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TEST REPORT

CHINA HARBOUR ENGINEERING CO. LTD.

DELIVERY OF RECLAMATION MATERIAL TO MAINLAND – ENVIRONMENTAL MONITORING AND AUDIT (CONTRACT NO.: CV/2005/01)

TSEUNG KWAN O AREA 137 FILL BANK

QUARTERLY EM&A SUMMARY REPORT NO.6

(FROM MARCH TO MAY 2008)

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Issue Date: 30 June 2008 *Report No.: ENA80586*

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MaterialLab

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From	Mr Joseph Poon	No. of Pages	1 (Incl. this page)
C.c. To	Mr P. Y. Lu / Mr W. T. Chau (CEDD)	Fax No.	2714 0113
	Mr William Chan / Mr Albus Cheung (China Habour Engineering Co. Ltd.)	Fax No.	2247 4108
Subject	**Agreement No. CE 9/2005 (EP) Tseung Kwan O Area 137 Fill Bank – Quarterly Environmental Monitoring & Audit Report for March – May 2008**		

We refer to the 6th Quarterly EM&A Report for March to May 2008 that we received through email on 27th June 2008 and are pleased to confirm we have no further comment on the report.

Should you require further information, please feel free to contact us.

Best regards,

Joseph Poon
Independent Environmental Checker

JP/cwl

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EXECUTIVE SUMMARY

This is the sixth Quarterly Environmental Monitoring and Audit (EM&A) Report prepared by ETS-Testconsult Ltd (ET) for the "Contract No. CV/2005/01 Delivery of Reclamation Material to Mainland – 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 2008.

Construction Progress

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

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

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 exceedances of Action and Limit levels for noise monitoring were recorded in the reporting quarter.

Air Monitoring

During the reporting quarter, no exceedances of Action and Limit levels were recorded for 24-hr and 1-hr TSP monitoring. The air quality during the operation hours of the Fill Bank was considered acceptable.

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 exceedances of Action and Limit Level were 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 complaints, notification of summons and prosecutions with respect to environmental issues were received in this quarter.

1.0 INTRODUCTION

China Harbour Engineering Company Limited (CHEC) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the "Contract No. CV/2005/01 Delivery of Reclamation Material to Mainland – Tseung Kwan O Area 137 Fill Bank" (The Project).

In accordance with the Environmental Permit (No.: EP-134/2002/F) (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 in March, April and May 2008.

2.0 PROJECT INFORMATION

2.1 Construction Progress in this reporting quarter

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 Construction Programme

Details of construction programme 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. W T CHAU* *Mr. H C TANG*	*Engineer's Representative*	*2760 5835*	*2714 0113*
IEC (Materialab)	*Mr Joseph POON*	*IEC*	*2450 8238*	*2450 6138*
Contractor (CHEC)	*Mr. William CHAN*	*Contractor's Agent*	*9772 7055*	*2243 4089*
ET (ETL)	*Mr 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 4 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.

Table 5.1 Summary of environmental licensing and permit status

Description	*Permit No.*	*Valid Period*		*Section*
		From	*To*	
Amended Environmental Permit	*EP-134/2002/F*	*26/01/06*	*---*	*(Valid)* ▪ *Site clearance* ▪ *Construction of a temporary storm water system* ▪ *Stockpiling of 6 million m3 of public fill* ▪ *Setting up two barging points for transporting the stockpiled public fill by barges* ▪ *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* ▪ *Construction of operation of a construction and Demolition Material Sorting Facility (C&DMSF)* ▪ *Setting up a Construction and Demolition Material Crushing Facility at the TKO Basin* ▪ *Remove the temporary fill bank*
Chemical Waste Producer	*5123-839-C1186-05*	*04/01/07*	*---*	*Spent Lubricating oil / Spent Flammable Liquid / Spent Battery / Surplus Paint*
Effluent Discharge License	*RE/D1185/839/1*	*06/07/07*	*31/07/12*	*Wastewater arising from the wheel washing bay, Sedimentation Tank & Desilting Tank*

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 2008*	*April 2008*	*May 2008*
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*	*420 kg*	*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 exceedances of Action and Limit Level of marine water quality, 24-hr and 1-hr TSP monitoring results were recorded. Besides, no day-time noise level measured at the monitoring station exceeded the Action and Limit Level in this reporting quarter.

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

Since there were no exceedances on marine water quality, air quality and noise monitoring parameters recorded in this monitoring quarter, the review of the reasons for the non-compliance was not required.

6.3 Summary of Actions Taken

Since no exceedances were recorded, no further actions were required.

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

No complaints, notifications of summons and successful prosecutions were received. A summary of environmental complaints and prosecutions was given in Table 6.1 and further details of the complaint could be found in the Complaint Log (Appendix K).

Table 6.1 Summary of Environmental Complaints and Prosecutions

Period	*Complaints logged*	*Summon served*	*Successful Prosecution*
March 2008	*0*	*0*	*0*
April 2008	*0*	*0*	*0*
May 2008	*0*	*0*	*0*
Cumulative	*0*	*0*	*0*

7.0 COMMENTS, CONCLUSIONS AND RECOMMENDATION

This report presents the fourth quarter of the Fill Bank operation. 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 exceedances of Action and Limit Level of air quality, noise and marine water quality monitoring were recorded in this reporting quarter.

No complaints, notification of summons and prosecutions with respect to environmental issues were 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 the reporting 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 the trapezoidal channels, permanent desilting chambers, DP3 & DP4 regularly;
- Operate and maintain the silt curtains regularly;
- Check and maintain the silt curtain regularly;
- Operate the cleaning vessel within the TKO Basin regularly;
- Provide proper treatment for the wastewater discharged 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 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

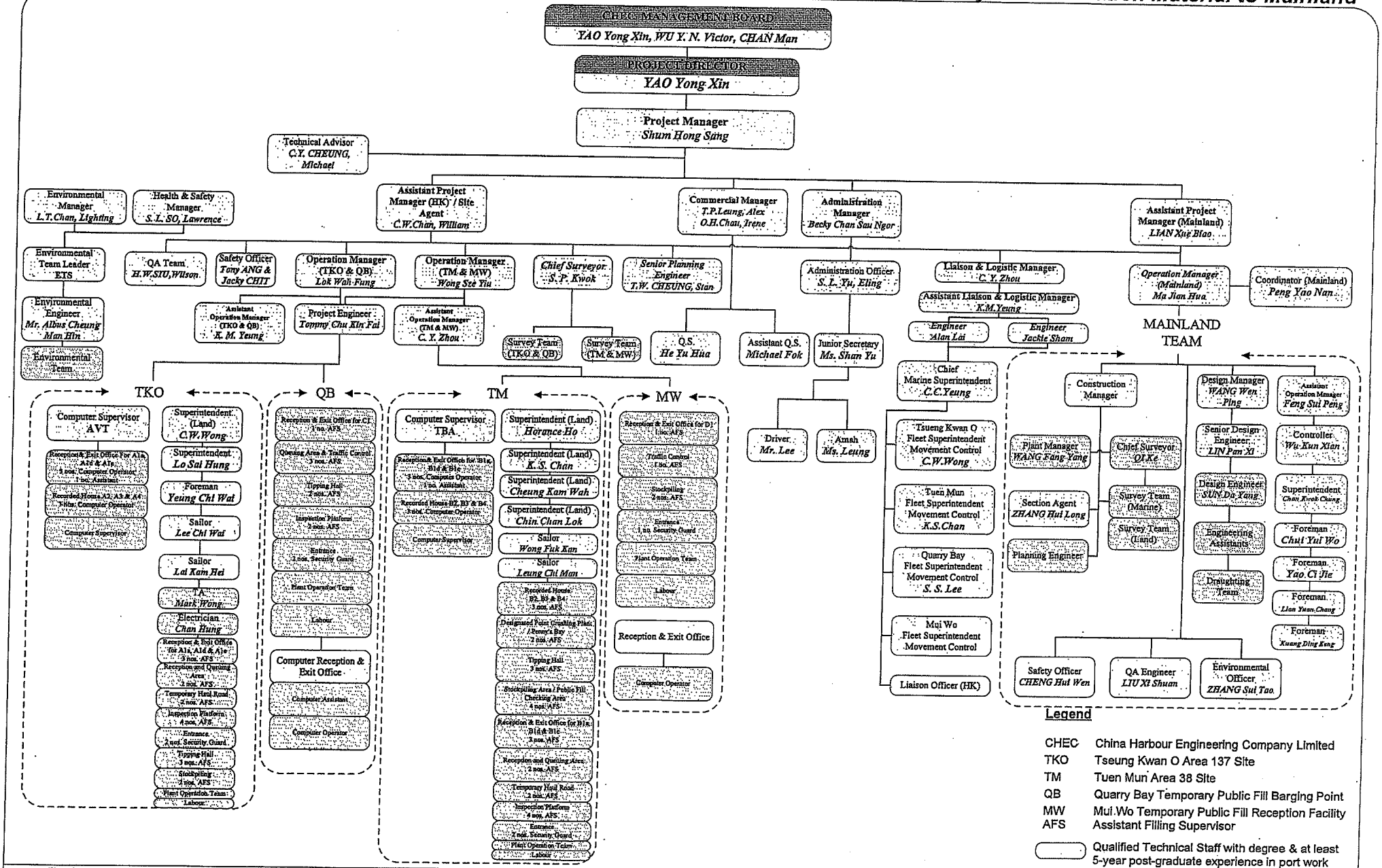
- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding / chaining fences in accordance with agreed design at proper location; and
- Maintain the hydroseeding slopes in accordance with the Landscape Plan.

Appendix A

Organization Chart and Lines of Communication

CEDD **Civil Engineering and Development Department**

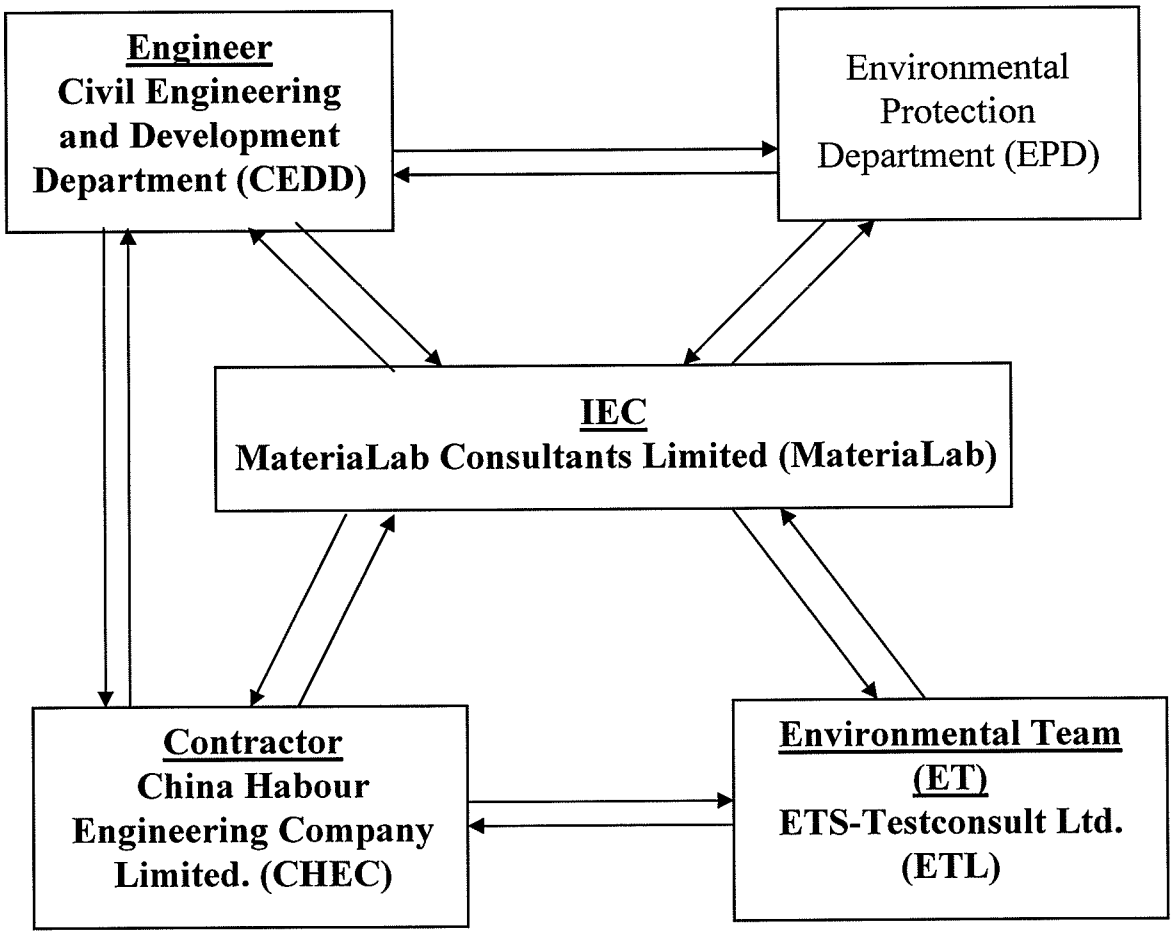
Contract No. CV/2005/01
Delivery of Reclamation Material to Mainland



China Harbour Engineering Company Limited

Organisation Chart Rev.8
2 June 08

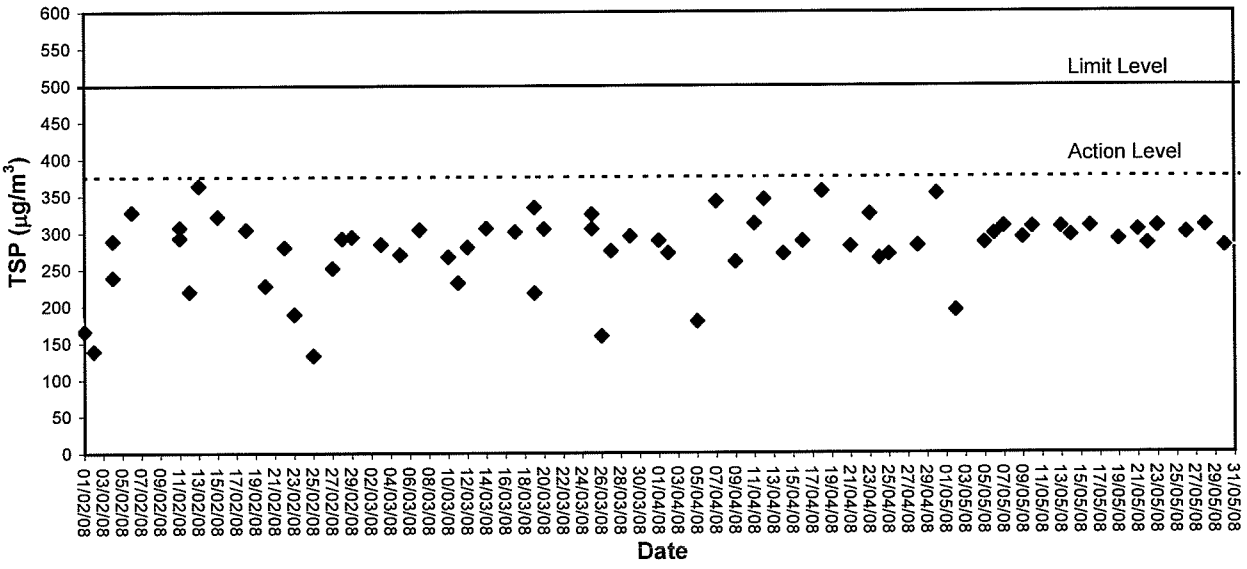
Lines of Communication



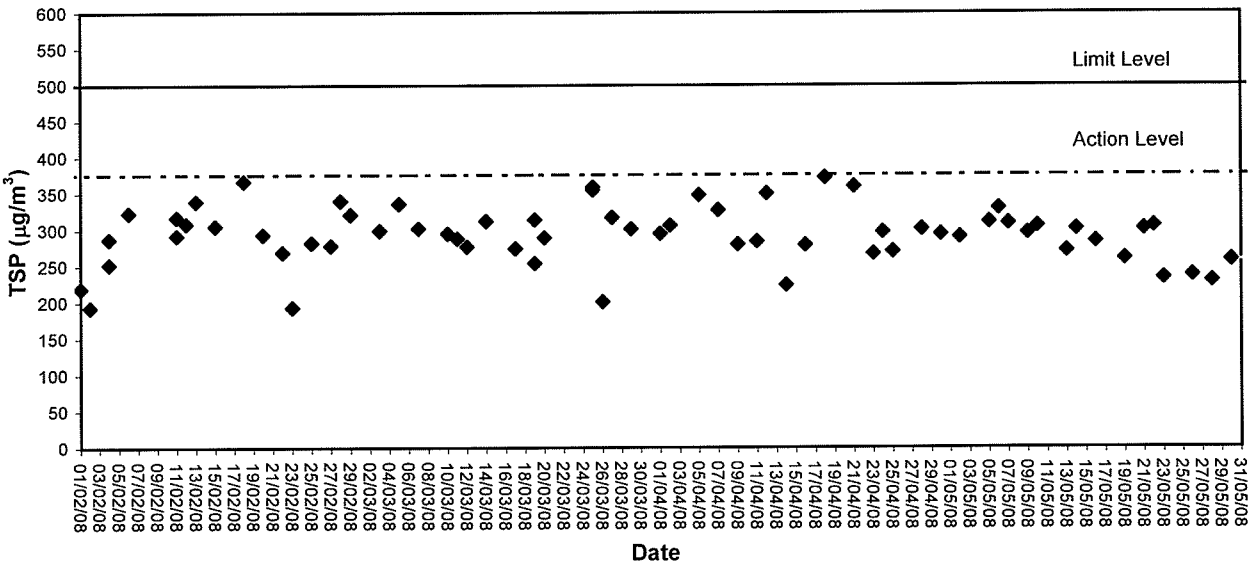
Appendix B

Graphical Plots of Air Quality Monitoring Data

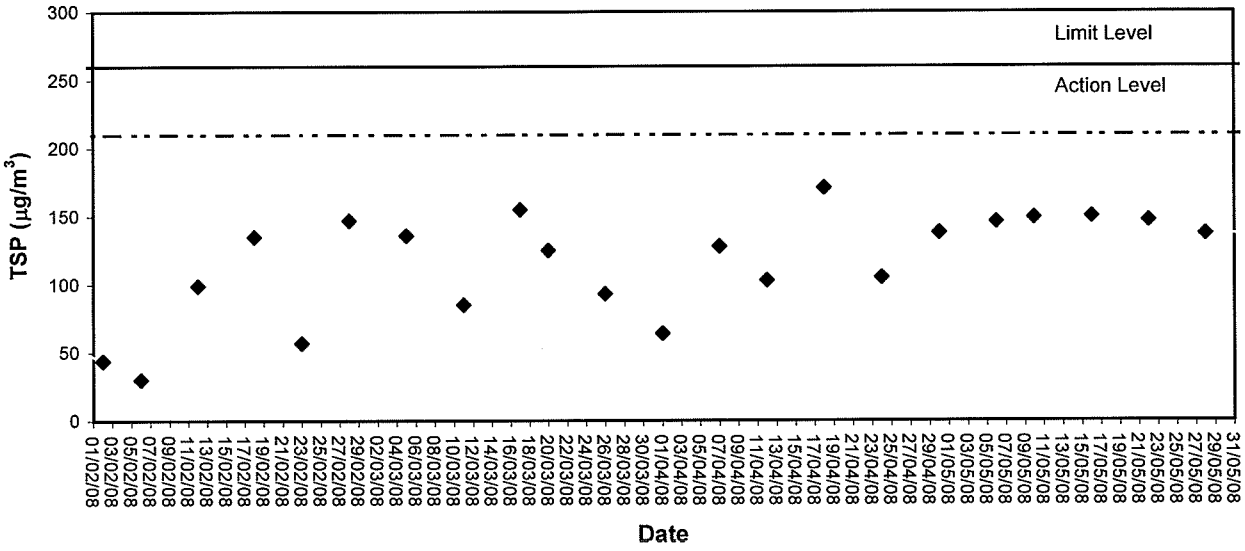
1-hour TSP level at TKO-A1 (Outside CEDD Site Office)



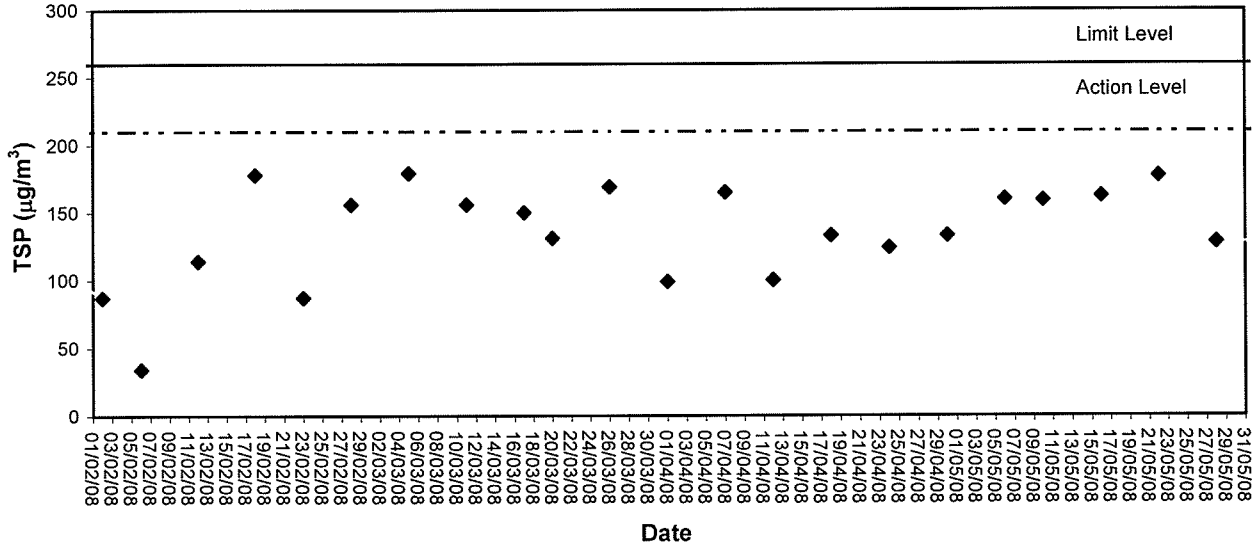
1-hour TSP level at TKO-A2 (Site Egress)



24-hour TSP level at TKO-A1 (Outside CEDD Site Office)



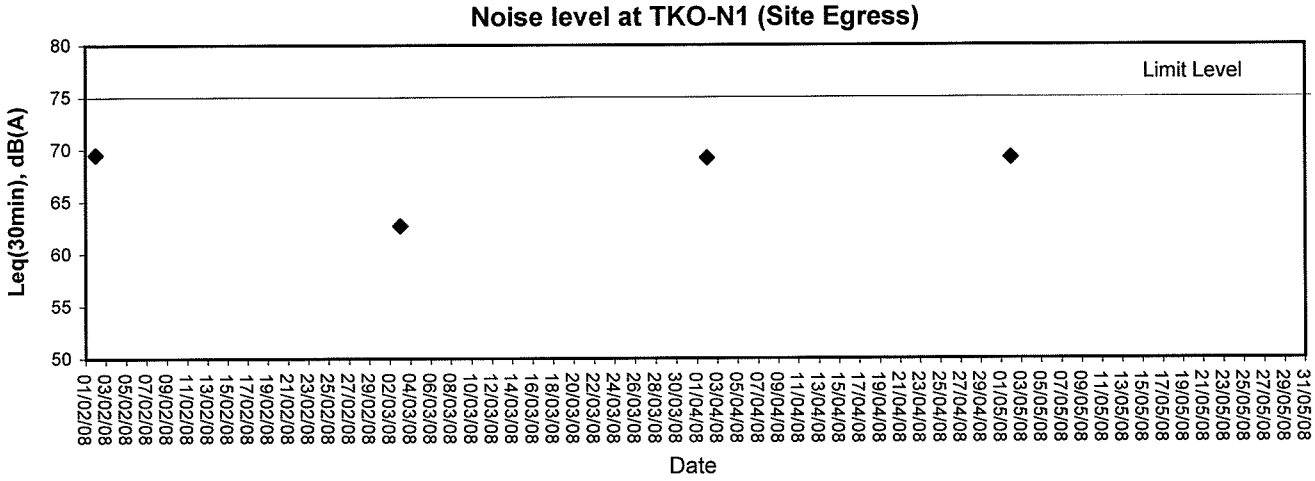
24-hour TSP level at TKO-A2 (Site Egress)



Appendix C

Graphical Plots of Noise Monitoring Data

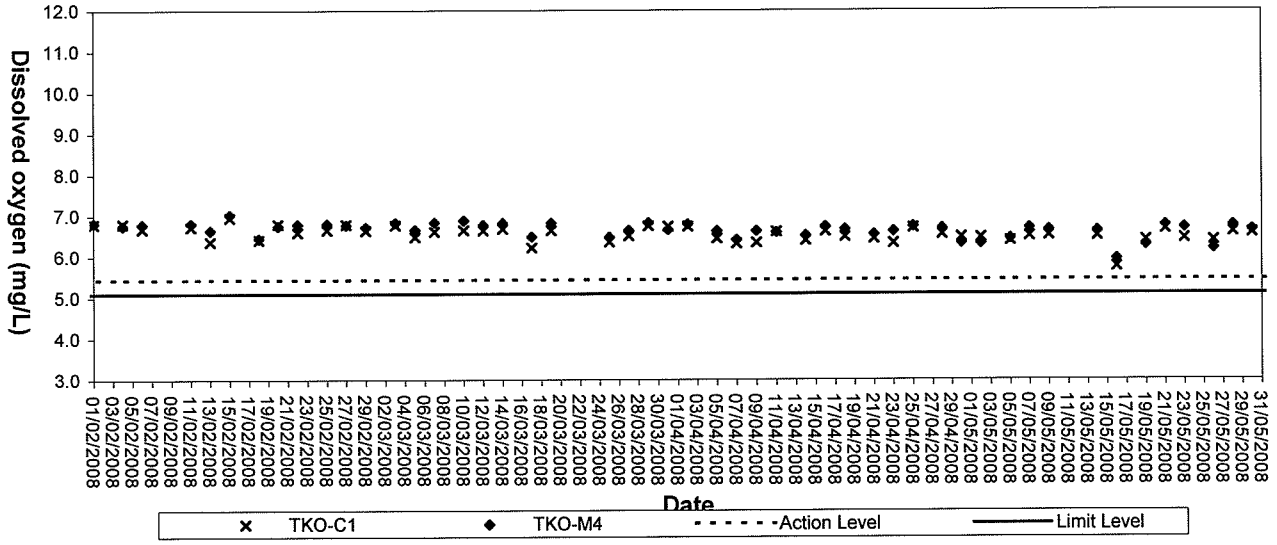
Noise Monitoring (Day-time)



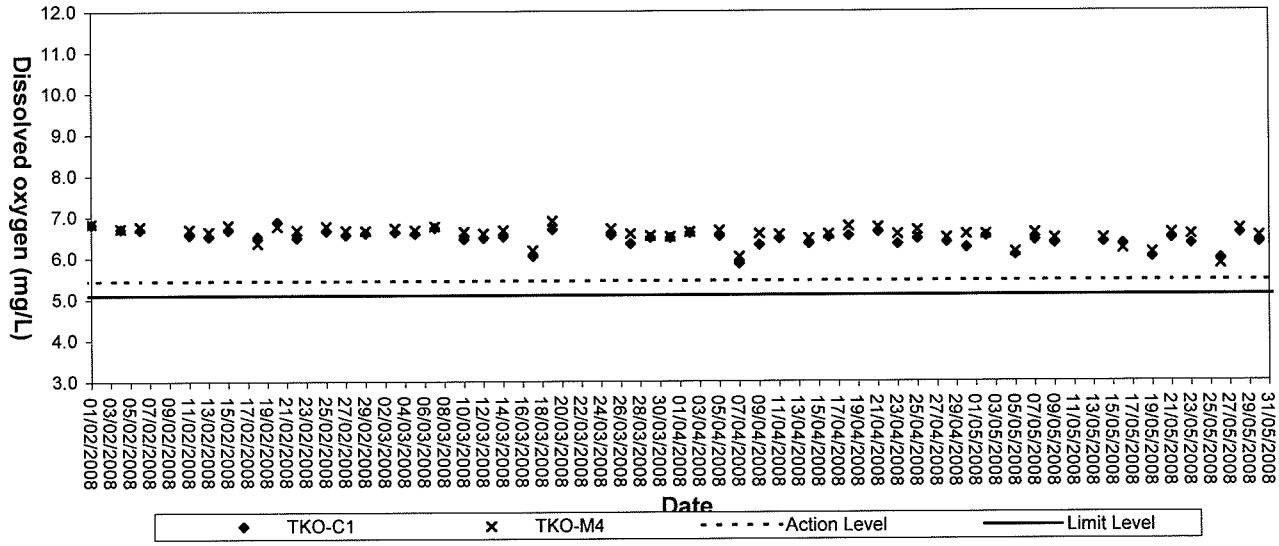
Appendix D

Graphical Plots of Impact Marine Water Quality Monitoring Data

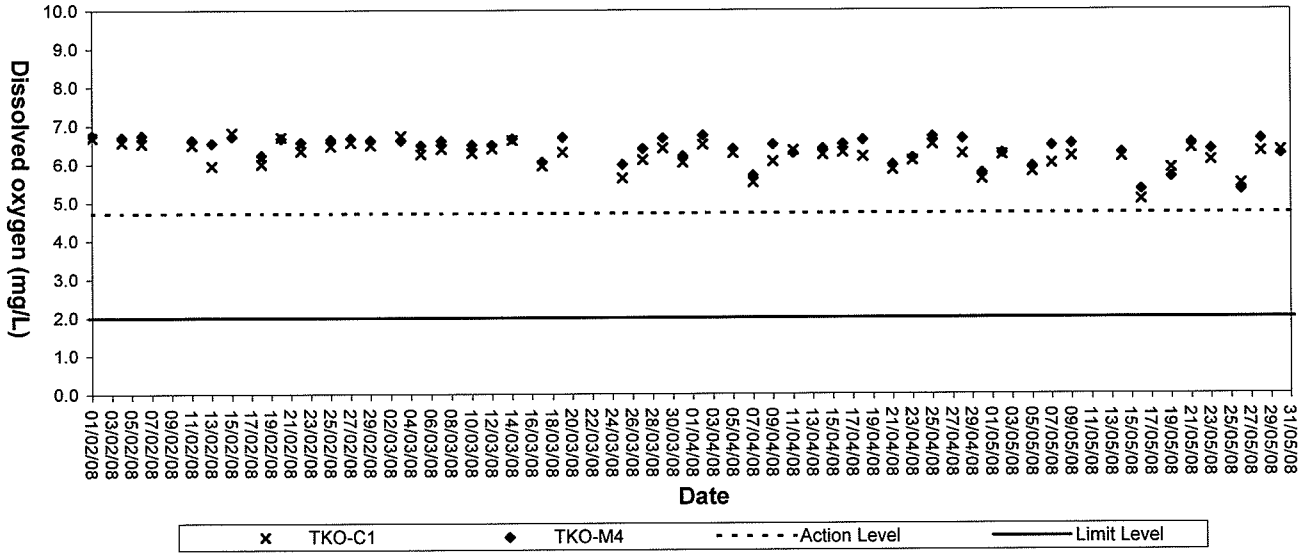
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



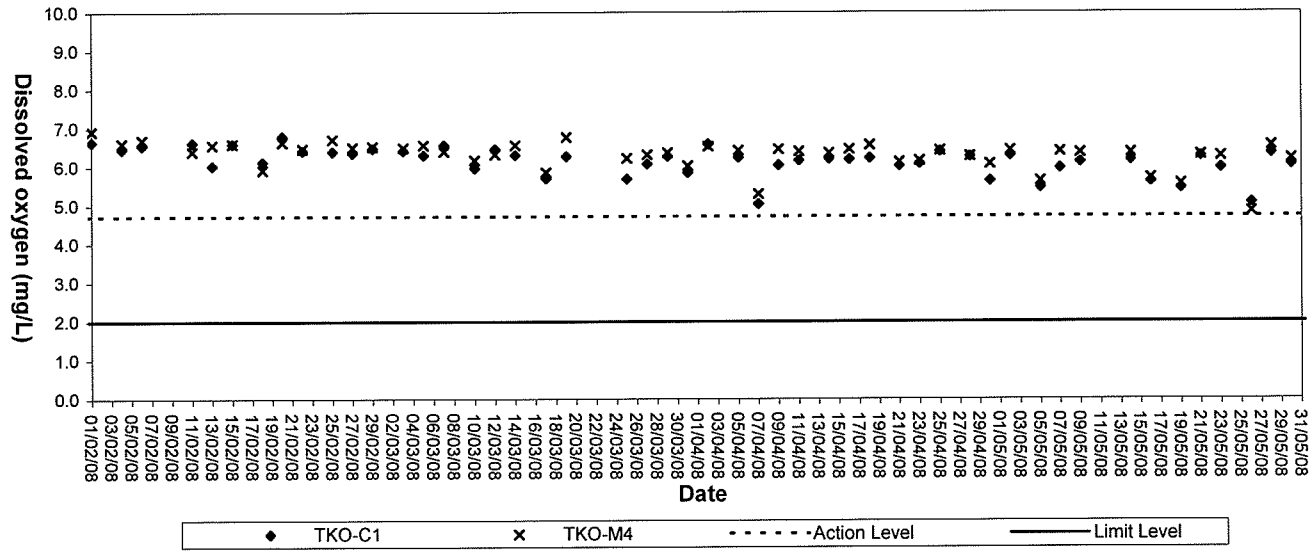
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



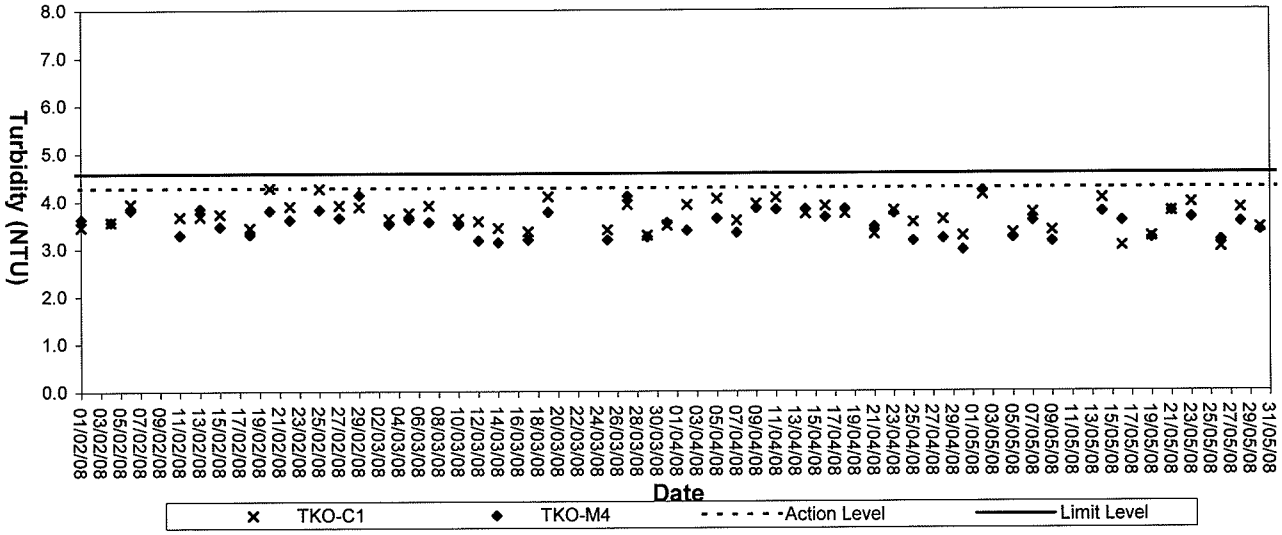
Dissolved Oxygen (Bottom) at Mid-Flood Tide



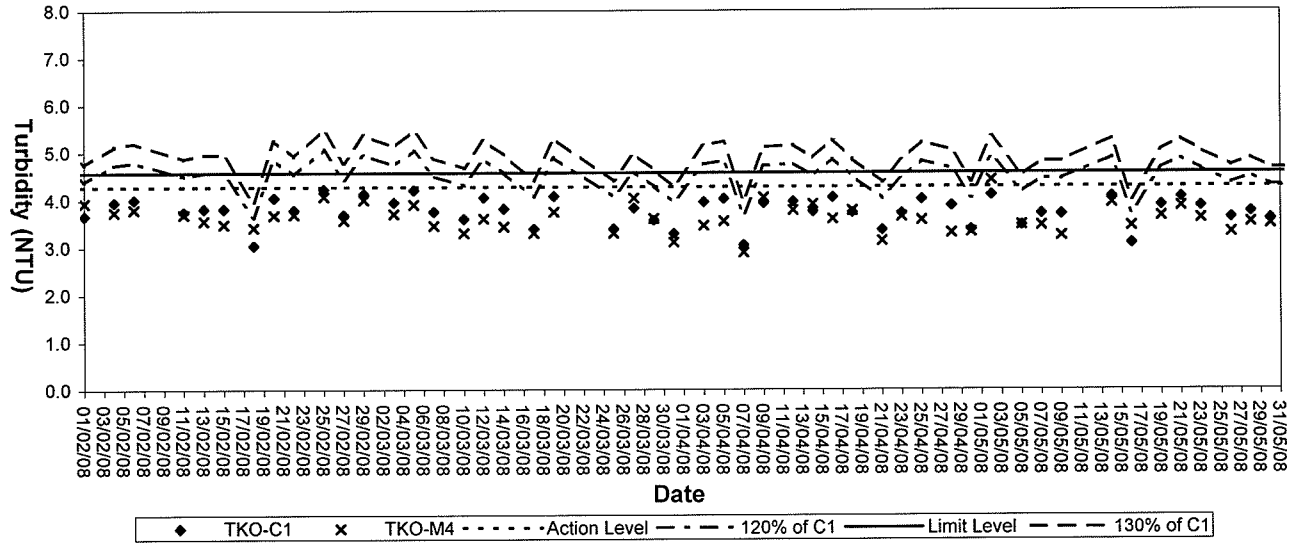
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



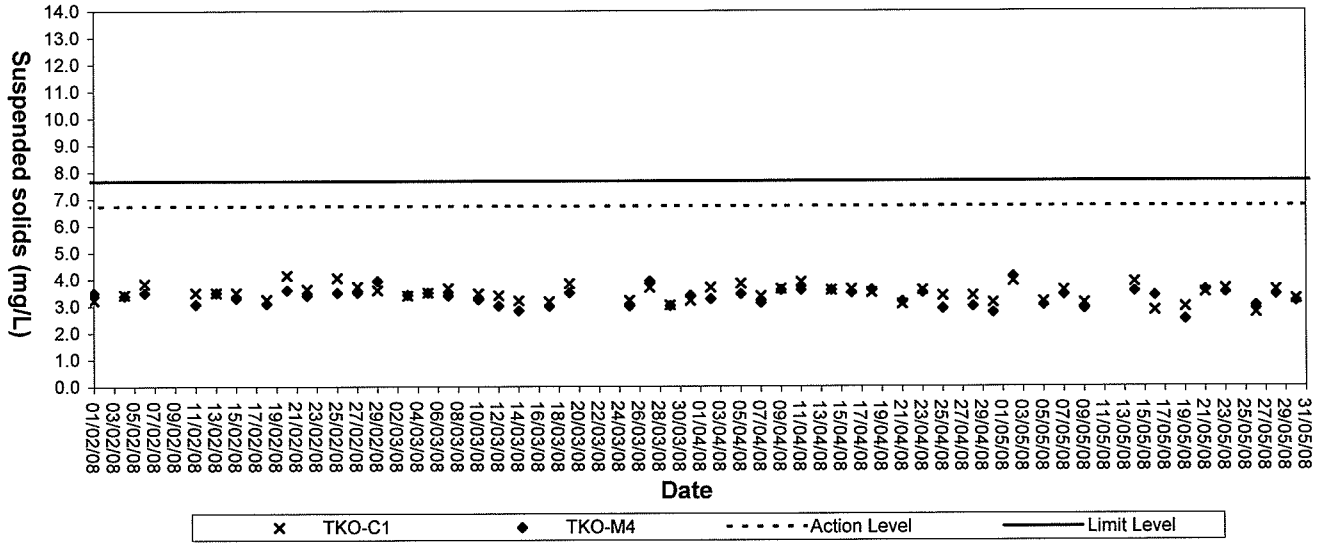
Turbidity (Depth-average) at Mid-Flood Tide



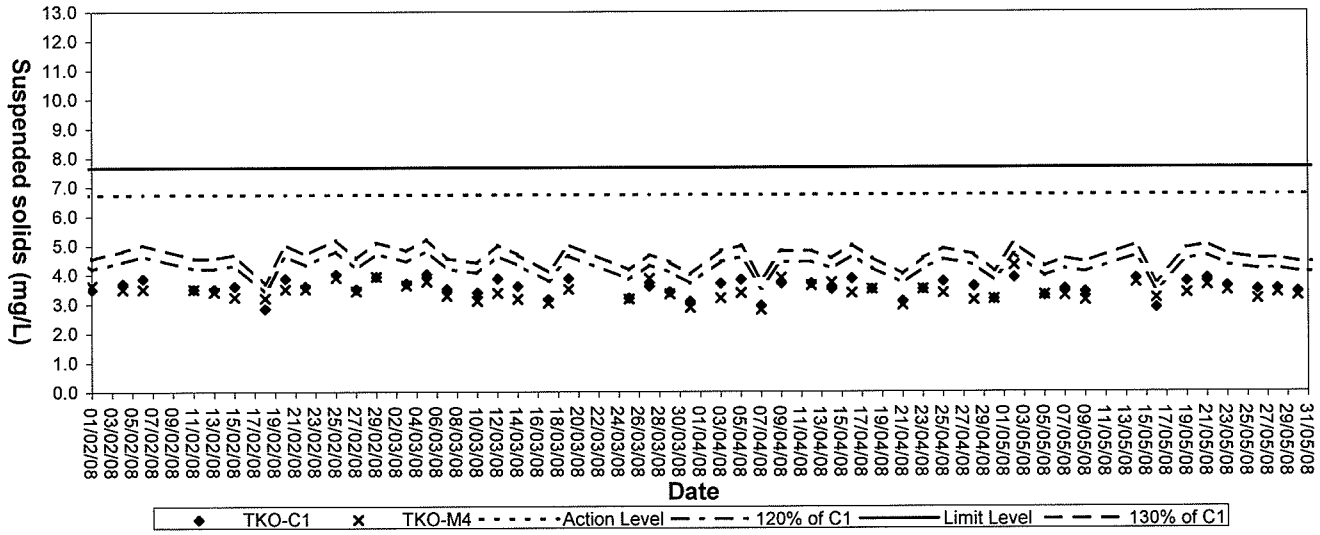
Turbidity(Depth-average) at Mid-Ebb Tide



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, $\mu g/m^3$	Limit Level, $\mu g/m^3$
AA1	376	500
AA2		

Action and Limit Levels for 24-Hour TSP

Location	Action Level, $\mu g/m^3$	Limit Level, $\mu g/m^3$
AA1	210	260
AA2		

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 DO < 5.45 (5%-ile of baseline data) Bottom DO < 4.72 (5%-ile of baseline data)	Surface & Middle DO < 5.10 (1%-ile of baseline data) Bottom 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
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, IC(E) and Contractor 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by the ET 2. Check contractor's working method	1. Notify Contractor	1. Rectify any unacceptable practise 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 2. Inform IC(E) and Contractor 3. Repeat measurements to confirm finding 4. Increase monitoring frequency to daily 5. Discuss with IC(E) and Contractor on remedial actions 6. If exceedance continues, arrange meeting with IC(E) and ER. 7. If exceedance stops, cease additional monitoring	1. Check monitoring data submitted by the ET Leader 2. Check the Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IC(E) within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, Contractor and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results	1. Check monitoring data submitted by the ET Leader 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise the ER on the effectiveness of the proposed remedial measures 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate.

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

Event	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; 2. Repeat in-situ measurement to confirm findings; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days 8. Repeat measurement on next day of exceedance if exceedance is due to the construction works	1. Notify the ER and IEC in writing within 24 hours of identification of exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance 5. Consider changes of working method if exceedance is due to the construction works 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale	1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Require contractor to propose remedial measures for the analysed problem if related to the construction works 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the mitigation measure	1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures 4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly 5. Supervise the implementation of mitigation measures

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

Event	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; 2. Identify source(s) of impact; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with IEC, ER and Contractor within 4 working of identification of an exceedance 8. Ensure mitigation measures are implemented; 9. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Notify IEC and ER in writing; within 24 hours of the identification of the exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of the identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale	1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the implemented mitigation measures.	1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures. 4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly. 5. Assess the effectiveness of the implemented mitigation measures

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

Appendix G

Construction Programme

Project Activities at TKO Area 137 (From March to May 2008)

Activity ID	Activity description	Original duration	Remaining duration	Percent complete	Early start	Early finish	Late start	Late finish
EOA1A200	A1a Servicing 24mths	731	282	62	16/11/06A	30/11/2008	16/11/06A	30/11/2008
EOA1A400	Measurement System O&M for A1a 104wks	728	279	62	01/12/06A	27/11/2008	01/12/06A	30/11/2008
EOA1D200	A1b Servicing 22mths stg 2	670	282	58	01/02/07A	30/11/2008	01/02/07A	30/11/2008
EOA1E200	A1e Servicing 22mths	580	282	52	21/04/07A	30/11/2008	21/04/07A	30/11/2008
EOA1E400	Measurement System O&M for A1e 94wks	580	270	53	21/04/07A	18/11/2008	21/04/07A	30/11/2008
HK020800	RealTime Tracking/Monitoring of Vessel set up	60	1	99	01/03/07A	25/02/2008	01/03/07A	25/02/2008
HK020900	Testing & Commissioning RealTime Tracking/Moni	60	1	99	16/03/07A	26/02/2008	16/03/07A	26/02/2008
HK021000	Maintenance of RealTime Tracking (56wks)	392	191	55	03/07/07A	31/08/2008	03/07/07A	30/11/2008
HK030200	Sorting of Stockpiled Public Fill	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
HK030300	Removal of Stockpiled Public Fill (contractor's)	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
HK030400	Removal of Sotckpiled Public Fill (Others)	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
HK030500	Disposal of Unsuitable Material	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
HK030600	Compaction of Public Fill	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
HK110200	TKO Tipping Halls Operation 260nr-wks	731	282	61	10/12/06A	30/11/2008	10/12/06A	30/11/2008
RHA20200	Record House A2 Servicing 24mths	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
RHA40200	Record House A4 Servicing 21mths	639	240	60	01/03/07A	19/10/2008	01/03/07A	30/11/2008
SOA10200	RE Principal Office Servicing (A1) 23mths	700	332	54	01/02/07A	19/01/2009	01/02/07A	30/01/2009
TACA0200	Servicing 24mths	731	282	61	01/12/06A	30/11/2008	01/12/06A	30/11/2008
TS018100	Design of RealTime Tracking/Monitor Approval	0	0	0		22/02/2008		22/02/2008

Appendix H

Implementation Schedule of Environmental Mitigation Measures (EMIS)

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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				√
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

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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	√			
▪ 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&DMFS				√
▪ 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)	√			
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	√			

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

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	0.3223
Quarterly Mean	37	0	3.294	0.332	0.0553

Result:

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

Difference between means = 3.675 (Std Dev = 1.0717 and SE = 0.3134)
(95% CI : 3.0608 < Diff < 4.2892)

t-value of difference = 11.727 (11 degrees of freedom)
P = 0 (<0.001)

Conclusion:

There is a 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	0.2864
Quarterly Mean	37	0	3.427	0.305	0.0508

Result:

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

Difference between means = 3.542 (Std Dev = 0.9554 and SE = 0.2788)
(95% CI : 2.9956 < Diff < 4.0884)

t-value of difference = 12.705 (11 degrees of freedom)
P = 0 (<0.001)

Conclusion:

There is a 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	0.4369
Quarterly Mean	37	0	3.376	0.309	0.0515

Result:

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

Difference between means = 3.521 (Std Dev = 1.4181 and SE = 0.4214)
(95% CI : 2.6951 < Diff < 4.3469)

t-value of difference = 8.356 (11 degrees of freedom)
P = 0 (<0.001)

Conclusion:

There is a 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	0.3151
Quarterly Mean	37	0	3.531	0.289	0.0482

Result:

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

Difference between means = 3.402 (Std Dev = 1.0379 and SE = 0.3054)
(95% CI : 2.8034 < Diff < 4.0006)

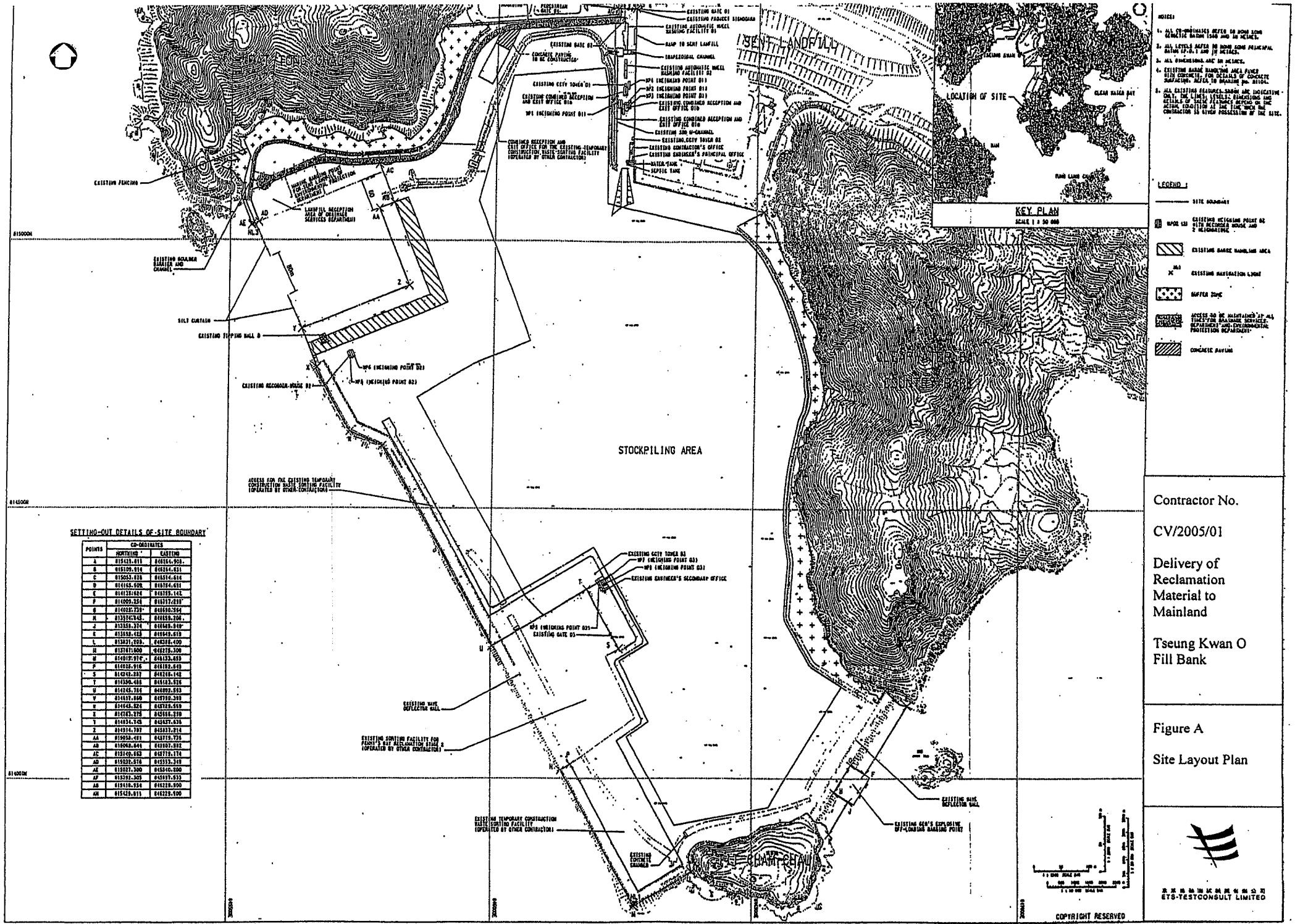
t-value of difference = 11.14 (11 degrees of freedom)
P = 0 (<0.001)

Conclusion:

There is a statistically significant difference between the groups.

Appendix J

Site General Layout plan



POINTS	CO-ORDINATES	
	NORTHING	EASTING
A	815421.811	846164.908
B	815109.814	846264.631
C	815053.828	845514.616
D	814765.592	845764.631
E	814139.624	846155.142
F	814009.254	846317.239
G	814028.739	846450.364
H	813976.545	846459.206
J	813859.374	846465.849
K	813859.488	846540.819
L	813831.888	846586.490
M	813787.902	846578.309
N	814019.914	846453.833
P	814028.916	846182.848
S	814248.282	846206.142
T	814396.488	846183.526
U	814245.784	846002.583
V	814157.868	845780.389
W	814148.524	845728.599
X	814281.278	845566.298
Y	814434.745	845437.636
Z	814574.787	845537.214
AA	815034.481	845779.726
AB	815040.644	845787.882
AC	815249.653	845778.174
AD	815231.876	845553.348
AE	815027.300	845540.280
AF	815398.305	845997.533
AG	815436.534	846228.900
AH	815429.811	846229.100

Contractor No.

CV/2005/01

Delivery of Reclamation Material to Mainland

Tseung Kwan O Fill Bank

Figure A

Site Layout Plan

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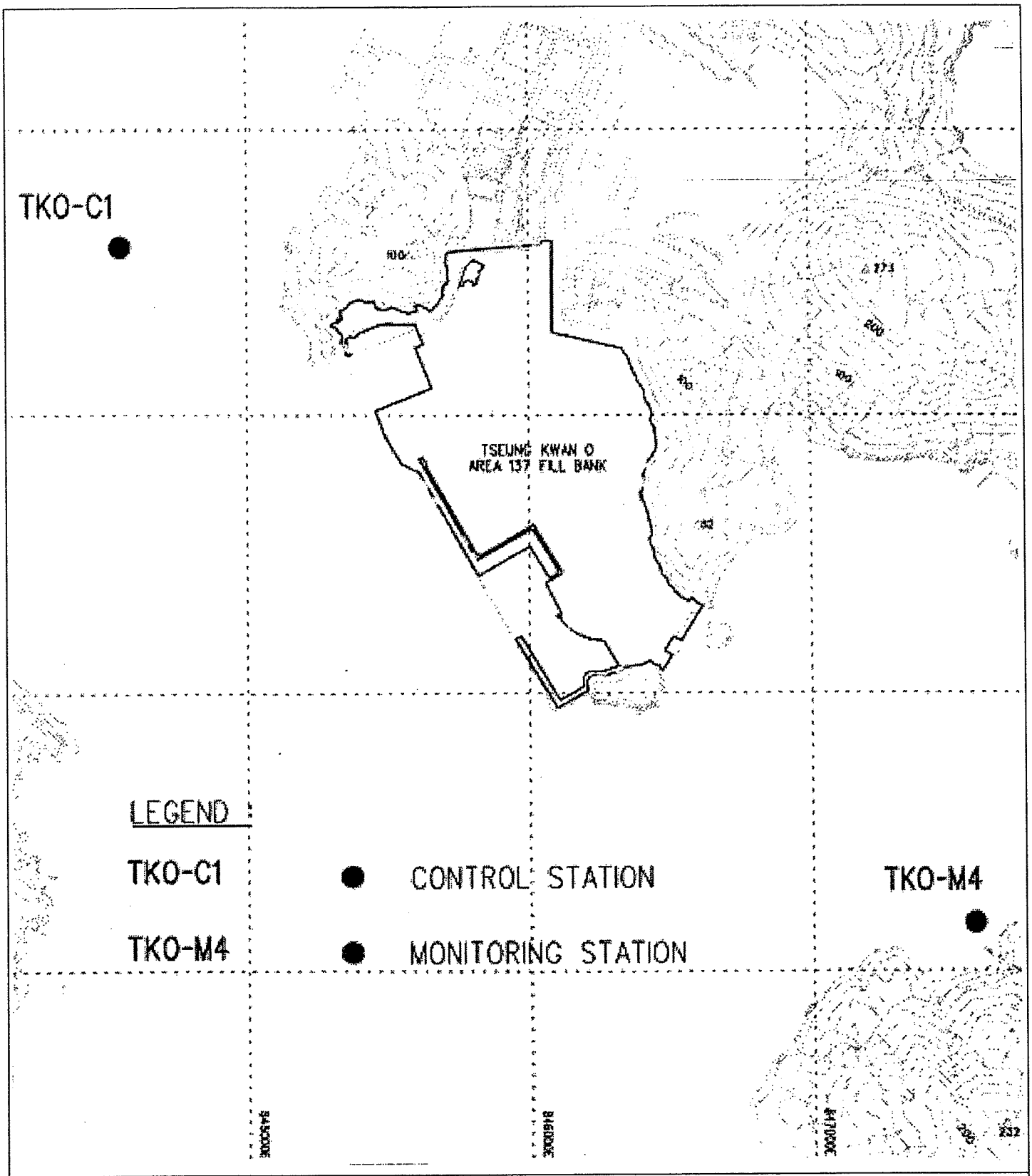
Figures



Contract No. CV/2005/01
Delivery of Reclamation Material to Mainland – Tseung Kwan O Fill Bank

Figure 1

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

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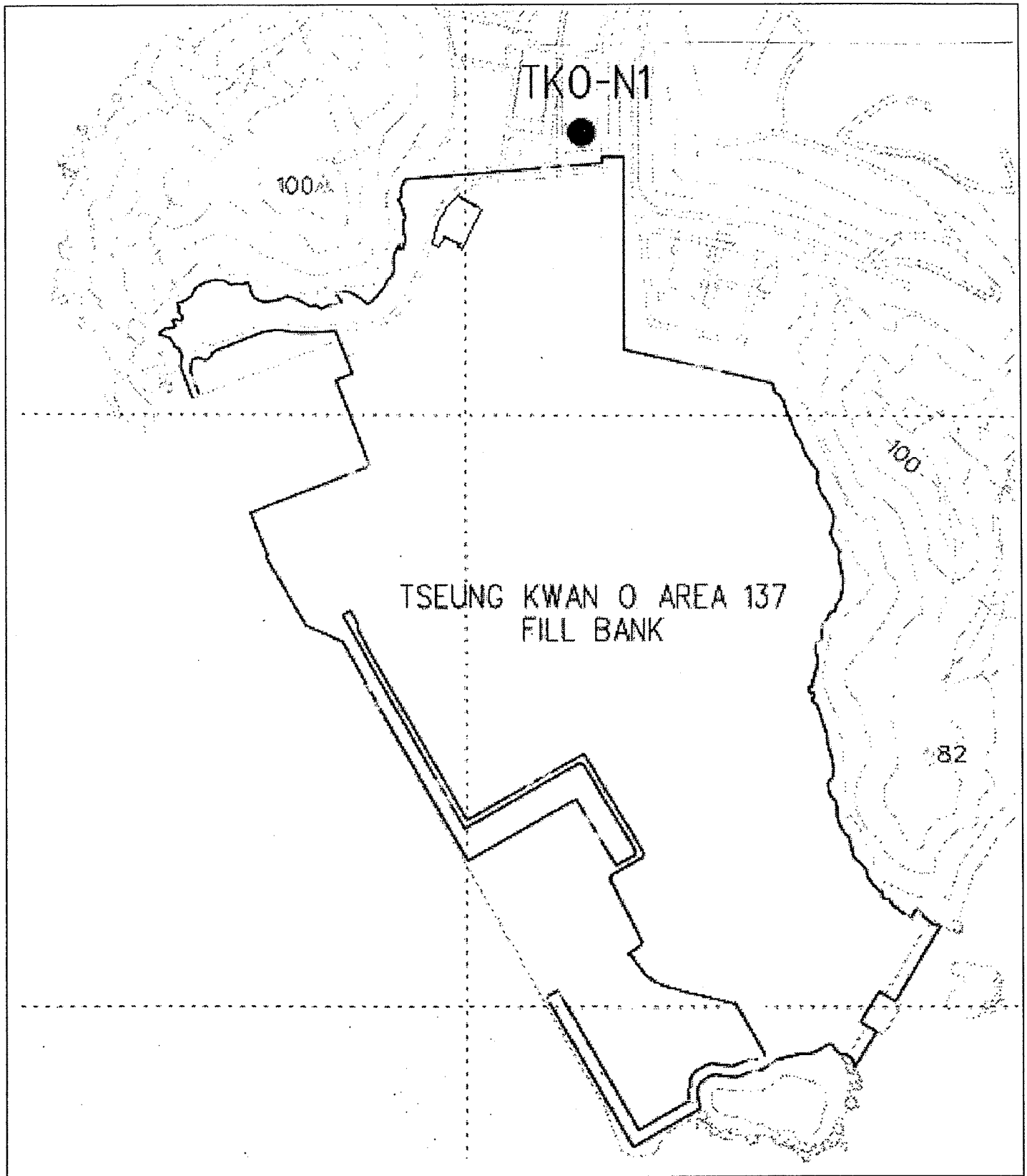

Contract No. CV/2005/01
Delivery of Reclamation Material to Mainland – Tseung Kwan O Fill Bank

Figure 2

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

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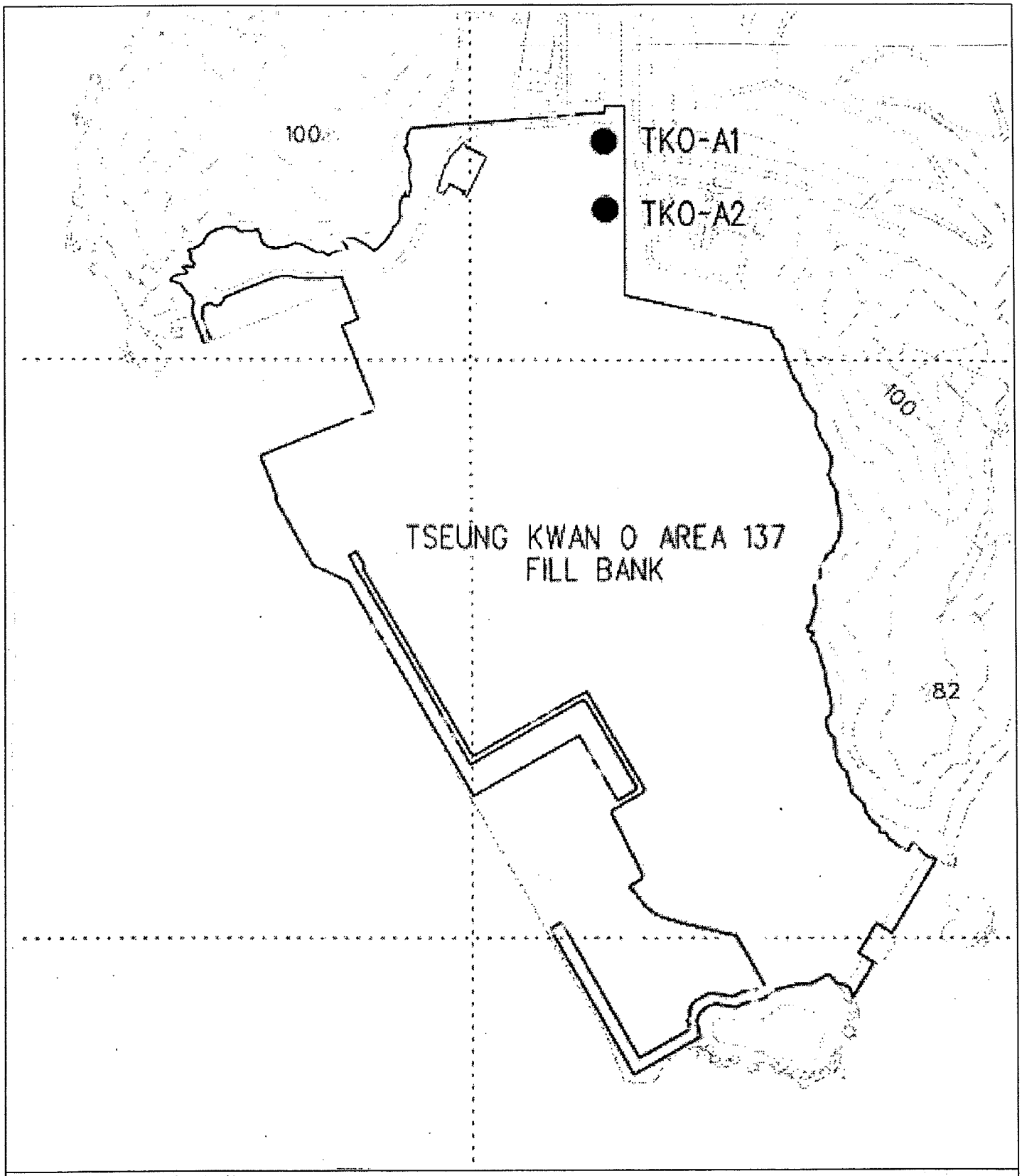

Contract No. CV/2005/01
Delivery of Reclamation Material to Mainland – Tseung Kwan O Fill Bank

Figure 3

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

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