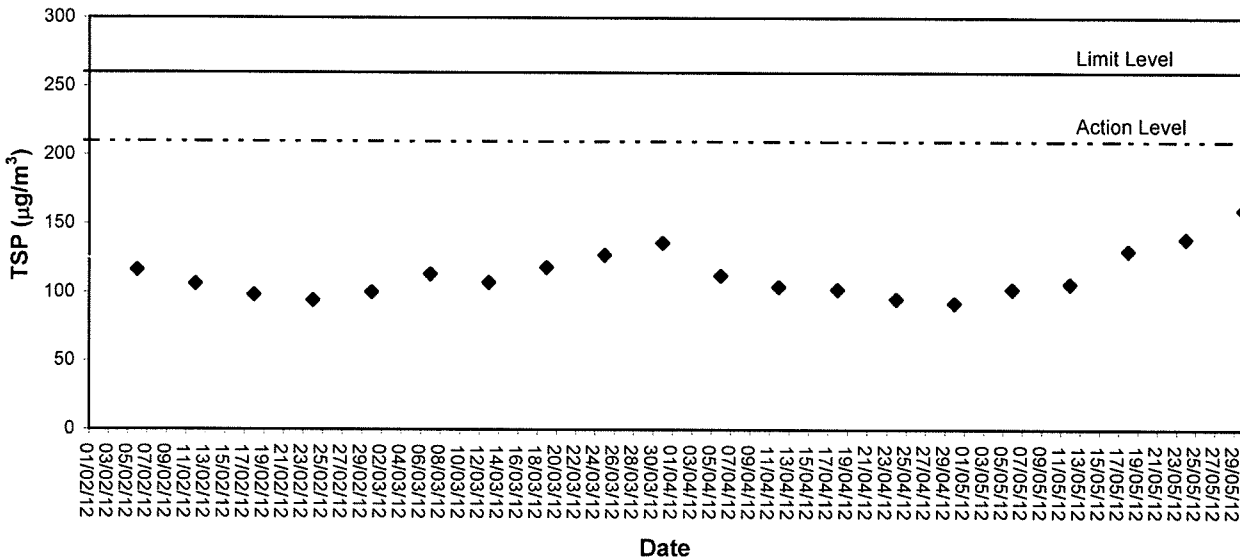




### 24-hour TSP level at TKO-A1



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



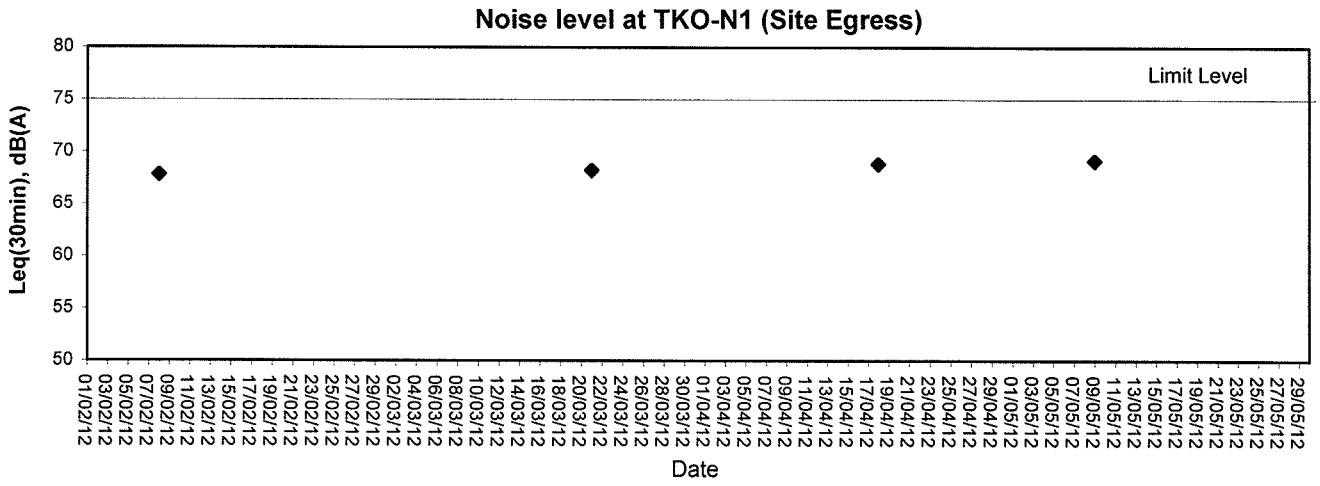


## Appendix C

### Graphical Plots of Noise Monitoring Data



## Noise Monitoring (Day-time)



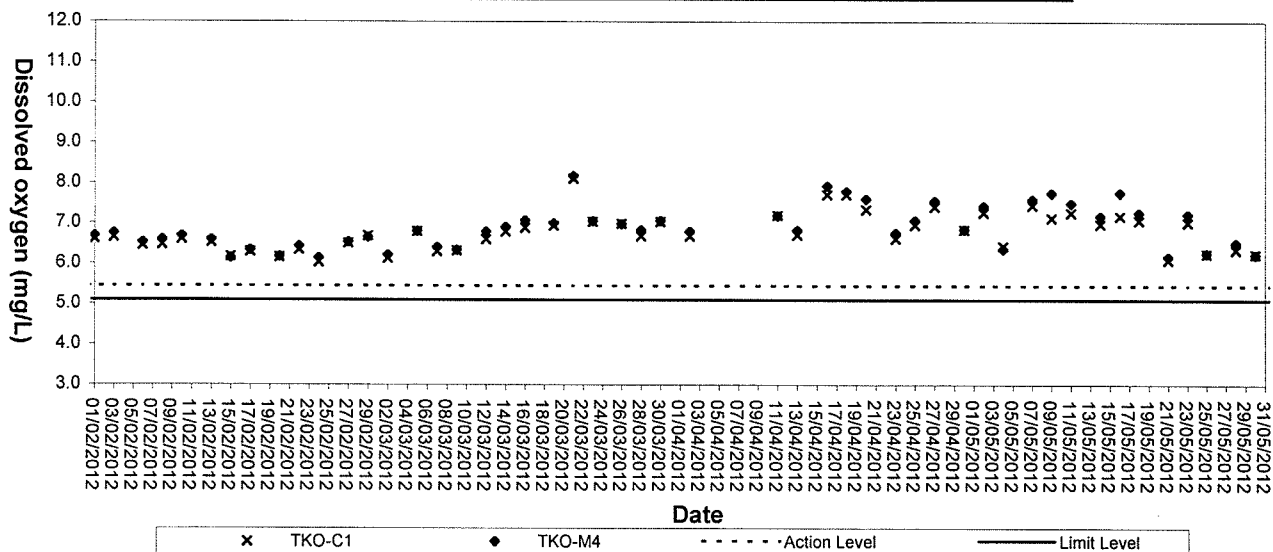


## **Appendix D**

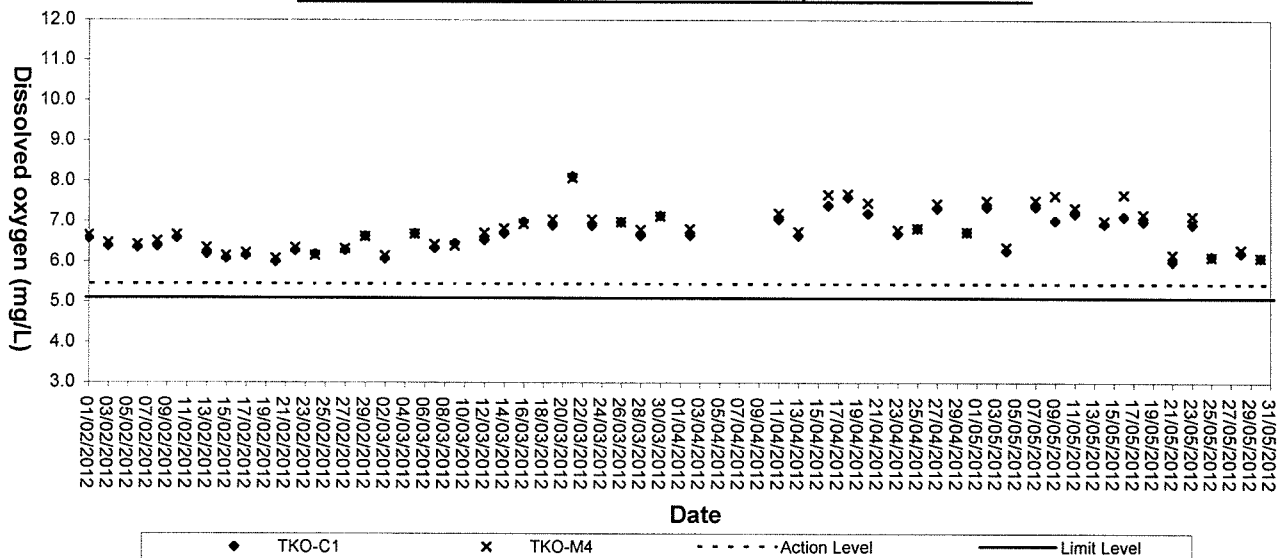
### **Graphical Plots of Impact Marine Water Quality Monitoring Data**



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

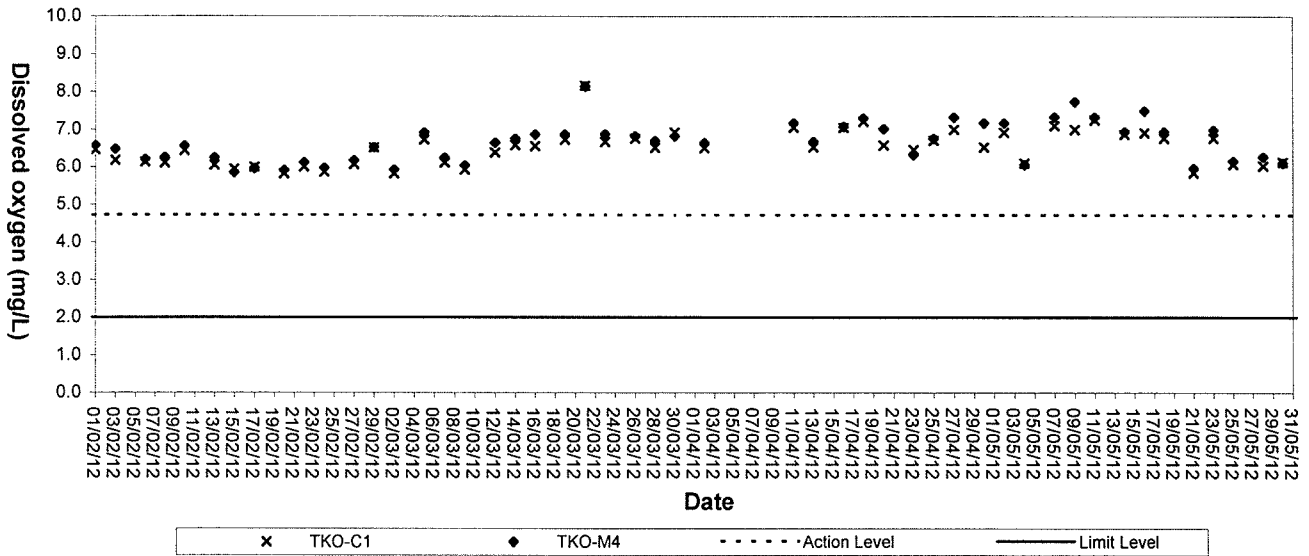


### Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

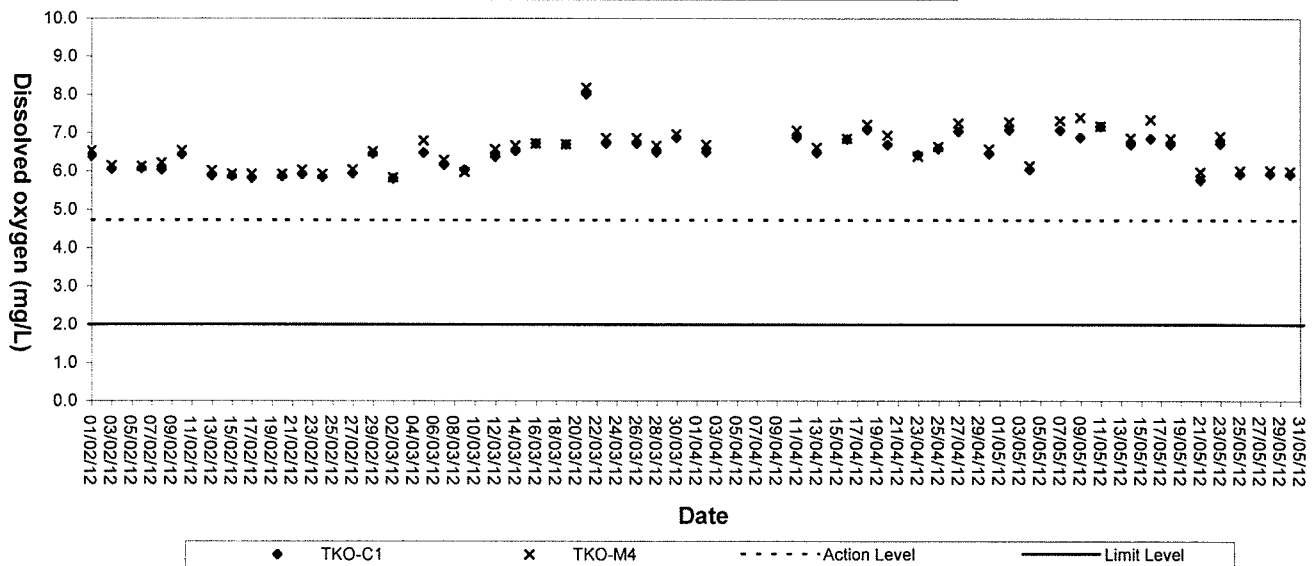




### Dissolved Oxygen (Bottom) at Mid-Flood Tide



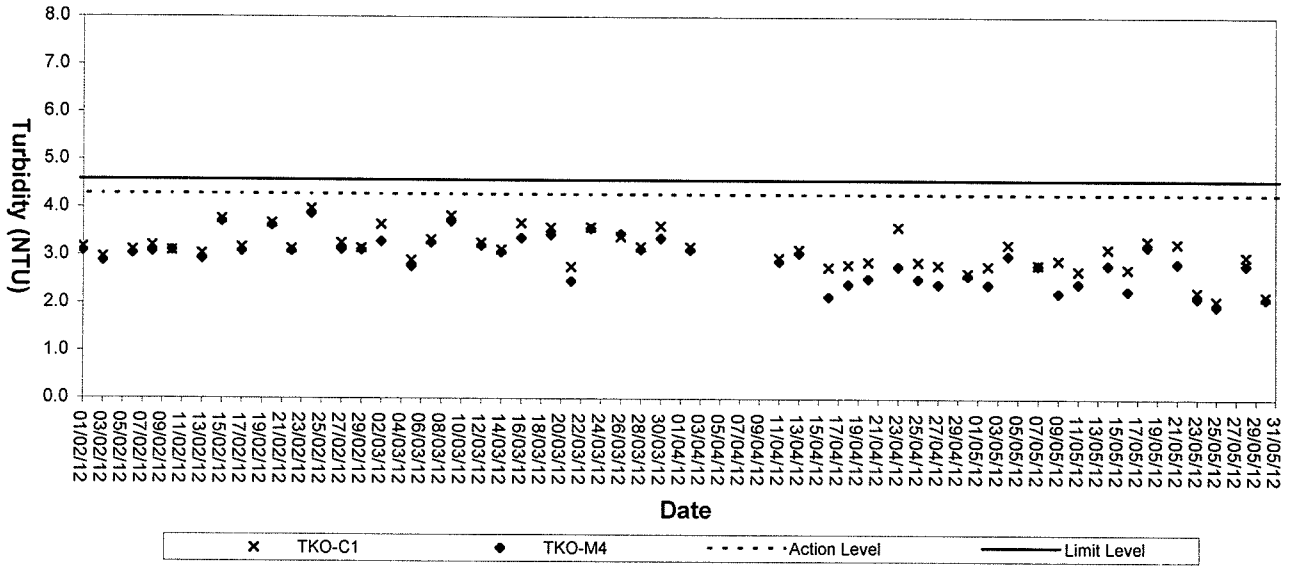
### Dissolved Oxygen (Bottom) at Mid-Ebb Tide



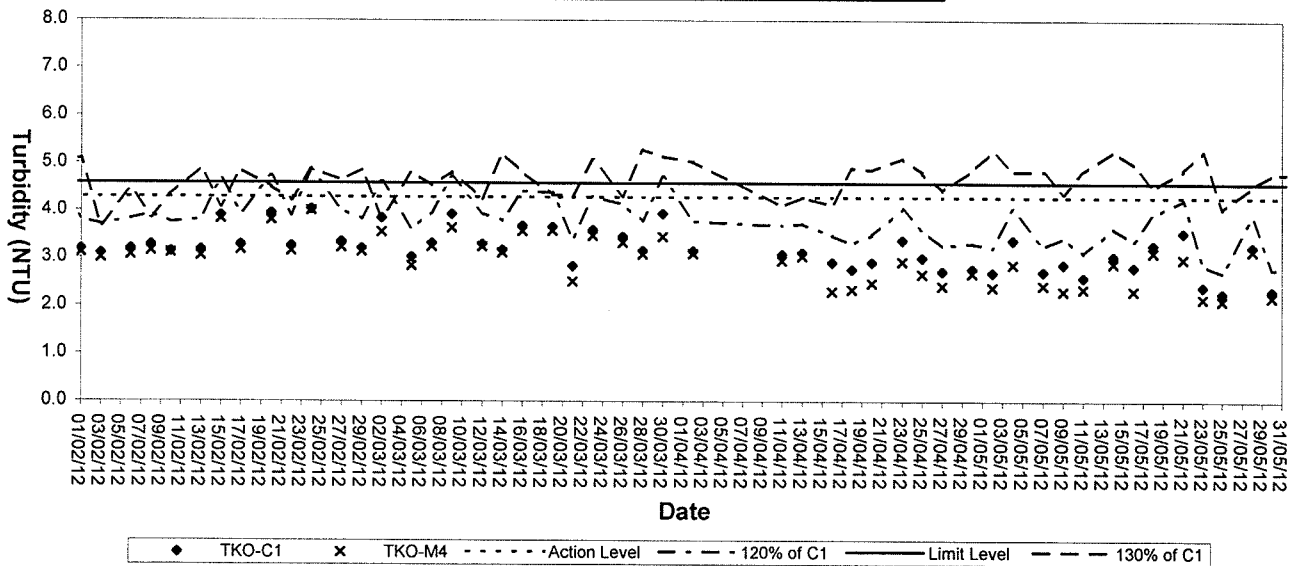




### Turbidity (Depth-average) at Mid-Flood Tide

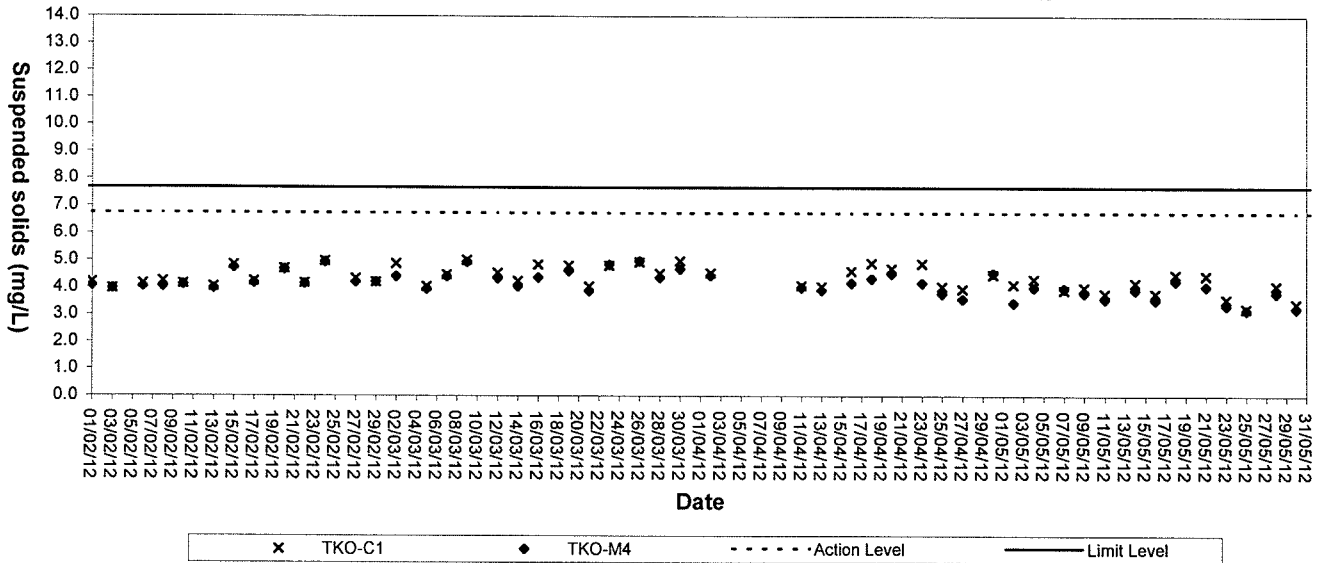


### Turbidity (Depth-average) at Mid-Ebb Tide

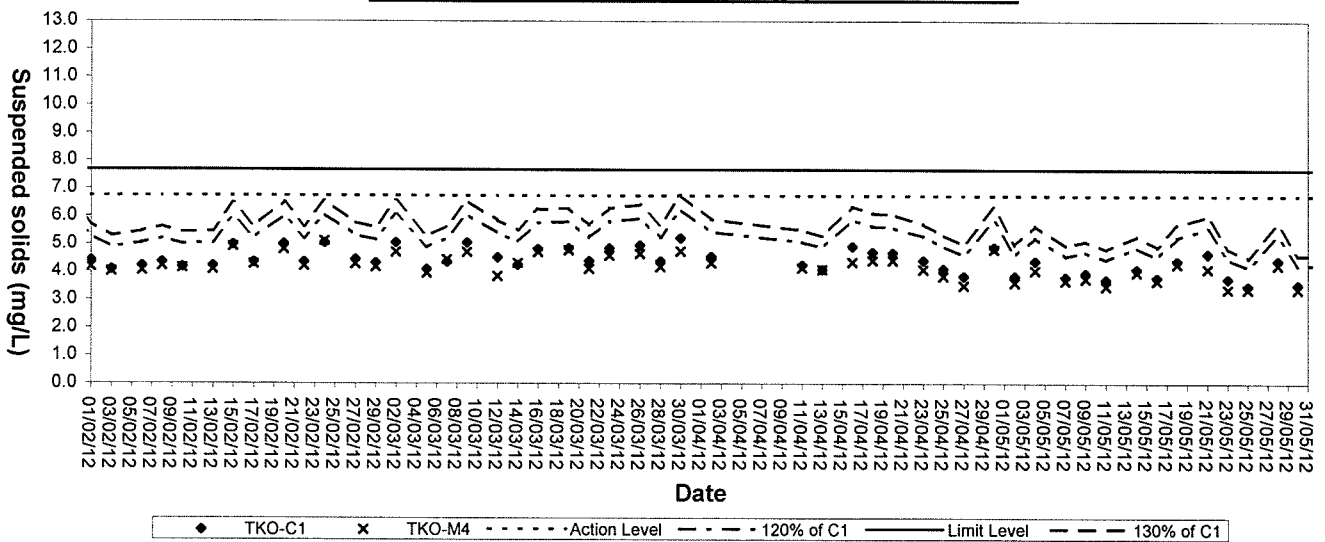




### Suspended solids (Depth-average) at Mid-Flood Tide



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





## **Appendix E**

### **Environmental Quality Performance (Action / Limit Levels)**

**Action and Limit Levels for Air Quality**

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

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	376	500
A2		

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

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
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)	<u>Surface &amp; Middle</u> DO < 5.45 (5%-ile of baseline data) <u>Bottom</u> DO < 4.72 (5%-ile of baseline data)	<u>Surface &amp; Middle</u> DO < 5.10 (1%-ile of baseline data) <u>Bottom</u> 2 mg/L
Suspended solids, SS mg/L (Depth-averaged)	SS > 6.74 (95%-ile of baseline data or SS > 120% of upstream control stations SS at the same tide of the same day)	SS > 7.67 (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 (95%-ile of baseline data or Tby > 120% of upstream control stations Tby at the same tide of the same day)	Tby > 4.58 (99%-ile of baseline data or Tby > 130% of upstream control stations Tby at the same tide of the same day)

## **Appendix F**

### **Event-Action Plans**

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

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

## EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

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

## EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

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



## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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

## EVENT AND ACTION PLAN FOR WATER QUALITY

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

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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

## EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

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



## **Appendix G**

### **Project Activities**

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

Site Location : Tseung Kwan O Area 137 Fill Bank

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

## **Appendix H**

### **Implementation Schedule of Environmental Mitigation Measures (EMIS)**



## Environmental Mitigation Implementation Schedule

	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
<b>Environmental Protection Measures</b>				
<b>Air Quality</b>				
• 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.		√		
<b>Noise Impact</b>				
• 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	√		





Environmental Protection Measures	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented Not Applicable
<b>Water Quality</b>				
• Drainage system should be adequate and well maintained to prevent flooding and overflow, especially after rain storms.	All areas		√	
• Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding.	All areas		√	
• The existing / realigned intercepting channels and the sand / silt removal facilities shall be used and maintained regularly.	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.	Along the seafront	√		
• A buffer distance of at least 20m shall be maintained between the boundary of the C&DMSF and the seafront.	C&DMSF			√
• The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge.	All areas	√		
• The material shall be properly covered to prevent washed away especially before rainstorm.	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	√		
• 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	√		
• Obtain Discharge License	Site Office	√		
• Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer.	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.	Barge Handling Area (BHA)	√		
• A waste collection vessel shall be deployed to remove floating debris.	Barge Handling Area (BHA)	√		
<b>Landscape and Visual</b>				
• Construction of lighting to avoid spillage and glare	All areas	√		
• Hydroseeding	Completed slopes	√		
• Hoarding erection	Site boundary	√		
• Damage to surrounding area avoided	All areas	√		
<b>Other Environmental Factors</b>				
• 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		√	



## **Appendix I**

### **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	36	0	4.0852	0.4631	0.0772

#### Result:

Probability that two variances are equal (f-test) = 0.00007

Difference between means = 2.8838 (Std Dev = 1.1203 and SE = 0.3181)  
(95% CI : 2.2603 < Diff < 3.5073)

t-value of difference = 9.066 (12 degrees of freedom)  
P = 1 (>0.05)

#### Conclusion:

There is no statistically significant difference between the groups.

#### 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	36	0	4.3139	0.4632	0.0772

#### Result:

Probability that two variances are equal (f-test) = 0

Difference between means = 2.6551 (Std Dev = 1.0188 and SE = 0.2849)  
(95% CI : 2.0967 < Diff < 3.2135)

t-value of difference = 9.319 (12 degrees of freedom)  
P = 1 (>0.05)

#### Conclusion:

There is no statistically significant difference between the groups.

## 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	36	0	4.1176	0.4379	0.073

#### Result:

Probability that two variances are equal (f-test) = 0

Difference between means = 2.7794 (Std Dev = 1.4509 and SE = 0.4246)  
(95% CI : 1.9472 < Diff < 3.6116)

t-value of difference = 6.546 (11 degrees of freedom)  
P = 0.99999 (>0.05)

#### Conclusion:

There is no statistically significant difference between the groups.

#### 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	36	0	4.354	0.4639	0.0773

#### Result:

Probability that two variances are equal (f-test) = 0.00011

Difference between means = 2.5876 (Std Dev = 1.1 and SE = 0.3114)  
(95% CI : 1.9772 < Diff < 3.198)

t-value of difference = 8.309 (12 degrees of freedom)  
P = 1 (>0.05)

#### Conclusion:

There is no statistically significant difference between the groups.



**Appendix J**  
**Site General Layout plan**

- NOTES
1. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  2. ALL WORKS TO BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
  3. ALL WORKS TO BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
  4. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  5. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  6. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  7. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  8. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  9. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.
  10. EXISTING BOUNDARY OF THE SITE IS SHOWN BY DOTTED LINE.

LEGEND

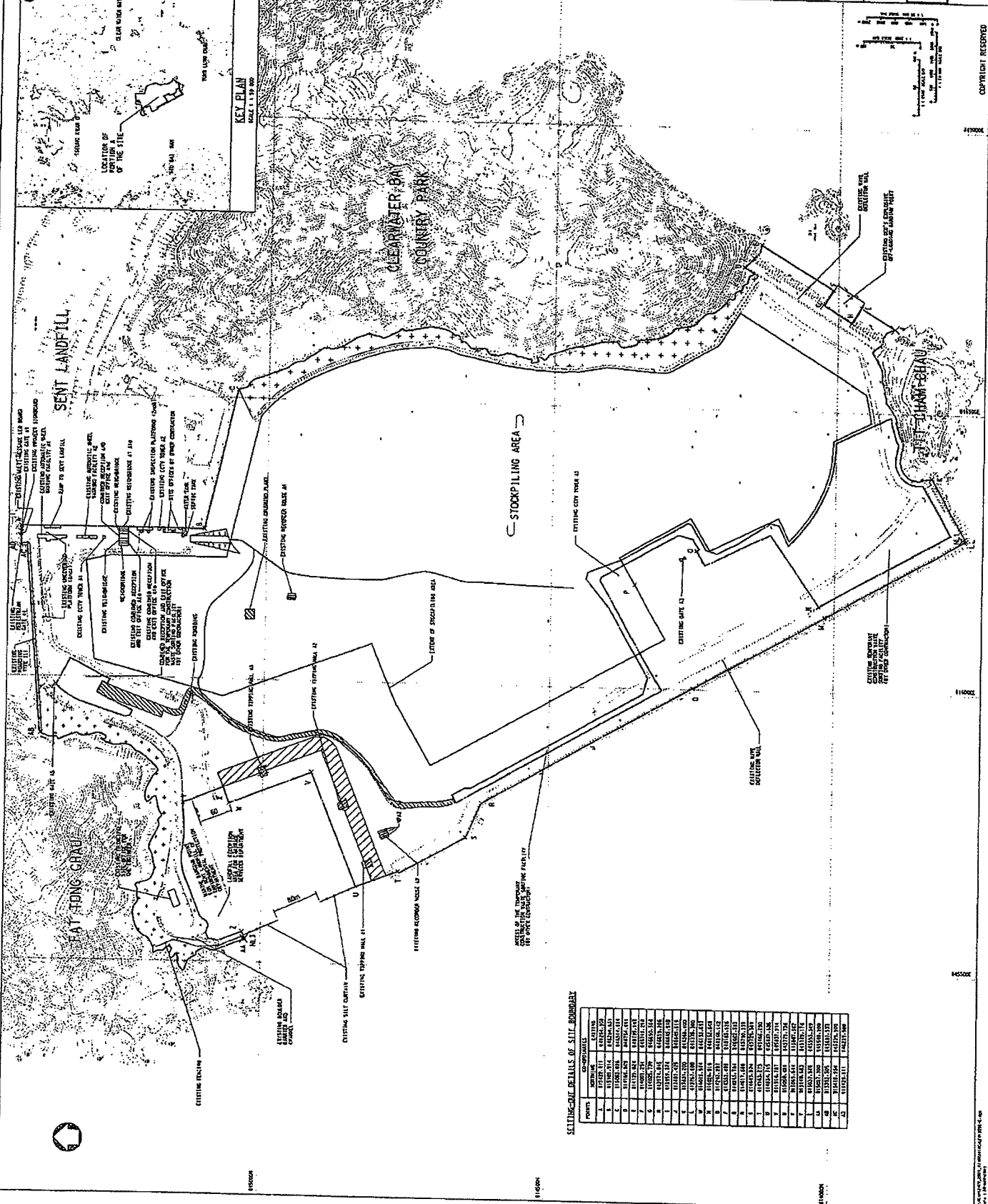
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KEY PLAN  
SCALE 1:10,000

REVISION	NO.	DATE	DESCRIPTION
1	1	10/10/2000	ISSUED FOR TENDER
2	2	10/10/2000	ISSUED FOR TENDER
3	3	10/10/2000	ISSUED FOR TENDER
4	4	10/10/2000	ISSUED FOR TENDER
5	5	10/10/2000	ISSUED FOR TENDER
6	6	10/10/2000	ISSUED FOR TENDER
7	7	10/10/2000	ISSUED FOR TENDER
8	8	10/10/2000	ISSUED FOR TENDER
9	9	10/10/2000	ISSUED FOR TENDER
10	10	10/10/2000	ISSUED FOR TENDER

PROJECT NO. FM0056-6  
 DRAWING NO. 11/200  
 DATE 10/10/2000  
 TSEUNG KWAN O AREA 137  
 FILL BANK  
 GENERAL LAYOUT OF  
 EXISTING FACILITIES

ENGINEER  
 CIVIL ENGINEERING AND  
 DEVELOPMENT DEPARTMENT



SLIDING-DOME DETAILS OF SILL BOUNDARY

NO.	DESCRIPTION	EXISTING	PROPOSED
1	EXISTING SILL	EXISTING	EXISTING
2	EXISTING SILL	EXISTING	EXISTING
3	EXISTING SILL	EXISTING	EXISTING
4	EXISTING SILL	EXISTING	EXISTING
5	EXISTING SILL	EXISTING	EXISTING
6	EXISTING SILL	EXISTING	EXISTING
7	EXISTING SILL	EXISTING	EXISTING
8	EXISTING SILL	EXISTING	EXISTING
9	EXISTING SILL	EXISTING	EXISTING
10	EXISTING SILL	EXISTING	EXISTING
11	EXISTING SILL	EXISTING	EXISTING
12	EXISTING SILL	EXISTING	EXISTING
13	EXISTING SILL	EXISTING	EXISTING
14	EXISTING SILL	EXISTING	EXISTING
15	EXISTING SILL	EXISTING	EXISTING
16	EXISTING SILL	EXISTING	EXISTING
17	EXISTING SILL	EXISTING	EXISTING
18	EXISTING SILL	EXISTING	EXISTING
19	EXISTING SILL	EXISTING	EXISTING
20	EXISTING SILL	EXISTING	EXISTING
21	EXISTING SILL	EXISTING	EXISTING
22	EXISTING SILL	EXISTING	EXISTING
23	EXISTING SILL	EXISTING	EXISTING
24	EXISTING SILL	EXISTING	EXISTING
25	EXISTING SILL	EXISTING	EXISTING
26	EXISTING SILL	EXISTING	EXISTING
27	EXISTING SILL	EXISTING	EXISTING
28	EXISTING SILL	EXISTING	EXISTING
29	EXISTING SILL	EXISTING	EXISTING
30	EXISTING SILL	EXISTING	EXISTING

419000

116000

845000

116000



## **Appendix K**

### **Weather Condition**

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

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Mar 1	*****	17.6	16.1	14.3	15.7	99	97	92
Mar 2	*****	22.6	20.0	17.5	19.2	99	95	87
Mar 3	*****	20.5	****#	15.5	****#	98	***#	96
Mar 4	*****	****	****	****	****	***	***	***
Mar 5	*****	23.8	21.5#	20.5	20.4#	99	94#	83
Mar 6	*****	24.3	22.1	19.8	21.5	100	96	88
Mar 7	*****	19.8	17.3	16.5	16.9	99	97	94
Mar 8	*****	16.7	16.0	15.4	15.6	99	97	94
Mar 9	*****	16.4	14.3	12.6	13.1	98	93	84
Mar 10	*****	15.2	13.1	11.0	9.7	90	80	68
Mar 11	*****	13.6	11.8	11.0	10.4	96	91	76
Mar 12	*****	12.8	12.0	10.8	11.2	97	95	89
Mar 13	*****	15.5	13.6	12.2	12.5	98	93	82
Mar 14	*****	17.5	15.5	13.8	13.4	95	87	74
Mar 15	*****	19.6	16.8	14.3	15.2	98	90	76
Mar 16	*****	21.1	19.2	17.5	18.6	99	96	85
Mar 17	*****	26.6	21.5	19.1	19.7	99	90	68
Mar 18	*****	28.8	22.2	18.2	19.5	99	86	60
Mar 19	*****	21.3	19.2	17.9	17.6	98	91	75
Mar 20	*****	22.0	19.2	17.7	17.4	98	89	73
Mar 21	*****	19.2	17.9	17.1	15.1	91	84	72
Mar 22	*****	22.5	19.8	16.8	16.2	95	80	68
Mar 23	*****	27.5	21.0	16.0	17.1	98	80	57
Mar 24	*****	21.7	16.3	11.6	7.0	89	57	30
Mar 25	*****	23.0	17.2	12.4	10.0	94	66	32
Mar 26	*****	24.0	18.8	13.9	6.5	74	48	16
Mar 27	*****	23.2	19.5	15.9	10.1	84	56	40
Mar 28	*****	24.0	20.4	17.9	13.4	87	65	46
Mar 29	*****	26.2	21.5	18.2	15.8	87	70	55
Mar 30	*****	25.7	22.5	20.4	19.1	90	82	69
Mar 31	*****	25.8	21.5	19.7	16.5	96	75	46
<b>Mean</b>	*****	21.3	18.1#	15.9	14.9#	95	84#	69
<b>Maximum</b>	*****	28.8	22.5#	20.5	21.5#	100	97#	96
<b>Minimum</b>	*****	12.8	11.8#	10.8	6.5#	74	48#	16



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

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Mar 1	1.0	010	3.1
Mar 2	0.0	360	3.5
Mar 3	2.5#	***#	*****#
Mar 4	*****	***	*****
Mar 5	0.0#	070#	2.8#
Mar 6	0.5	230	3.0
Mar 7	1.5	010	6.0
Mar 8	7.5	360	6.1
Mar 9	0.5	060	7.0
Mar 10	0.5	070#	6.7#
Mar 11	5.5	070	6.0
Mar 12	8.0	040	5.5
Mar 13	1.5	060	5.3
Mar 14	0.0	020	6.7
Mar 15	3.0	360	4.8
Mar 16	0.5	070	3.5
Mar 17	0.5	190	3.6
Mar 18	0.0	190	3.3
Mar 19	0.0	020	6.9
Mar 20	0.5	010	5.5
Mar 21	0.0	020	9.9
Mar 22	0.0	020	7.0
Mar 23	0.0	360	5.3
Mar 24	1.5	060	10.0
Mar 25	0.0	020	6.0
Mar 26	0.0	020	9.0
Mar 27	0.0	020	9.4
Mar 28	0.0	020	10.3
Mar 29	0.0	020	9.0
Mar 30	0.0	030	6.4
Mar 31	0.0	***	7.5
<b>Mean</b>	-----	020#	6.2#
<b>Total</b>	35.0#	---	-----
<b>Maximum</b>	8.0#	---	10.3#
<b>Minimum</b>	0.0#	---	2.8#

\*\*\* unavailable

# missing (less than 24 hourly observations a day)

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

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

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Apr 1	*****	23.3	19.9	17.9	14.4	86	72	46
Apr 2	*****	24.9	21.3#	19.3	18.2#	100	83#	67
Apr 3	*****	31.4	23.2#	20.3	20.5#	98	85#	59
Apr 4	*****	21.7	20.8	19.9	17.0	94	80	63
Apr 5	*****	22.3	20.3	19.5	19.2	100	93	85
Apr 6	*****	20.3	19.2	17.0	18.8	99	98	94
Apr 7	*****	20.4	18.8	16.8	14.7	97	77	57
Apr 8	*****	21.7	20.2	19.4	17.7	98	86	76
Apr 9	*****	26.1	22.0	19.5	20.4	100	91	71
Apr 10	*****	27.4	23.0	21.0	21.2	98	90	70
Apr 11	*****	29.6	24.5	21.4	21.3	99	84	61
Apr 12	*****	29.5	24.9	21.6	22.3	99	86	64
Apr 13	*****	27.8	25.1	22.8	23.3	98	90	74
Apr 14	*****	29.5	25.9	23.6	24.0	99	90	73
Apr 15	*****	30.3	26.4	23.9	23.5	98	85	59
Apr 16	*****	29.3	25.9	22.1	23.6	98	88	75
Apr 17	*****	22.7	20.6	19.3	19.5	99	94	86
Apr 18	*****	21.6	21.1	20.5	19.5	96	91	84
Apr 19	*****	22.2	21.6	20.7	21.2	99	98	94
Apr 20	*****	22.8	21.2	20.0	20.9	100	99	93
Apr 21	*****	25.9	22.0	19.6	20.8	100	94	73
Apr 22	*****	29.3	23.6	19.5	19.6	100	81	44
Apr 23	*****	25.4	24.1	22.7	23.3	98	96	92
Apr 24	*****	28.0	26.4	24.3	23.6	95	85	76
Apr 25	*****	29.9	27.2	23.6	24.2	96	84	74
Apr 26	*****	30.0	23.9	20.2	20.8	98	84	58
Apr 27	*****	21.9	21.2	20.3	20.5	98	96	89
Apr 28	*****	24.8	23.0	21.1	22.4	99	96	91
Apr 29	*****	28.5	26.1	23.5	25.1	99	95	85
Apr 30	*****	29.4	27.4	25.6	25.2	97	88	79
<b>Mean</b>	*****	25.9	23.0#	20.9	20.9#	98	89#	74
<b>Maximum</b>	*****	31.4	27.4#	25.6	25.2#	100	99#	94
<b>Minimum</b>	*****	20.3	18.8#	16.8	14.4#	86	72#	44

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

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Apr 1	0.0	020	7.0
Apr 2	0.0	020	5.0
Apr 3	0.0	180#	2.6#
Apr 4	0.0	020	7.0
Apr 5	51.5	070#	4.7#
Apr 6	22.0	020	7.5
Apr 7	0.5	020	8.3
Apr 8	3.0	010	8.1
Apr 9	20.5	010	5.7
Apr 10	0.0	200	5.4
Apr 11	0.0	190	4.8
Apr 12	0.0	200	5.5
Apr 13	1.0	200#	4.7#
Apr 14	0.0	190	4.1
Apr 15	0.0	190	4.9
Apr 16	9.5	210	6.2
Apr 17	14.5	050	10.3
Apr 18	0.0	010	7.2
Apr 19	20.5	020	5.1
Apr 20	51.0	350	3.9
Apr 21	0.0	290	3.4
Apr 22	0.0	360	5.5
Apr 23	3.0	190	4.7
Apr 24	0.0	190	7.6
Apr 25	1.0	200	7.3
Apr 26	4.5	080	8.4
Apr 27	27.5	360	7.2
Apr 28	25.0	***	5.5
Apr 29	19.5	***	4.8
Apr 30	3.0	***	7.8
<b>Mean</b>	-----	190#	6.0#
<b>Total</b>	277.5	---	-----
<b>Maximum</b>	51.5	---	10.3#
<b>Minimum</b>	0.0	---	2.6#

\*\*\* unavailable

# missing (less than 24 hourly observations a day)

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

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

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
May 1	*****	29.5	27.8	26.5	25.4	93	87	78
May 2	*****	32.1	28.6	26.7	25.4	94	83	66
May 3	*****	30.8	28.2	26.4	25.7	95	87	74
May 4	*****	30.8	27.1	23.8	25.8	100	93	76
May 5	*****	24.4	24.0#	23.5	23.2#	98	95#	90
May 6	*****	28.5	25.1	23.2	22.4	96	86	66
May 7	*****	29.7	26.0	22.8	23.2	97	85	67
May 8	*****	33.0	28.0	24.2	24.3	99	82	58
May 9	*****	34.0	29.2	25.4	24.6	96	77	56
May 10	*****	33.9	29.2	25.7	24.8	98	78	56
May 11	*****	25.8	24.6	24.0	23.9	97	96	92
May 12	*****	26.7	25.1	23.7	24.1	97	94	85
May 13	*****	31.1	26.5	24.3	24.6	100	90	66
May 14	*****	32.0	27.8	24.5	25.1	99	86	64
May 15	*****	31.0	27.7	25.4	25.4	99	88	71
May 16	*****	28.3	26.2	25.3	25.1	98	94	83
May 17	*****	28.9	26.4	24.8	25.2	99	93	79
May 18	*****	26.1	25.0	24.5	24.5	99	97	94
May 19	*****	29.4	26.0	24.3	25.1	99	95	79
May 20	*****	32.4	26.7	24.8	25.2	100	92	67
May 21	*****	28.2	25.7	24.5	21.7	94	79	65
May 22	*****	27.9	25.2	23.9	19.8	82	72	59
May 23	*****	27.3	25.1	24.0	21.1	86	78	65
May 24	*****	27.5	25.9	24.6	22.5	91	82	75
May 25	*****	30.2	27.3	25.4	24.4	94	84	71
May 26	*****	27.2	26.3	25.4	24.8	98	92	86
May 27	*****	28.5	26.2	25.2	24.7	97	92	80
May 28	*****	26.1	25.0	24.4	24.2	99	95	91
May 29	*****	26.2	25.1	24.2	23.0	96	88	81
May 30	*****	29.3	26.1	24.6	23.7	97	87	71
May 31	*****	30.7	26.5	23.9	23.3	99	83	66
<b>Mean</b>	*****	29.3	26.4#	24.6	24.1#	96	87#	73
<b>Maximum</b>	*****	34.0	29.2#	26.7	25.8#	100	97#	94
<b>Minimum</b>	*****	24.4	24.0#	22.8	19.8#	82	72#	56

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

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
May 1	1.0	190	7.0
May 2	0.0	200	7.2
May 3	0.5	190	6.2
May 4	13.0	030	5.4
May 5	4.0	020#	6.0#
May 6	0.0	020	7.1
May 7	0.0	110	5.4
May 8	0.0	200	5.8
May 9	0.0	200	7.3
May 10	4.5	200	7.6
May 11	12.5	020	7.7
May 12	2.5	040	7.2
May 13	9.0	200	3.7
May 14	0.5	200	5.1
May 15	0.0	110	5.2
May 16	20.0	020	5.2
May 17	26.0	020	5.4
May 18	78.0	140	6.6
May 19	34.5	030	4.9
May 20	19.5	030	5.8
May 21	0.0	060	8.2
May 22	0.0	070	9.7
May 23	0.0	050	9.9
May 24	0.0	080	7.8
May 25	0.0	080	8.0
May 26	19.5	050	6.8
May 27	1.0	080	5.8
May 28	47.0	080	5.6
May 29	0.0	070	7.2
May 30	0.0	060	6.3
May 31	0.0	060	7.1
<b>Mean</b>	-----	030#	6.6#
<b>Total</b>	293.0	---	-----
<b>Maximum</b>	78.0	---	9.9#
<b>Minimum</b>	0.0	---	3.7#

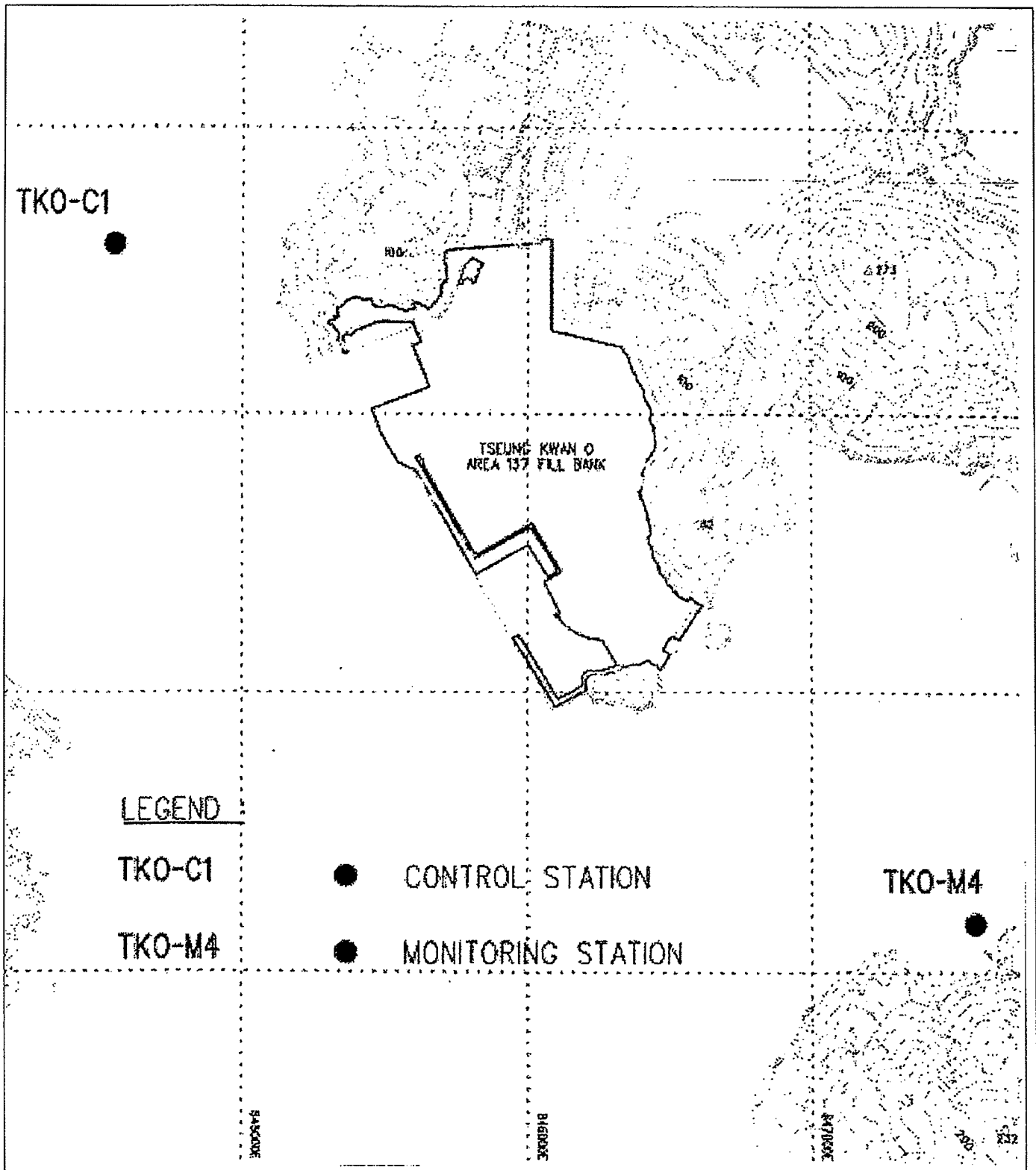
\*\*\* unavailable

# missing (less than 24 hourly observations a day)

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



## Figures

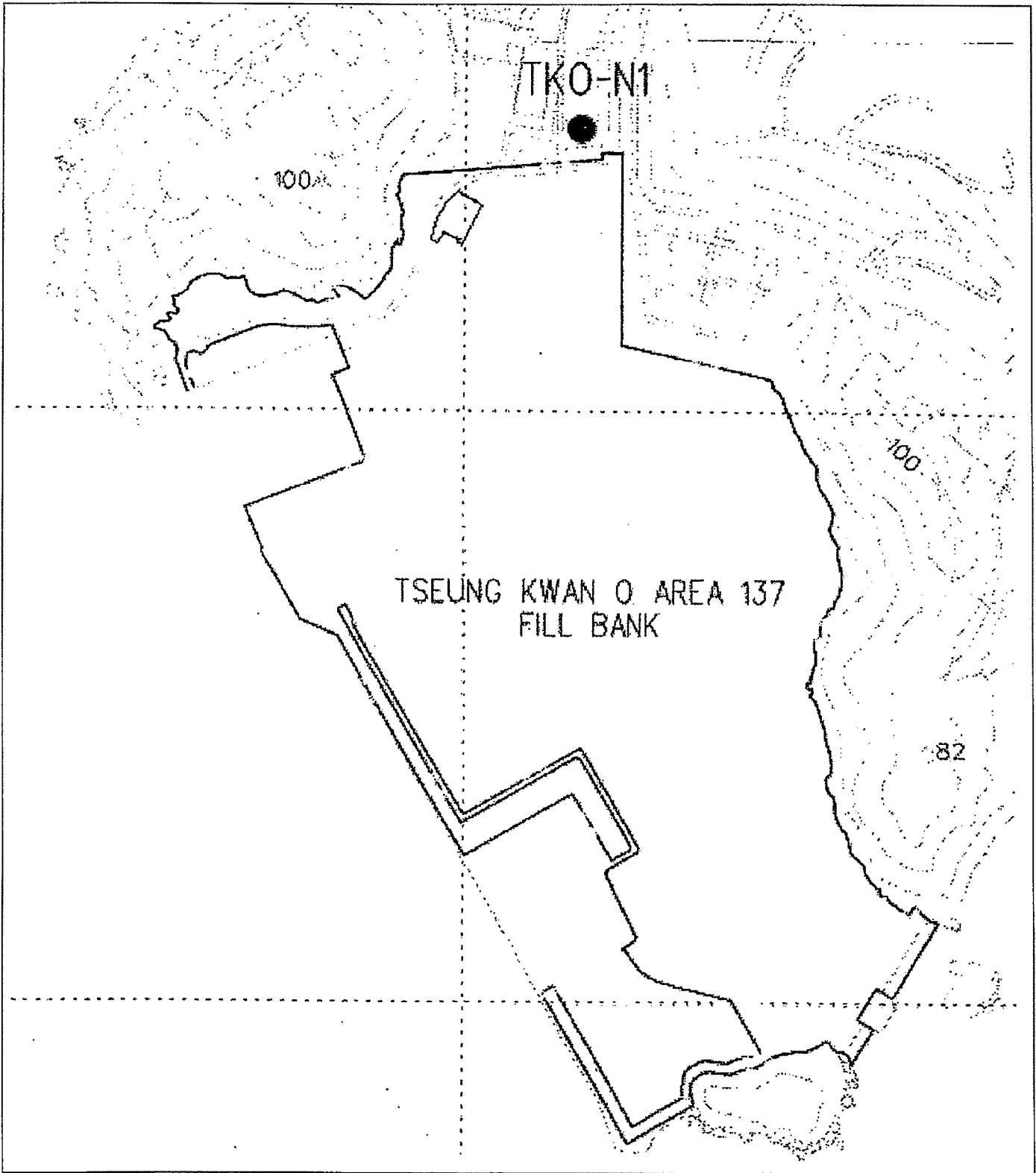


Contract No. CV/2009/02  
 Handling of Surplus Public Fill

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



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



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Contract No.  
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Handling of  
Surplus Public  
Fill

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

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Figure 3a

