



Permanent Aviation Fuel Facility (EP-262/2007/B)

First Annual Environmental Monitoring and Audit Report – July 2007 to June 2008

20th August 2008

Environmental Resources Management

21/F Lincoln House
Taikoo Place, 979 King's Road
Island East, Hong Kong
Telephone 2271 3000
Facsimile 2723 5660

www.erm.com



Permanent Aviation Fuel Facility for Hong Kong International Airport

Environmental Certification Sheet EP-262/2007/B


Reference Document/Plan

Document/ Plan -to be Certified/ Verified:	1 st Annual EM&A Report July 2007 to June 2008
Date of Report:	20 th August 2008
Date received by ET:	20 th August 2008
Date received by IEC:	20 th August 2008


Reference EM&A Manual Recommendation

EM&A Manual Recommendation:	Sections 13.5 and 13.6
Content:	<i>EM&A Reports</i>
13.5	A maximum of 4 copies of each EM&A Report shall be submitted
13.6	An annual EM&A Report will be prepared by the ET at the end of each construction year during the course of the project.

ET Certification

I hereby certify that the above referenced document/ plan complies with the above referenced sections of the EM&A Manual recommendation	
Craig A Reid, Environmental Team Leader:	 Date: 20 th August 2008

IEC Verification

I hereby verify that the above referenced document/ plan complies with the above referenced sections of the EM&A Manual recommendation	
Dr KL Pun, Independent Environmental Checker:	 Date: 11/9/2008


Notes: EP-262/2007/B has replaced the former EP-262/2007/A, EP-262/2007 and EP-139-2002/A for the PAFF project after the resubmission of revised EM&A Manual and revised EIA Report respectively.

**Permanent Aviation Fuel Facility (EP-262/2007/B)
First Annual Environmental Monitoring and Audit Report
July 2007 to June 2008**

20th August 2008

Prepared by: Karen Lui/Craig A Reid

Document Code: 0018105_EM&AR_1st Annual_Aug 08_v0.doc

For and on behalf of
Environmental Resources Management
Approved by: Craig A Reid
Signed: 
Position: Environmental Team Leader
Date: 20th August 2008

CONTENTS

	EXECUTIVE SUMMARY	I
1	INTRODUCTION	1
1.1	PURPOSE OF THE REPORT	1
1.2	KEY CONTACT INFORMATION	2
2	ENVIRONMENTAL STATUS	3
2.1	PROJECT AREA	3
2.2	ENVIRONMENTAL SENSITIVE RECEIVERS	3
2.3	MAJOR CONSTRUCTION ACTIVITIES	3
2.4	MONITORING SCHEDULE OF THE REPORTING PERIOD	3
2.5	STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS	4
2.6	COMMUNITY LIAISON GROUP MEETING	5
2.7	SUMMARY OF NON-COMPLIANCE WITH THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS	6
3	ENVIRONMENTAL ISSUES AND ACTIONS	7
3.1	PREVIOUS ENVIRONMENTAL DEFICIENCIES AND FOLLOW-UP ACTIONS	7
3.2	DESCRIPTION OF ACTIONS TAKEN IN EVENT OF NON-COMPLIANCE AND DEFICIENCY REPORTING	8
3.3	IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS	8
3.4	EVENT AND ACTION PLANS	9
4	ENVIRONMENTAL MONITORING	10
5	REVIEW OF THE EM&A AND IMPACT ASSESSMENT PREDICTINS	13
6	FUTURE KEY ISSUES AND CONCLUSION	15
6.1	KEY ISSUES FOR THE NEXT REPORTING PERIOD	15
6.2	IMPACT PREDICTION FOR THE NEXT REPORTING PERIOD	15
6.3	WORKS AND MONITORING SCHEDULE FOR THE NEXT REPORTING PERIOD	15
6.4	CONCLUSION	15

LIST OF TABLES

Table 1.1	Contact Information
Table 2.1	Summary of Works Undertaken up to 30 th June 2008
Table 2.2	Cumulative Quantity of Excavated Materials up to 30 th June 2008
Table 2.2	Summary of Environmental Licensing, Notification and Permit Status up to 30 th June 2008
Table 3.1	Environmental Deficiencies (Observations) from Site Inspections during Reporting Period

Table 5.1 *Average Suspended Solids Concentrations (SS, mg/L) calculated from Baseline Monitoring and Monthly Average Values calculated from Impact Monitoring at Impact Stations during mid-ebb. Exceedance of EIA prediction was indicated in grey shaded cells.*

Table 5.2 *Average Suspended Solids Concentrations (SS, mg/L) calculated from Baseline Monitoring and Monthly Average Values calculated from Impact Monitoring at Impact Stations during mid-flood. Exceedance of EIA prediction was indicated in grey shaded cells.*

LIST OF ANNEXES

- Annex A Project Location
- Annex B Water Quality Monitoring Stations, Water Quality and Ecological Sensitive Receivers
- Annex C Cumulative Complaints Statistics
- Annex D Implementation Programme of Mitigation Measures
- Annex E Event and Action Plans
- Annex F Impact Water Quality Monitoring Results
- Annex G Dolphin Sighting Records

EXECUTIVE SUMMARY

After the resumption of the construction works and the EM&A requirements for the Permanent Aviation Fuel Facility on 9th July 2007, this is the **first** annual Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from **9th July 2007 to 30th June 2008** in accordance with the EM&A Manual.

Breaches of all Action and Limit Levels

Water quality monitoring during dredging activities, conducted from 17 December 2007 to 31 March 2008, recorded daily exceedance of Action Levels of Depth-averaged Turbidity during December, January and February with exception of 16 and 24 January, and 11 February.

There was exceedance of the Action Levels of Depth-averaged Suspended Solids (SS) on the 21, 24, 25, 27, 29 and 30 December, as well as exceedance of the SS Limit Levels on the 27, 29 and 30 December, 11, 23 and 29 January, and 10, 12, 13 and 24 February. Following a review of the data, a revised Action Limit Level for Turbidity was implemented on 1 March 2008. Only one exceedance of Limit Level of Depth-averaged Dissolved Oxygen was found (19 March 2008).

Following review of data in accordance with the procedures specified in the EM&A Manual, all exceedances were considered due to natural fluctuation from the Pearl River discharge rather than the Project Works.

Complaint Log

No environmental complaint was received during the reporting period.

Notifications of any Summons and Successful Prosecutions

No environmental summon or prosecutions was received in this reporting period.

Future Key Issues

- Dust release and suppression;
- Dredging activities; and,
- Water quality monitoring and dolphin monitoring during the dredging activities.

Conclusion

The overall water quality at the vicinity of the project area was found to be similar to that collected during the baseline monitoring conducted prior to the commencement of the Project works. No deterioration of water quality has been observed and all change appears to be as a result of natural fluctuation or

seasonal variation. This implies the impact of the project works on the water quality at the Project sites is negligible.

Leighton Contractors (Asia) Limited (LCAL) has appointed ERM-Hong Kong, Limited (ERM) as the Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme for the Permanent Aviation Fuel Facility (the Project) during construction works.

The construction works for PAFF commenced in November 2005 based upon the previous EIA (EIAO Register Number *AEIAR-062-2002*) conducted and the Environmental Permit EP-139/2002 granted on the 28th August 2002. Due to minor changes to the detailed layout of the site and the site boundary, application for Variation to the Environmental Permit (VEP) (*VEP-133/2004*) was submitted to the Director of Environmental Protection (DEP) for approval. The variation to the EP (*EP-139/2002/A*) was granted by EPD in February 2004.

However, the decision by EPD to grant the above Environmental Permit was subject to a Judicial Review. The Judicial Review sided in the favour of the DEP, as did the subsequent Judgement from the Court of Appeal from the High Court for Judicial Review in March 2005. However, the DEP's decision to grant the EP was quashed by the Judgement of the Court of Final Appeal of July 2006.

The construction works were stopped following the Judgement of the Court of Final Appeal of July 2006. As such, in order to continue with the construction of the project, the project went through the statutory procedures under the EIAO again with a new design in order to obtain an environmental permit. The revised EIA was submitted in 2007 and the environmental permit (*EP-262/2007*) was granted in May 2007. *EP-262/2007* has been amended to *EP262/2007/A* and issued by the EPD on 30 November 2007.

It should be noted that at the time of reporting, a further Variation to the Environmental Permit has been approved, primarily to allow for dredging works to continue during March 2008. As such, *EP-262/2007/A* has been amended to *EP-262/2007/B* and issued by the EPD on 27 February 2008.

The construction works and EM&A requirements resumed on 9th July 2007 following the latest requirements of the *EP-262/2007/B* and *EM&A Manual*. Details regarding the EM&A requirements and changes should refer to the updated EM&A Manual. For the marine works, all piling activities were completed before the previous suspension of construction works in 2006.

1.1

PURPOSE OF THE REPORT

After the resumption of the construction works and EM&A requirements on 9th July 2007, this is the **first** EM&A Report which summarizes the monitoring results and audit findings for the EM&A programme during the reporting period from **1st July 2007 to 30th June 2008**.

Key contact information of the Project is presented in *Table 1.1*.

Table 1.1 *Contact Information*

Name	Position	Telephone	Facsimile	E-mail
Airport Authority Hong Kong - Environmental Permit Holder				
Mr Amin	Assistant	2183 3108	2824 2786	ebraa@hkairport.com
Ebrahim	General Manager Aviation Logistics			
Contractor - Leighton (Asia) Construction Limited				
Brian	Project	2823 1111	2529 8784	brian.gillon@leightonasia.com
Gillon	Director			
Franchisee's Site Representative - ECO Aviation Fuel Development Limited				
Philip Siu	Franchisee's Site Representative	2963 2820	2563 6311	philip.siu@towngas.com
Environmental Team - ERM-Hong Kong Limited				
Craig Reid	Environmental Team Leader	2271 3000	2723 5660	craig.reid@erm.com
Independent Environmental Checker - Hyder Consulting Limited				
Dr Kwok- leung Pun	Independent Environmental Checker	2911 2233	2805 5028	KwokLeung.Pun@hyderconsulting.com

2 ENVIRONMENTAL STATUS

2.1 PROJECT AREA

The project area is in Area 38 of Tuen Mun and the pipelines are located in Urmston Road between Tuen Mun Area 38 and Sha Chau. The site is illustrated in *Annex A*.

2.2 ENVIRONMENTAL SENSITIVE RECEIVERS

No air and noise sensitive receivers were identified close to the project area. However, water sensitive receivers and ecological sensitive receivers were identified in the EIA study, and are shown in *Annex B*.

2.3 MAJOR CONSTRUCTION ACTIVITIES

A summary of the major works undertaken in this reporting period is shown in *Table 2.1*. *Table 2.2* presented the cumulative quantity of excavated materials up to 30th June 2008. The cumulative dredging volume during the reporting period was presented in *Figure 2.1*.

Table 2.1 Summary of Works Undertaken up to 30th June 2008

Area	Works undertaken
Tuen Mun Area 38	Tank Farm and Bund Wall Construction Permanent Drainage Construction Operational & Fire Services Buildings Construction Minor Jetty Works (Non-piling) Site Investigation
Submarine Pipeline Route	Dredging Operations

Table 2.2 Cumulative Quantity of Excavated Materials up to 30th June 2008

Type of Excavated Materials	Cumulative Bulk Volume (m ³)
Contaminated Mud	105,974
Uncontaminated Mud	97,815

2.4 MONITORING SCHEDULE OF THE REPORTING PERIOD

Daily water quality monitoring and dolphin monitoring, and biweekly Persistent Organic Pollutants (POPs) monitoring during dredging activities were conducted from on 17 December 2007 to 31 March 2008. A marine archaeological Watching Brief of two sub-surface anomalies was also implemented from 21 to 28 February 2008 during the dredging of the surrounding seabed located within the route of the twin pipelines from the PAFF tank farm at Tuen Mun Area 38 to Sha Chau.

A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project since July 2007 is presented in *Table 2.2*.

Table 2.2 *Summary of Environmental Licensing, Notification and Permit Status up to 30th June 2008*

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
Environmental Permit	<i>EP-262/2007/B</i>	Throughout Project	Issued on 27 February 2008 (<i>EP-262/2007/A</i> on 30 November 2007, <i>EP-262/2007</i> issued on 31 May 2007, <i>EP-139/2002</i> originally granted on 28 August 2002 and <i>EP-139/2002/A</i> granted on 24 February 2004 were superseded)
Chemical Waste Producer Registration	<i>WPN 5111-421-L2174-25</i>	Throughout Project	Issued on 10 November 2005
Notification of Construction Works under Air Pollution Control (Construction Dust) Regulation	<i>H2104/U1D/5542/DG/DH/PL</i>	Throughout Project	Notification on 6 July 2007
Construction Noise Permit	<i>GW-RW0372-07</i>	25 July 2007 to 24 January 2008	For air compressors, breakers, excavators, wheeled loaders, mobile cranes, concrete lorry mixers, hand-held pokers, bar benders/cutters, wood saws, grinders, submarine water pump, lorries with crane, dump trucks, rollers, ventilation fans and generators
	<i>GW-RW0427-07</i>	28 August 2007 to 27 February 2008	For concrete pump derrick barges, hand-held grinders, generators, air compressors, boring machines, water pumps, tug boat, grout mixers and grout pumps

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
	GW-RW0676-07	21 December 2007 to 19 June 2008	For land-based works including air compressors, breakers, excavators, wheeled loaders, mobile cranes, concrete lorry mixers, hand-held pokers, bar benders/cutters, wood saws, grinders, submarine water pump, lorries with crane, dump trucks, rollers, ventilation fans and generators
	GW-RW0677-07	21 December 2007 to 29 February 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan
	GW-RW0678-07	21 December 2007 to 18 June 2008	For marine jetty works including concrete pump derrick barges, hand-held grinders, generators, air compressors, boring machines, water pumps, tug boat, grout mixers and grout pumps
	GW-RW0094-08	1 March to 31 March 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan
Marine Dumping Permit	EP/MD/08-064	13 December 2007 to 29 February 2008	For Type 1 – Open Sea Disposal
	EP/MD/08-065	13 December 2007 to 12 January 2008	For Type 1d & Type 2 marine disposal
	EP/MD/08-071	13 January 2008 to 12 February 2008	For Type 1d & Type 2 marine disposal
	EP/MD/08-090	3 March to 31 March 2008	For Type 1d & Type 2 marine disposal
	EP/MD/08-091	3 March to 31 March 2008	For Type 1 – Open Sea Disposal
Wastewater Discharge License	EP760/421/011399/I	15 March 2006 to 31 March 2011	Issued on 15 March 2006

2.6

COMMUNITY LIAISON GROUP MEETING

According to the EP requirements, a Community Liaison Group (CLG) shall be established within three months after commencement of construction of the

Project. The major duty of CLG is to advise on and monitor the proper design, construction and operation of the Project. The CLG comprises representatives from Airport Authority, members of Tuen Mun community and academics. Up to 30 June 2008, the CLG held the meetings on 27 July 2007, 5 October 2007, 7 December 2007, 7 March 2008 and 6 June 2008.

The details of PAFF CLG (including Membership and its Terms of Reference) and the meeting minutes can be found on the Project website (<http://www.paffhk.com>).

2.7 **SUMMARY OF NON-COMPLIANCE WITH THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS**

Summary of Environmental Non-compliance

Water quality monitoring during dredging activities recorded daily exceedance of Action Levels of Depth-averaged Turbidity during December, January and February with exception of 16 and 24 January, and 11 February.

There was exceedance of the Action Levels of Depth-averaged Suspended Solids (SS) on the 21, 24, 25, 27, 29 and 30 December, and exceedance of the SS Limit Levels on the 27, 29 and 30 December, 11, 23 and 29 January, and 10, 12, 13 and 24 February.

Following a review of the data, a revised Action Limit Level for Turbidity was implemented on 1 March 2008. Only one exceedance of Limit Level of Depth-averaged Dissolved Oxygen was found (19 March 2008).

A description of the actions taken following these non-compliances is discussed in *Section 3.2*.

Summary of Environmental Complaints

No environmental complaint was received during the reporting period. A summary of environmental complaints since project commencement is presented in *Annex C*.

Summary of Environmental Summons

No summons was received in this reporting period. A summary of legal proceeding since project commencement is presented in *Annex C*.

3.1 PREVIOUS ENVIRONMENTAL DEFICIENCIES AND FOLLOW-UP ACTIONS

As no environmental complaint was received during the last reporting period, no follow-up action has been required.

Weekly site inspections were carried out during the reporting period. Overall, the site was in good orderly manner and no non-compliance was found. Environmental deficiencies and follow-up actions/mitigation measures were identified during the inspections are presented in previous *Monthly EM&A Reports*. Key findings are summarised in *Table 3.1*.

Table 3.1 *Environmental Deficiencies (Observations) from Site Inspections during Reporting Period*

Key Observations	Follow-up Action
Construction materials at the stockpile area were observed to be loaded without spraying with water	Site workers were deployed to spray water on the construction material during loading and unloading
Sediment plumes were observed at the outfall of the temporary drainage system after a rainstorm	The temporary drainage system was upgraded with the installation geo-textile on the sediment tank
Ponding of rainwater was observed in the construction site	Rainwater was pumped offsite via the temporary drainage system
Chemical waste stores were observed to be full	The chemical waste was disposed of via licence chemical waste collector
Excavated materials were not properly covered with tarpaulin sheets to avoid dust generation	The sand pile was covered accordingly
General refuse collection bins were observed to be full outside the site office and operation building	General refuse was cleared
Piles of general and wood waste from construction works were piled up on open areas without proper containers	A suitable waste bin was installed and the refuses were cleared
Oil sheens were observed on ground due to improper storage of equipment and chemicals	Contractor stored equipment and chemicals in suitable containers to avoid leakages
Sediment plumes were observed in the marine area near the water discharge outlet	Contractor cleared sedimentation tank and car wash facility to avoid overflow of silt and dirt

Overall, the site was in a good orderly manner. The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

3.2 *DESCRIPTION OF ACTIONS TAKEN IN EVENT OF NON-COMPLIANCE AND DEFICIENCY REPORTING*

Although dredging operations were undertaken during the reporting period, the exceedances were unlikely to be caused by the Project and were considered to be an isolated case due to the following reasons:

- Exceedance of Action Level of depth-averaged Turbidity was found on days when no dredging was undertaken, and these values were comparable to those days with dredging operations
- Depth-averaged DO, bottom DO and depth-averaged SS did not show the same trend of exceedance

As per the requirements of the EM&A Manual, incidents were notified to the Franchisee's Site Representative, the Contractor and the Independent Environmental Checker upon identification of an exceedance.

The temporal and spatial trend of the results collected during the impact monitoring have been plotted against those collected during the baseline monitoring and are discussed below. Results are illustrated in *Annex F*.

Results showed that during impact monitoring on both ebb and flood tides, turbidity and SS levels at all stations are generally comparable with those levels recorded during the baseline monitoring. It was thus considered likely that the waters upstream of the works site are influenced by other factors, such as natural fluctuations of turbidity and SS observed in the Pearl River Estuary.

3.2.1 *Follow-up Action following Non-Compliance*

In accordance with the required procedures specified in the *EM&A Manual* to be taken following the trigger of an Action Level, discussions between the Environmental Team (ET) and the Independent Environmental Checker (IEC) resulted in an amendment made to the Action Level for the monitoring of Turbidity for the Project, such that the Action Level of Turbidity be amended to follow the same principle as that currently applied to DO and SS. This amendment was introduced on 1 March 2008, following the submission of the revised *Final Baseline Monitoring Report* for water quality to the EPD on 20 February 2008 and later under the EIAO register on 29 February 2008. As such, the compliance of depth-averaged Turbidity from that date onwards was checked against the revised Action Levels. The development of the amendment is documented in the previous *Monthly EM&A Reports*.

3.3 *IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS*

The implementation status of environmental mitigation measures and requirements as stated in the *EIA Report*, *Environmental Permits* and *EM&A Manual* during the reporting period is summarized in *Annex D*.

3.4

EVENT AND ACTION PLANS

The event and action plans for construction noise, water quality monitoring, dolphin monitoring, cultural heritage, landscape and visual, as stated in the *EM&A Manual*, are summarized in *Annex E*.

4.1.1 *Air and Noise*

Air and Noise monitoring was not required for the project.

4.1.2 *Water Quality*

In accordance to the EM&A Manual, water quality monitoring was conducted during dredging activities from 17 December 2007 to 31st March 2008. Monitoring data and graphical presentations of the results are included in *Annex F*.

Results of the monitoring demonstrated that all measured dissolved oxygen levels of all Impact Stations were compliant with the Action and Limit (AL) Levels specified in the *EM&A Manual* with the exception of 19 March 2008. Concentrations of Suspended Solids (SS) were generally below AL Levels, however, exceedances were noted for 21, 24, 25, 27, 29 and 30 December 2007, 11, 23 and 29 January, and 10, 12, 13 and 24 February. Turbidity levels were, however, above Action Levels on a daily basis on December, January and February with exception of 16 and 24 January, and 11 February. A review of the above exceedances concluded that these were not attributable to Project works and were likely due to natural variation (see *Section 3.2* for further details).

Biweekly monitoring of water samples was also conducted for POPs analysis from 17 December 2007 to 31 March 2008. All POPs parameters (ie total Polychlorinated Biphenyls (PCBs), total Dichloro-Diphenyl-Trichloroethane (DDTs) and total Polycyclic Aromatic Hydrocarbons (PAHs)) were below detection limits, except the total PAHs of Control Station C1 during mid-flood tidal condition. As C1 is a Control Station, such levels were not considered to be attributable to works. Monitoring results and QA/QC reports for POPs testing are presented in previous *Monthly Monitoring Reports*.

4.1.3 *Waste Management*

The Contractor's revised Waste Management Plan (Revision 4) (WMP) was submitted to EPD on 20 September 2007. Pursuant to *EP Condition 3.3*, the Contractor submitted the updated and revised WMP (Revision 5) to the ET on 3 June 2008. The ET reviewed the WMP and offered comments to the Contractor on 16 June 2008. Response to comment (RTC) from the Contractor is now in progress.

4.1.4 *Cultural Heritage*

In accordance with the *EM&A Manual*, a marine archaeological Watching Brief of two sub-surface anomalies was implemented from 21 to 28 February 2008 during the dredging of the surrounding seabed located within the route of the twin pipelines from the PAFF tank farm at Tuen Mun Area 38 to Sha Chau.

No archaeological sites or relics were found and it was considered by the licensed Marine Archaeologist that the anomalies have no cultural heritage significance. No additional mitigation measures were thus required to be implemented by the PAFF project in regard to the anomalies SS1 and SS2.

The *Watching Brief Report*, verified by the Independent Environmental Checker, was submitted to the EPD and AMO on 9 May 2008.

4.1.5 *Landscape and Visual*

According to the *EIA Report* and *EM&A Manual*, mitigation measures and site inspection are required during the landscaping/planting works. The berm/landscaping bund was dominated by vegetation which was grown during the project suspension period.

The weekly site inspections included audits on landscape and visual issues to ensure that the site was in orderly acceptable manner.

4.1.6 *Land Contamination, Hazard to Life and Fuel Spill Risk*

According to the *EIA Report* and *EM&A Manual*, mitigation measures and design phase audit are required to minimise the risk of fuel spill and hazards. The Contractor will submit the updated design audit plan according to the EP requirements.

Pursuant to *Condition 3.5* of the EP, the Contractor submitted two design drawings entitled Fencing and Security Wall Layout Plan (*PAFF/LC/02/DWG/C/0176 Revision A*) and Fencing and Security Wall Section (*PAFF/LC/02/DWG/C/0177 Revision A*) to the ET for certification on 30th July 2007. The ET reviewed the drawings and offered comment on the design of the security walls and bund walls, taking into account of *Condition 3.5a* of the EP, to the Contractor on 31st August 2007. Response to comment (RTC) from the Contractor was received by the ET on 19th September 2007.

Weekly site inspection covered the waste management aspects which included measures to prevent land contamination by chemical wastes.

4.1.7 *Ecology*

Dolphin Visual Monitoring

In accordance to *EM&A Manual*, dolphin monitoring has been undertaken during dredging activities from 17 December 2007 to 31 March 2008.

During the reporting period, 23 dolphin sightings were recorded. Appropriate action was taken in accordance with the *EM&A Manual*. The sighting locations and field records are presented in *Annex G*.

4.1.8 *EM&A Manual*

The *EM&A Manual* for the Project has been updated by the ET to include the detailed arrangements of setting up a Community Liaison Group, carrying out design audit, and POPs monitoring during construction of the Project. The updated *EM&A Manual* was revised accordingly to the comments received from the EPD on 6 December 2007 and was submitted to the EPD on 10 December 2007. Comments were received from the EPD on 22 January 2008. The ET will update the *EM&A Manual* accordingly.

4.1.9 *Baseline Water Quality Monitoring*

Baseline water quality monitoring was conducted between 24 October and 30 October 2007 at six designated monitoring stations (three impact stations and three control stations) established for the Project in accordance with the *EM&A Manual*. The *Final Baseline Monitoring Report* was submitted to the EPD on 21 November and comments were received from the EPD on 6 December. A revised *Final Baseline Monitoring Report* was submitted to the EPD on 20 February 2008 with no further comments received and later placed under the *EIAO* register.

Dredging operation was carried out for pipeline installation during the period of 21 to 22 January 2008. Monitoring data of suspended solids (SS) concentrations collected are compared with the impact assessment predictions in the *EIA Report*. As stated in the *EIA report*, the predicted allowable maximum contribution on suspended sediment concentration from dredging activity will be 30% increase of the background concentration. Tables 5.1 and 5.2 show the comparison between the monthly mean value of the impact monitoring data and the average values of the baseline monitoring.

Table 5.1 *Average Suspended Solids Concentrations (SS, mg/L) calculated from Baseline Monitoring and Monthly Average Values calculated from Impact Monitoring at Impact Stations during mid-ebb. Exceedance of EIA prediction was indicated in grey shaded cells.*

Stations	Suspended Solid Concentrations (mg/L)					
	Baseline monitoring (Average)	EIA Prediction (Baseline values x 130%)	Impact Monitoring (Average)			
			Dec 07	Jan 08	Feb 08	March 08
MPB1	13.76	17.89	16.96	9.08	10.84	8.25
MPB2	14.57	18.94	11.72	9.38	9.92	7.74
MP	13.33	17.33	12.21	8.50	11.61	8.09
IMO1*	11.81	15.35	11.66	8.80	8.57	7.49
IMO2*	11.81	15.35	10.36	8.24	8.70	7.15
IMO3*	11.81	15.35	-	8.27	9.73	-
IMO4*	11.81	15.35	-	7.37	8.28	-

*Note: baseline monitoring was not applicable to these stations and hence data was compared against the average value of all baseline monitoring data.

Table 5.2 *Average Suspended Solids Concentrations (SS, mg/L) calculated from Baseline Monitoring and Monthly Average Values calculated from Impact Monitoring at Impact Stations during mid-flood. Exceedance of EIA prediction was indicated in grey shaded cells.*

Stations	Suspended Solid Concentrations (mg/L)					
	Baseline monitoring (Average)	EIA Prediction (Baseline values x 130%)	Impact Monitoring (Average)			
			Dec 07	Jan 08	Feb 08	March 08
MPB1	13.50	17.55	22.06	11.55	10.91	8.61
MPB2	18.31	23.80	11.76	9.56	11.39	8.15
MP	10.86	14.11	13.54	8.02	11.51	7.96
IMO1*	13.21	17.17	12.54	9.61	9.21	7.57
IMO2*	13.21	17.17	12.93	9.39	8.99	6.93
IMO3*	13.21	17.17	-	8.10	9.41	-
IMO4*	13.21	17.17	-	6.83	8.43	-

*Note: baseline monitoring was not applicable to these stations and hence data was compared against the average value of all baseline monitoring data.

During the reporting period, monthly average of measured elevations of SS at the monitoring stations during mid-ebb did not exceed 130% of the baseline levels, which was in line with previous predictions. During mid-flood tidal

condition, the measured elevations of SS at Impact Station MPB1 in December, however, exceeded the predictions. Such exceedance is more likely due to natural fluctuations of SS observed in the Pearl River Estuary. Moreover, all SS levels recorded at all impact stations in January, February and March 2008 did not exceed the predictions, which can further imply that such exceedance is unlikely due to the project works.

6 *FUTURE KEY ISSUES AND CONCLUSION*

6.1 *KEY ISSUES FOR THE NEXT REPORTING PERIOD*

It should be noted that dredging activities have been suspended from 1 April onwards and are tentatively scheduled to resume in September 2008. As such, key issues to be considered in the next reporting period will be:

- Dust release and suppression from on-site works;
- Dredging activities; and.
- Water quality monitoring and dolphin monitoring during dredging activities.

6.2 *IMPACT PREDICTION FOR THE NEXT REPORTING PERIOD*

Provided that environmental mitigation measures including good on-site practises are properly implemented, it is not expected that unacceptable adverse impact will arise.

6.3 *WORKS AND MONITORING SCHEDULE FOR THE NEXT REPORTING PERIOD*

Work programme for the next reporting period includes jetty platform works (non-piling), site works (construction works for tank farm, operational and fire services buildings, drainages, bund wall, security wall etc) and dredging operation. Weekly site inspections will be undertaken by the ET as per the EM&A requirements.

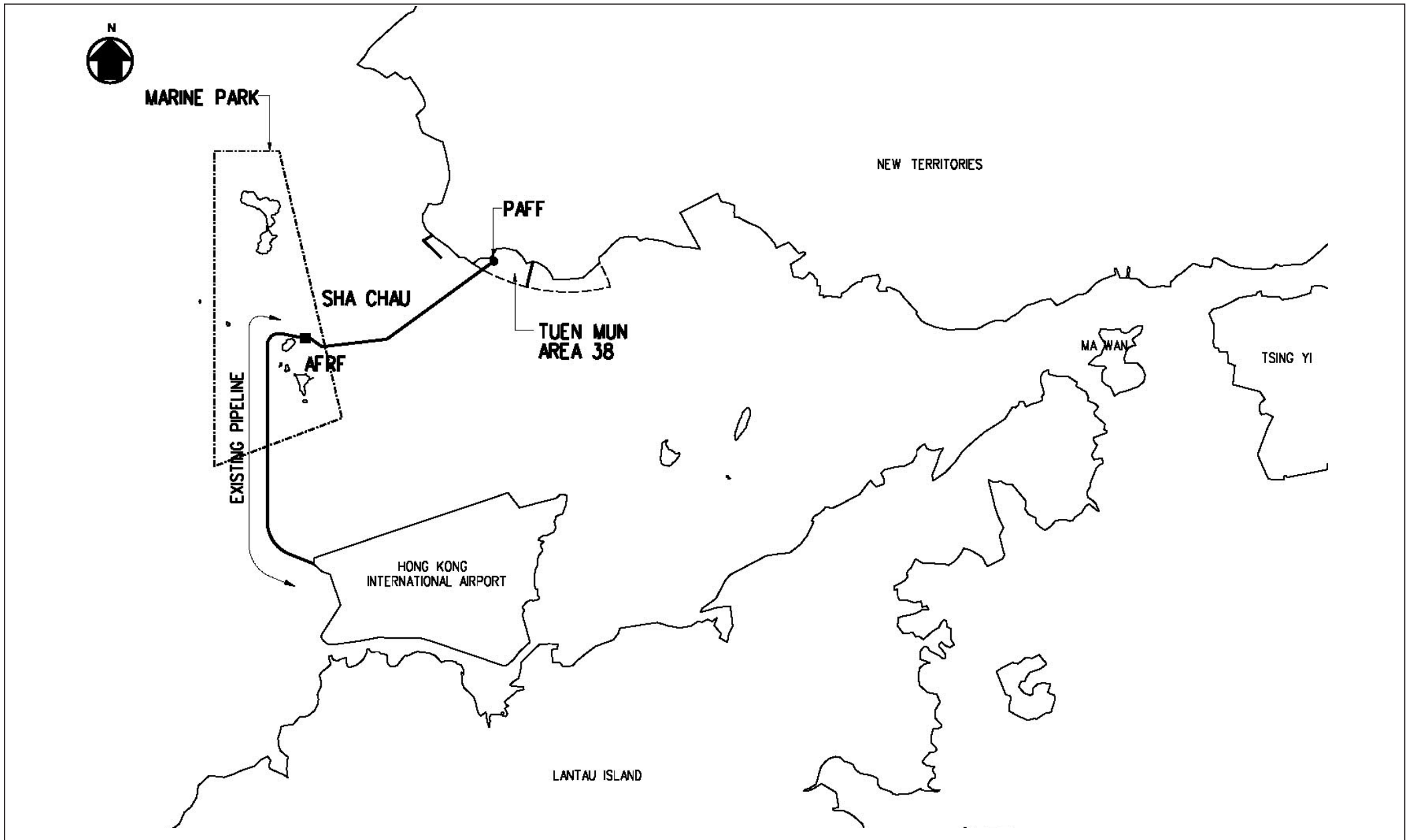
6.4 *CONCLUSION*

The EM&A works were conducted throughout the annual reporting period and the relevant monitoring was conducted in accordance with the EP's requirements. Mitigation measures were used to minimise the environmental impacts, where appropriate. Some environmental deficiencies were observed during the site inspections and the Contractor implemented corrective action to mitigate the issues. Overall, the site was considered to be in an orderly manner.

It is concluded the current EM&A programme, including the monitoring programme and the mitigation measure herein, is sufficient to monitor the environmental performance of the project works.

Annex A

Project Location



Annex A

Location of PAFF

FILE: 0018105bb1
DATE: 12/11/2007






Environmental
Resources
Management



Annex B

Water Quality Monitoring
Stations, Water Quality and
Ecological Sensitive
Receivers

KEY

-  Control Stations
-  Impact Stations
-  Marine Park
-  Proposed Pipeline
-  Potential IMO1 & IMO2 Monitoring Zone

Marine Park
(Water Sensitive Receiver)

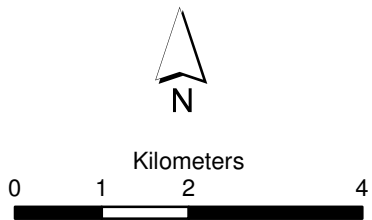
C2 (NM5)

C1 (NM3)

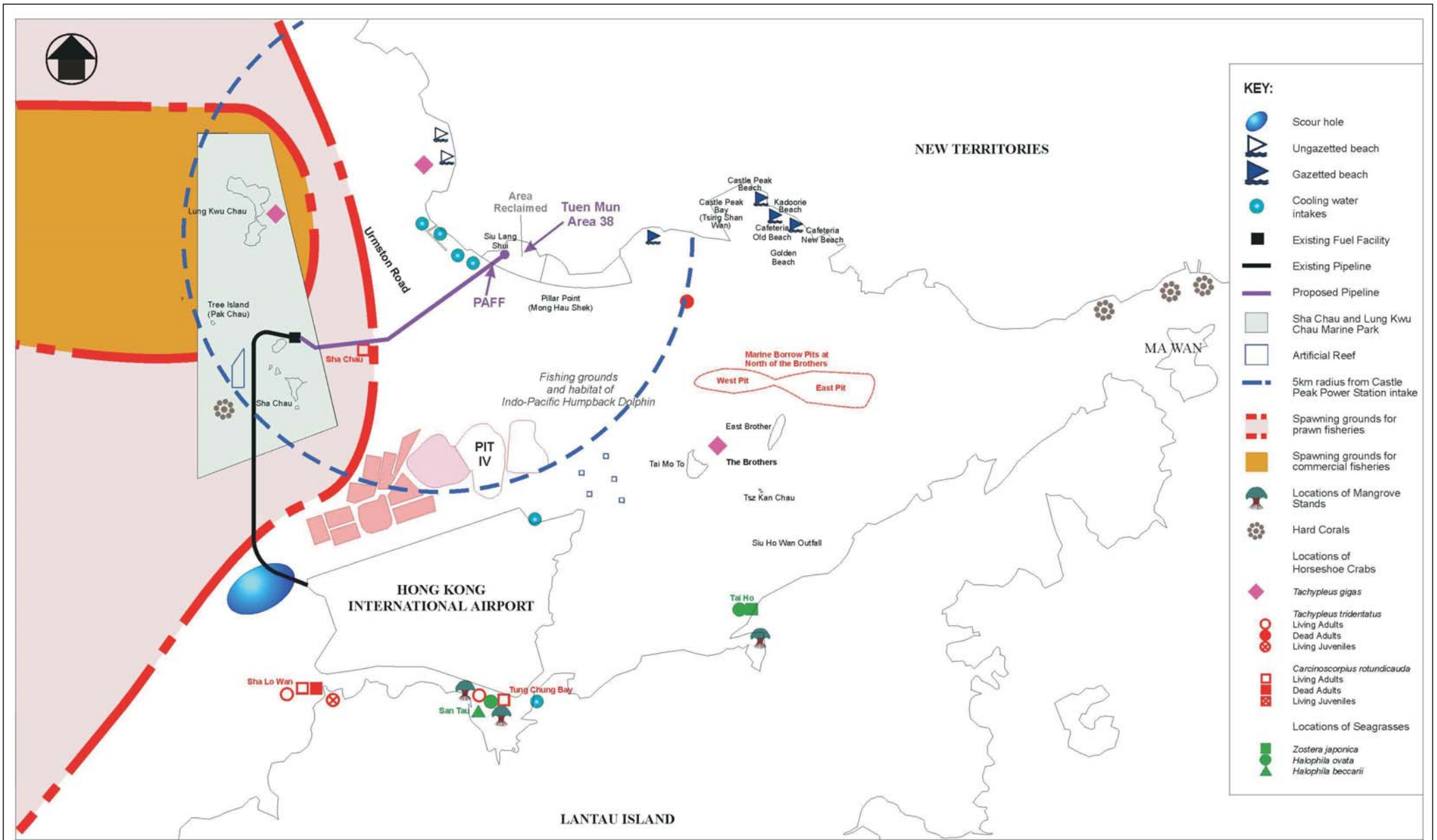
MPB1

MPB2

C3 (NM6)



Water Sensitive Receiver and Water Quality Monitoring Locations



Annex B

Water Quality and Ecological Sensitive Receivers

FILE: C2475aa
DATE: 12/11/2007

(Source : PAFF for Hong Kong International Airport EIA, Mouchel 2002)

Environmental
Resources
Management



Annex C

Cumulative Complaints Statistics

Summary of Environmental Complaints

Reporting Period	Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
Before construction works	1	1	Dust
18/11/05 - 15/12/05	1	2	Dust
15/12/05 - 14/01/06	0	2	Nil
15/01/06 - 14/02/06	0	2	Nil
15/02/06 - 14/03/06	0	2	Nil
15/03/06 - 14/04/06	0	2	Nil
15/04/06 - 14/05/06	0	2	Nil
15/05/06 - 14/06/06	0	2	Nil
15/06/06 - 14/07/06	0	2	Nil

Re-commencement of construction works on 9th July 2007

09/07/07 - 31/07/07	0	2	Nil
01/08/07 - 31/08/07	0	2	Nil
01/09/07 - 30/09/07	0	2	Nil
01/10/07 - 31/10/07	0	2	Nil
01/11/07 - 30/11/07	0	2	Nil
01/12/07 - 31/12/07	0	2	Nil
01/01/08 - 31/01/08	0	2	Nil
01/02/08 - 29/02/08	0	2	Nil
01/03/08 - 31/03/08	0	2	Nil
01/04/08 - 30/04/08	0	2	Nil
01/05/08 - 31/05/08	0	2	Nil
01/06/08 - 30/06/08	0	2	Nil

Summary of Environmental Summons

Reporting Period	Environmental Summons		
	Frequency	Cumulative	Summon Nature
18/11/05 - 15/12/05	0	0	Nil
16/12/05 - 14/01/06	0	0	Nil
15/01/06 - 14/02/06	0	0	Nil
15/02/06 - 14/03/06	0	0	Nil
15/03/06 - 14/04/06	0	0	Nil
15/04/06 - 14/05/06	0	0	Nil
15/05/06 - 14/06/06	0	0	Nil
15/06/06 - 14/07/06	0	0	Nil

Re-commencement of construction works on 9th July 2007

09/07/07 - 31/07/07	0	0	Nil
01/08/07 - 31/08/07	0	0	Nil
01/09/07 - 30/09/07	0	0	Nil
01/10/07 - 31/10/07	0	0	Nil
01/11/07 - 30/11/07	0	0	Nil
01/12/07 - 31/12/07	0	0	Nil
01/01/08 - 31/01/08	0	0	Nil
01/02/08 - 29/02/08	0	0	Nil

Reporting Period	Environmental Summons		
01/03/08 - 31/03/08	0	0	Nil
01/04/08 - 30/04/08	0	0	Nil
01/05/08 - 31/05/08	0	0	Nil
01/06/08 - 30/06/08	0	0	Nil

Annex D

Implementation
Programme of Mitigation
Measures

ANNEX D IMPLEMENTATION SCHEDULE

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
Water Quality										
6.7	6.8.1	There should be no access to the shore or working from land within the Marine Park. No marine anchors shall be used within the Marine Park.	Marine Park / Pipeline Dredging	Contractor	TMEIA		Y		N/A	On going
6.7	6.8.1	No hydraulic dredging within Marine Park.	Marine Park / Pipeline Dredging	Contractor	TMEIA		Y		N/A	Completed
6.7	6.8.1	Dredging for pipeline trench should be timed to coincide with maintenance dredging for Sha Chau AFRF marine access channel if relevant.	Sha Chau AFRF Marine access channel	Airport Authority	TMEIA		Y		N/A	On going
6.4		The work rate for dredging should not exceed 4,000 m ³ /hr for the TSHD and 7,000 m ³ /day for the grab dredger.	Marine Park / Pipeline Dredging	Contractor	TMEIA		Y		N/A	On going
6.7	6.8.1	Standard good dredging practice measures shall be written in the dredging contract.	Marine Park / Pipeline Dredging	Franchisee	TMEIA		Y		N/A	On going
6.7	6.8.1	Use of Lean Material Overboard (LMOB) systems shall be prohibited. No mud overflow is to be permitted for dredging using TSHD.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions		Y		N/A	Not applicable
6.7	6.8.1	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions		Y		N/A	On going
6.7	6.8.1	Barges and hopper dredgers shall have tight fittings seals to their bottom openings to prevent leakage of material.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions		Y		N/A	On going

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	6.8.1	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	Not applicable
6.7	6.8.1	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	On going
6.7	6.8.1	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	On going
6.7	6.8.1	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	On going
6.7	6.8.1	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	On going
6.7	6.8.1	The works shall not cause foam, oil, grease, letter or other objectionable matter to be present in the water within and adjacent to the works site.	Dredged areas/ Pipeline Dredging	Contractor	TMEIA Marine Fill Committee Guidelines. DASO permit conditions	Y			N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	6.8.1	Placement of pipeline trench backfill should be undertaken in a controlled manner to minimise impacts. Backfilling with rock should be undertaken either down pipe or by a reverse grab operation or other controlled technique to ensure that this material does not mound on the seabed	Pipeline trench/ Pipeline Dredging	Contractor	TMEIA Minimise disturbance		Y		N/A	Pending
6.7	6.8.1	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Storm drainage should be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sandbag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	6.8.1	Temporary access roads should be surfaced with crushed stone or gravel.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	6.8.1	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	The section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	The contractors shall prepare oil/chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	6.8.1	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	Land site/ Throughout construction period	Contractor	TMEIA ProPECC Note 1/94. WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	6.8.1	Wastewater from pipe commissioning dewatering exercises shall be stored on site and for chemical analysis and safe disposal in accordance with the WPCO.	Tank Farm/Tank farm commissioning	Franchisee	TMEIA WPCO TM on Effluent Standards		Y		N/A	Ongoing
6.7	Section 6	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	Land site/ Throughout construction period	Contractor	EM&A Manual		Y		N/A	Ongoing
6.7	Section 6	Submarine section of aviation fuel pipeline shall be covered with rock armour protection which shall not protrude above the level of the adjacent natural seabed.	Submarine pipeline	Franchisee	TMEIA Rock armour to minimum thickness of 1m	Y	Y		Franchisee	On going
6.7	Section 6	Detailed emergency response procedures shall be drawn up. These will include requirements to maintain floating oil booms, absorbent materials and skimmers on site at all times.	All facilities	Franchisee	TMEIA Industry Standards e.g. Oil Companies International Marine Forum			Y	Franchisee	Pending

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.7	Section 6	Coupling points on the jetty will be protected with slop collection utilities.	Jetty	Franchisee	TMEIA Rock armour to minimum thickness of 1m	Y			Franchisee	On going
6.7	Section 6	Auxiliary tanks shall be permanently maintained at the tank farm for recovered fuel and slops.	Tank farm	Franchisee	TMEIA			Y	Franchisee	Pending
6.7	Section 6	Oily drainage systems and slop collection systems will connect to an oil/water separator.	Tank farm	Franchisee	TMEIA Industry Standards e.g. Oil Companies International Marine Forum		Y		Franchisee	On going
6.7	Section 6	All tanks shall be bunded to a capacity of at least 150% of the largest individual tank in each compound by 2040. Tank pits shall be protected by an impermeable bed (e.g. geotextile sheeting) to prevent seepage of aviation fuel to ground. A leak detection system shall be installed beneath the containment membrane.	Tank farm	Franchisee	TMEIA Hong Kong Code of Practice for Oil Installations, 1992		Y		Franchisee	On going
6.7	Section 6	There shall be no direct outlet from the bund. A collection pump shall be included in the base. Removal of accumulated rainwater shall be activated manually and discharged to storm drain via an oil/water separator.	Tank farm	Franchisee	TMEIA		Y		Franchisee	On going
6.7	Section 6	Contingency procedures shall be drawn up to ensure containment and safe disposal of any fuel lost from tanks or pipework. Suitable absorbent materials (e.g. sand or earth) shall be kept on site to deal with spillages.	Tank farm	Franchisee	TMEIA Hong Kong Code of Practice for Oil Installations, 1992			Y	Franchisee	Pending
6.7	Section 6	Valves shall be installed within the storm drainage system to facilitate the retention of spillages.	Tank farm	Franchisee	TMEIA		Y		Franchisee	On going

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
6.10	Section 6	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen.	Design monitoring stations as defined in EM&A Manual, section 6. Construction period when dredging takes place within 1000m of Marine Park and along entire length of the pipeline	Contractor	EM&A Manual		Y		N/A	Ongoing
6.10	Section 6	Routine water quality monitoring in the vicinity of the PAFF site to check the effectiveness of the proposed precautionary measures implemented for on-site spill control. The details of the monitoring to be undertaken will be prepared by the Franchisee as part of the PAFF Operations Manual and the details will be agreed with the relevant authorities within 3 months of the commencement of operation of the PAFF. Monitoring should include but not be limited to the parameters of TPH and PAH and reference should be made to the existing monitoring programme undertaken for the fuel tank farm on the HKIA platform.	Operational phase. Location and frequency to be determined and agreed with relevant authorities	Franchisee	EM&A Manual			Y	N/A	Pending
Ecology 7.8	5.3	Undertake post construction dolphin abundance monitoring.	Construction	Contractor	TMEIA		Y		N/A	Pending

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
7.8	5.3	A 250m dolphin exclusion zone shall be implemented and dredging shall not begin until the observer has confirmed that the area has been clear for 30 minutes.	250m around dredger/throughout dredging in Marine Park and along the length of pipeline	Contractor	TMEIA		Y		N/A	Ongoing
7.8	5.3	Avoidance of dolphin main calving season between March and August.	Throughout dredging in Marine Park and along the length of the pipeline	Contractor	TMEIA		Y		N/A	Ongoing
Landscape & Visual										
8.10	7.2.1	The construction programme for the PAFF should be reduced to the shortest possible period.	PAFF site / throughout construction period	Contractor	TMEIA	Y	Y		N/A	Ongoing
8.10	7.2.1	The extent and periphery of the works areas should be managed so that they are as small as possible and do not appear cluttered, untidy and unattractive, particularly to road traffic along Lung Mun Road.	PAFF site / throughout construction period	Contractor	TMEIA		Y	Y	N/A	Ongoing
8.10	7.2.1	Temporary hoarding barriers should be of a recessive visual appearance in both colour and form.	PAFF site / throughout construction period	Contractor	TMEIA	Y	Y		N/A	Ongoing
8.10	7.2.1	Materials should be stored in areas with the least obstruction to residents, pedestrians and traffic.	PAFF site / throughout construction period	Contractor	TMEIA		Y	Y	N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
8.10	7.2.1	All material stockpiles should be covered with an impermeable material and sandbagging diversions should be placed around exposed soil.	PAFF site / throughout construction period	Contractor	TMEIA		Y	Y	N/A	Ongoing
8.10	7.2.1	Conservation of existing and imported soil resources.	PAFF site / throughout construction period of fuel tank expansion	Contractor	TMEIA			Y	N/A	Ongoing
8.10	7.2.1	A landscape perimeter bund comprising containment bund-wall, access road and planting buffer shall be built and maintained around the tank farm.	PAFF site / throughout construction period	Project Proponent	TMEIA	Y	Y	Y	Franchisee	Ongoing
8.10	7.2.1	The design of the PAFF should incorporate materials, details and textures which are visually recessive.	PAFF site / design	Project Proponent	TMEIA	Y	Y		N/A	Ongoing
8.10	7.2.1	Colours should be of low chromatic intensity to reduce the potential contrast between the structure and their background.	PAFF site tanks / design	Project Proponent	TMEIA	Y	Y		N/A	Ongoing
8.10	7.2.1	Visually permeable security fencing should be used around the perimeter.	Site perimeter	Project Proponent	TMEIA	Y	Y	Y	N/A	Ongoing
8.10	7.2.1	Minimum amount of lighting for the tanks shall be used, only applied for safety at the key access points and staircases.	Tanks / Operational phase	Project Proponent	TMEIA	Y	Y	Y	N/A	Ongoing
8.10	7.2.1	Limited lighting intensity on the site.	PAFF site / Operational phase	Project Proponent	TMEIA	Y	Y	Y	N/A	Ongoing
8.10	7.2.1	Directional down lighting is suggested to minimise light spill to the surrounding area.	PAFF site / Operational phase	Project Proponent	TMEIA	Y	Y	Y	N/A	Ongoing

Cultural Heritage

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
9.8.1	9.2.1	Undertake a watching brief during dredging of the pipeline within 25m either side of anomalies SS1 and SS2. This should comprise: <ul style="list-style-type: none"> Dredge operators to be made aware of the potential presence of cultural heritage material. The operators would be required to report to the AMO any unusual resistance and/or recovery of timbers, anchors or other wreck related material. Any obstacles encountered during the dredging that are of timber should be reported to the marine archaeologist. The obstacle should be avoided and not removed until it has been assessed by the marine archaeologist as to whether the obstacle is of cultural heritage importance; A marine archaeologist shall be on board the dredging barge during dredging within 25m either side of SS1 and SS2 in the event of any unusual resistance occurring or blockages which requires the dredge head to be brought on deck for cleaning and examination; and, 	Within vicinity of SS1 and SS2	Franchisee	TMEIA		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
		<ul style="list-style-type: none"> Dredging to cease in the nominated area SS1 after 3 meters of sediment removal and after 1 metre for SS2. A dive survey will then be undertaken to examine the trench for possible cultural remains. 								
9.8.2	9.2.1	During the course of the watching brief, if the targets are identified as being potentially archaeologically important, then an immediate marine archaeological impact assessment in accordance with EIAO TM Annex 19 will be required to be undertaken by a qualified marine archaeologist.	With vicinity of SS1 and SS2	Franchisee	TMEIA		Y		N/A	Ongoing
9.8.4	9.2.1	Any changes, additions or alterations to the dredging method and alignment should be further assessed by marine archaeologist to determine if any further assessment is required.	Pipeline alignment	Franchisee	TMEIA		Y		N/A	Ongoing
Fuel Spill Risk										
11.4.1	10.2	Tank farms will be constructed in a bunded area surrounding the tanks which will have collection capacity of 150% of the maximum content of the largest tank.	Tank farm / Design Phase	Franchisee	TMEIA		Y		N/A	On going
11.4.1	10.2	Emergency shut down valves shall be installed within the wider site storm drainage system.	Tank farm / Design Phase	Franchisee	TMEIA		Y		N/A	On going
11.4.1	10.2	An impermeable membrane shall be installed in the tank foundation beneath the tank bottom.	Tank farm / Design Phase	Franchisee	TMEIA		Y		N/A	On going
11.4.1	10.2	Pipeline to be covered with a protective rock armour layer.	Pipelines/ Design Phase	Franchisee	TMEIA		Y		Franchisee	On going
11.4.1	10.2	An integrated leak detection system shall be installed to all pipelines to provide early detection of any leak.	Pipelines/ Design Phase	Franchisee	TMEIA		Y		N/A	On going

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
11.4.1	10.2	An automatic shut-off system shall be implemented for pipelines.	Pipelines/ Design Phase	Franchisee	TMEIA	Y			N/A	On going
11.4.1	10.2	A workboat shall be on standby at the jetty during tanker berthing.	Jetty/ During Tanker Berth	Franchisee	TMEIA	Y	Y		N/A	Pending
11.4.1	10.2	Skimmers shall be available for quick deployment in case of a spill.	Jetty/ During Tanker Berth	Franchisee	TMEIA	Y	Y		N/A	Pending
11.4.1	10.2	An emergency response plan shall be prepared prior to the operation of the PAFF.	Jetty/ During Tanker Berth	Franchisee	TMEIA	Y	Y		N/A	Pending
11.4.1	10.2	Operator-training programme shall be implemented.	Jetty/ During Tanker Berth	Franchisee	TMEIA	Y	Y		N/A	Pending
11.6	10.4	During the planning of the later phase of the tank farm development, in order to ensure that the required mitigation measures are undertaken at that time, review the EIA report only if the latest technology, industrial standards and statutory requirements have changed by that time.	During planning stage for future tank construction	Franchisee	TMEIA		Y		N/A	Pending

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
11.6	10.4	Regular inspections and audits will be undertaken by the Franchisee during the operational phase of the facility: <ul style="list-style-type: none"> Two inspections every year of the tank farm, jetty and pipelines including one undertaken pursuant to the Joint Inspection Group (JIG) explained above; Inspection of the whole sub sea pipelines every 5 to 10 years; Health, Safety and Environmental audit of the facility once every 3 years; and, Inspection of the structural integrity of the tanks once per year. 	Operation	Franchisee	TMEIA			Y	N/A	Pending
11.6	10.4	Prepare an Environmental Management Plan to ensure the on-going adequacy of the fuel spill contingency plan and that it is being implemented as required and that the above mitigation measures have been incorporated and are effective.	Within 3 months of start of operation of the PAFF with audits every 24 months	Franchisee	TMEIA			Y	N/A	Pending
Land Contamination										
13.5.1	10.2	Bunding shall be provided by all fuel storage areas to at least 150% of largest individual tank in each compound.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	On going
13.5.1	10.2	Relevant design standards for storage tanks, pipework, containment and drainage shall be adhered to.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	On going
13.5.1	10.2	Plant inspections and maintenance shall be undertaken once per month.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.1	10.2	Impermeable lining shall be provided for all tank pits.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	On going

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
13.5.1	10.2	Leak detection systems shall be provided to all valves.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	On going
13.5.1	10.2	Surface drainage shall be contained and treated prior to discharge.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.1	10.2	Emergency spill response plans shall be prepared.	Tank farm / Design	Franchisee	TMEIA	Y		Y	N/A	Pending
13.5.1	10.2	Spill control materials and equipment shall be provided on site.	Tank farm / Design	Franchisee	TMEIA	Y		Y	N/A	Pending
13.5.1	10.2	Runoff from the roof of site buildings and landscaped areas shall be conveyed in closed drains to the nearest storm water drain to prevent the generation of excessive quantities of surface water which may be polluted.	Tank farm / Design	Franchisee	TMEIA	Y		Y	N/A	On going
13.5.5	10.2	Suitable absorbent materials (e.g. sand or earth) shall be kept on site to deal with spills. Chemical dispersants shall not be employed.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	Pending
13.5.5	10.2	The facility shall be designed, constructed, operated and maintained in full accordance with the Code of Practice for Oil Installations, 1992.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.5	10.2	Tank pressure testing shall be carried out routinely to check for possible tank leaks. Product inventory monitoring shall be integrated into site management procedures to check for any abnormal or unexpected product loss.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.5	10.2	Tank overflow monitoring systems shall be installed and regularly tested. Inlet valves shall be designed to automatically shutdown on exceedance of "high-high level" to prevent over-filling.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.5	10.2	Pipe leakages shall be routinely checked for by means of a pressure sensitive leak detection system and routine inventory control.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
13.5.5	10.2	Drainage from areas of hardstanding shall be treated by means of oil/water separators prior to discharge to storm drain. All surface drainage shall be fitted with closure valves to provided additional containment and facilitate clean up of any leaks.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	On going
13.5.5	10.2	The delivery pipeline from the jetty and the supply line to the airport shall be fitted with pressure sensitive leak detectors.	Tank farm / Design	Franchisee	TMEIA	Y	Y		N/A	On going
Waste Management										
14.7.2	8.3.1	The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	The waste coordinator shall prepare and implement a Waste Management Plan which specifies procedures such as ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of waste does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposal.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		N/A	Ongoing
14.7.2	8.3.1	No waste shall be burnt on site.	PAFF Site throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Excavated material shall be used on site for purposes of landscaping or formation of bund walls as far as possible.	All site / throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All material shall be reused on site as far as practicable, including formwork plywood, topsoil and excavated material.	All site / throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Suitable provisions shall be included in the construction contract to ensure that the Contractor sorts and recycles waste.	Contract preparation stage	HyD	TMEIA		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	Re-use and recycling of waste must always be considered first. Waste disposal shall only be undertaken in the last resort. Any surplus material generated shall be sorted on site into construction and demolition (C&D) waste and the public fill fraction. A sorting facility shall be set up on the site.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	The C&D waste shall be disposed of at a licensed landfill or deposited at an authorised waste transfer facility and the material suitable for public fill delivered to a public filling area, public filling barging point or public fill stockpile area after obtaining the appropriate licence.	CEDD public fill stockpile in Mui Wo, North Lantau or Mui Wo refuse transfer stations / Throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Stockpile material shall avoid vegetated areas.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Stockpiles shall be covered by tarpaulin and/or watered as required.	All areas / throughout construction period, particularly during dry season	Contractor	TMEIA, Public Health and Municipal Services Ordinance (Cap 132) and the Public Cleansing and Prevention of Nuisances (Regional Council) By-laws		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	Storage of material on site should be kept to a minimum.	All areas / throughout construction period	Contractor	TMEIA, Public Cleansing and Prevention of Nuisances (Regional Council) By-laws		Y		N/A	Ongoing
14.7.2	8.3.1	Excavated material in trucks shall be covered by tarpaulins.	All areas, particularly at site exits / throughout construction period	Contractor	TMEIA, Reduce the potential for spillage and dust. Public Health and Municipal Services Ordinance (Cap 132) and the Public Cleansing and Prevention of Nuisances (Regional Council) By-laws		Y		N/A	Ongoing
14.7.2	8.3.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent the transfer of mud onto public roads.	Site entrances and exits / throughout construction period	Contractor	TMEIA, Public Cleansing and Prevention of Nuisances (Regional Council) By-laws		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	Suitable chemical waste storage areas should be formed at the works site for temporary storage pending collection.	Works site/ throughout construction period	Contractor	TMEIA, Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. A Guide to the Chemical Waste Control Scheme		Y		N/A	Ongoing
14.7.2	8.3.1	A licensed contractor shall be employed to collect chemical waste for delivery to a licensed treatment facility.	Chemical waste treatment facility at Tsing Yi / throughout construction period	Contractor	TMEIA, Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. A Guide to the Chemical Waste Control Scheme		Y		N/A	Ongoing
14.7.2	8.3.1	Temporary storage areas for general refuse should be enclosed to avoid environmental impacts.	All areas/ throughout construction period	Contractor	TMEIA, Public Health and Municipal Services Ordinance		Y		N/A	Ongoing
14.7.2	8.3.1	Sufficient dustbins should be provided for storage of waste.	All areas/ throughout construction period	Contractor	TMEIA, Public Cleansing and Prevention of Nuisances Ordinance (Regional Council) By-laws, Public Health and Municipal Services Ordinance		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	General refuse should be cleared daily and should be disposed of to the nearest licensed facility.	All areas, WENT landfill or NWNT refuse transfer stations/ throughout construction period	Contractor	TMEIA, Sanitation and Conservancy (Regional Council) By-laws		Y		N/A	Ongoing
14.7.2	8.3.1	Waste oils, chemicals or solvents shall not be disposed of to drain.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Good site practice shall be implemented to avoid waste generation and promote waste minimisation.	PAFF site/ throughout construction period	Contractor	TMEIA		Y			Ongoing
14.7.2	8.3.1	Waste materials such as paper, metal, timber and waste oil shall be recycled as far as practicable.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Temporary structures used during construction shall be provided in the form of proprietary Protakabin type units sited on areas of permanent hard paving units as far as practicable.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Sea Ordinance.	PAFF site/ throughout construction period				Y		N/A	Ongoing
14.7.2	8.3.1	All waste containers shall be in good condition and fitted with lids or covers to prevent waste from escaping or the ingress of water.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All waste containers shall be in a secure area on hardstanding.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2	8.3.1	Emergency equipment to deal with any spillage or fire shall be kept on site.	PAFF site/ throughout construction period		TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All containers used for storage of chemical waste shall be maintained in good condition and clearly labelled in both English and Chinese.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All storage areas for chemical waste shall be: <ul style="list-style-type: none"> Clearly labelled; Enclosed on at least 3 sides; Have impermeable floor and bunding sufficient to fully retain any spillage or leakages; Ventilated; and, Covered to prevent rainfall from entering. 	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All types of asbestos including sources (such as clutch linings) shall be treated as chemical waste. Asbestos containing wastes shall be kept separate from other wastes.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	All leaking containers shall be contained and removed from site as soon as is reasonably practicable.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing
14.7.2	8.3.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.	PAFF site/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location / Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Schedule			Maintenance Agency	Implementation Status
						D	C	O		
14.7.2 Section 5	8.3.1	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas/ throughout construction period	Contractor	TMEIA		Y		N/A	Ongoing

Annex E

Event and Action Plans

Table 1 *Event/Action Plan for Construction Noise*

Event	Action			
	ETL	IEC	FSR	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the IEC and Contractor 2. Carry out investigation 3. Report the results of investigation to the IEC and the Contractor 4. Discuss with the Contractor and formulate remedial measures 5. Consider undertaking ad hoc monitoring to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET 2. Review the proposed remedial measures by the Contractor and advise the FSR accordingly 3. Supervise the implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm the receipt of notification of failure in writing 2. Notify the Contractor 3. Require the Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC 2. Implement noise mitigation proposals

Note: ETL - Environmental Team Leader, IEC - Independent Environmental Checker, FSR - Franchisee's Site Representative

Table 2 *Event/Action Plan for Water Quality*

EVENT	ACTION			
	ETL	IEC	FSR	Contractor
Action Level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC and the Contractor and FSR; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss mitigation measures with the IEC and the Contractor; 	<ol style="list-style-type: none"> 1. Discuss with the ET and the Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the FSR accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the FSR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET and the IEC and propose mitigation measures to the IEC and the FSR; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC and the Contractor and FSR; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with the IEC and the Contractor; 6. Ensure mitigation measures are implemented; 	<ol style="list-style-type: none"> 1. Discuss with the ET and the Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the FSR accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess effectiveness of the implemented mitigation measures; 	<ol style="list-style-type: none"> 1. Inform the FSR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET and the IEC and propose mitigation measures to the IEC and FSR within 3 working days; 6. Implement the agreed mitigation measures.

EVENT	ACTION			
	ETL	IEC	FSR	Contractor
Limit Level being exceeded by one consecutive sampling day	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC, the Contractor and the DEP; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss mitigation measures with the IEC, the FSR and the Contractor; 6. Ensure mitigation measures are implemented; 	<ol style="list-style-type: none"> 1. Discuss with the ET / Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the FSR accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC, the ET and the Contractor on the proposed mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET, the IEC and the FSR and propose mitigation measures to the IEC and the FSR within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC, the Contractor and DEP; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with the IEC, the FSR and the Contractor; 6. Ensure mitigation measures are implemented; 	<ol style="list-style-type: none"> 1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the FSR accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC, the ET and the Contractor on the proposed mitigation measures; 2. Request Contractor to critically review working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess 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. 	<ol style="list-style-type: none"> 1. Inform the FSR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET, the IEC and the FSR and propose mitigation measures to the IEC and the FSR within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the FSR, slow down or stop all or part of the construction activities.

Table 3 *Action Plan for Dolphin Monitoring*

EVENT	ACTION			
	ETL	IEC	FSR	Contractor
Dolphin numbers recorded in the post-construction monitoring are significantly lower than those recorded in the pre-construction monitoring	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings; 2. Review historical data to ensure differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, FSR and Contractor; 5. Check monitoring data, all plant, equipment and Contractor’s working methods; 6. Discuss mitigation measures, such as additional dolphin monitoring, with the IEC and Contractor. 	<ol style="list-style-type: none"> 1. Discuss monitoring with the ETL and the Contractor; 2. Review proposals for repeat monitoring and any other measures submitted by the Contractor and advise the FSR accordingly; 	<ol style="list-style-type: none"> 1. Discuss the repeat monitoring and any other measures proposed by the ETL with the IEC; 2. Make agreement on the measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the FSR and confirm notification of the non-compliance in writing; 2. Discuss with the ETL and the IEC and propose measures to the IEC and the FSR; 3. Implement the agreed measures.

Note: ETL – Environmental Team Leader, IEC – Independent Environment Checker, FSR – Franchisee’s Site Representative

Table 4 Action Plan for Cultural Heritage, Landscape and Visual Resources

Action Level	ETL ⁽¹⁾	IEC ⁽¹⁾	FSR ⁽¹⁾	Contractor ⁽¹⁾
Non-conformity on one occasion	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the Contractor, IEC and the FSR 3. Discuss remedial actions with the IEC, the FSR and the Contractor 4. Monitor remedial actions until rectification has been completed 	<ol style="list-style-type: none"> 1. Check report 2. Check the Contractor's working method 3. Discuss with the ETL and the Contractor on possible remedial measures 4. Advise the FSR on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	<ol style="list-style-type: none"> 1. Identify Source 2. Inform the Contractor, IEC and the FSR 3. Increase monitoring frequency 4. Discuss remedial actions with the IEC, the FSR and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ETL and the Contractor on possible remedial measures 4. Advise the FSR on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Amend working methods 2. Rectify damage and undertake any necessary replacement

Note: (1) ETL – Environmental Team Leader, IEC – Independent Environmental Checker, FSR – Franchisee’s Site Representative

Annex F

Impact Water Quality Monitoring Results

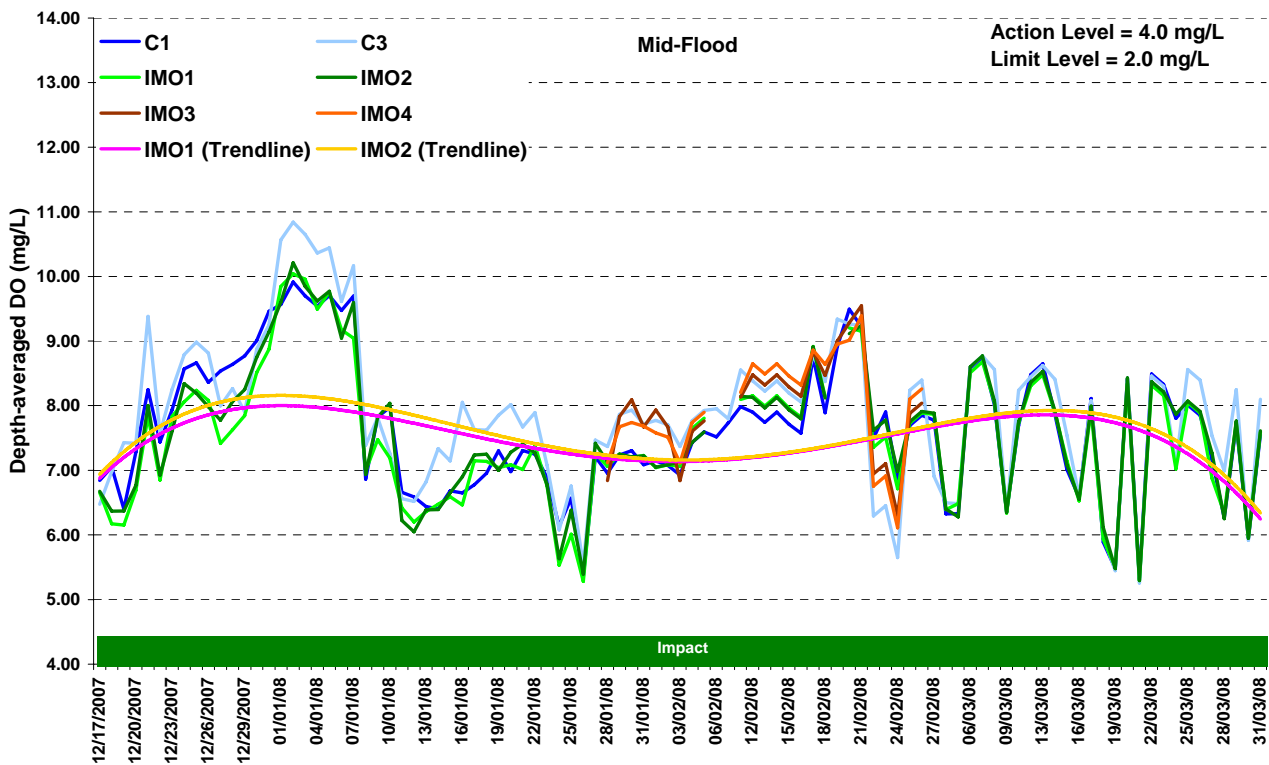
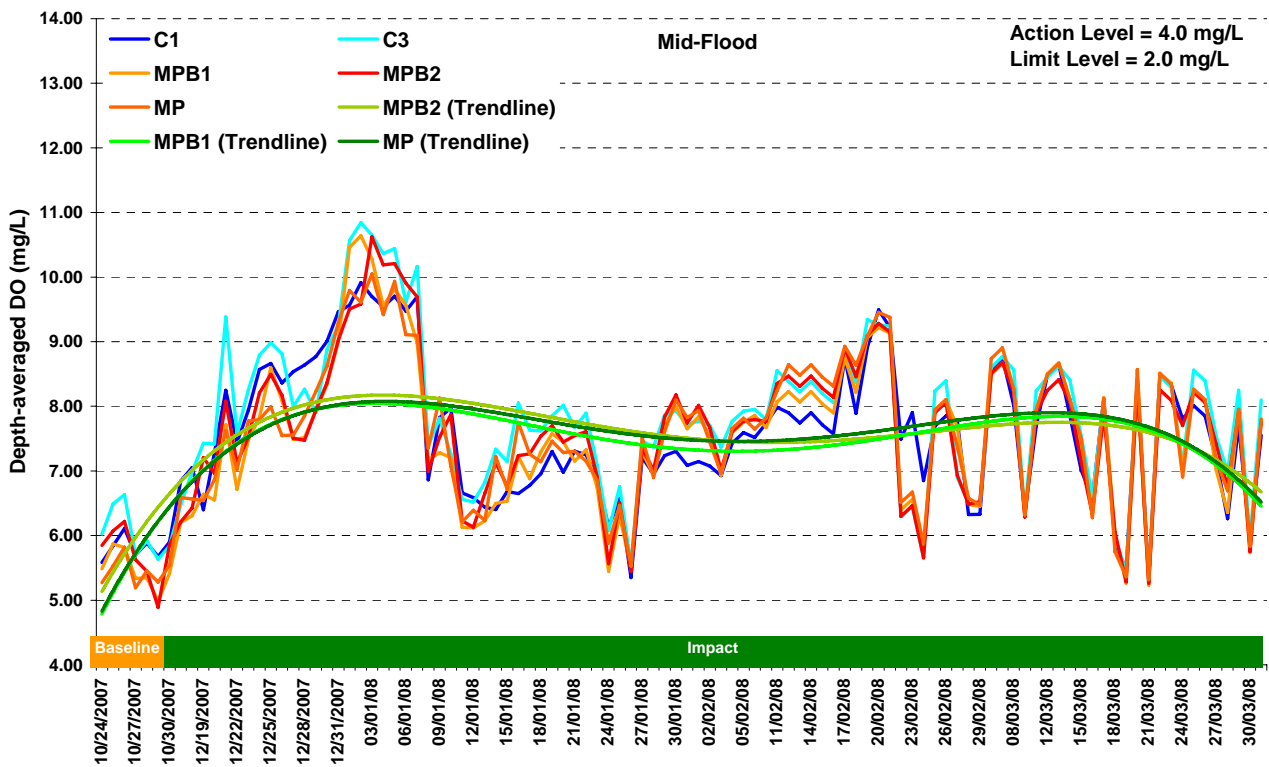


Figure G1 Dissolved oxygen concentration (depth-averaged) (mg/L) of water samples from the eight sampling locations at mid-flood between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.

Ref: 0018105_Annex G_water graphs.doc



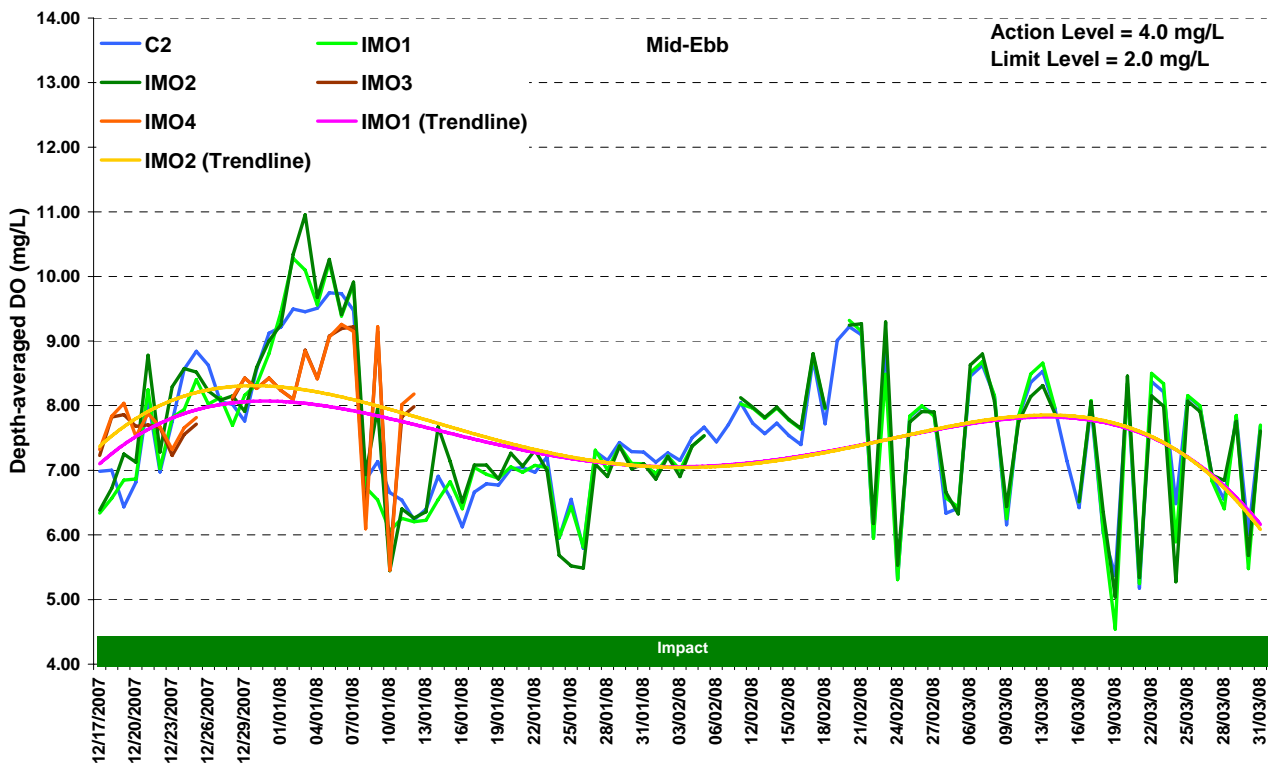
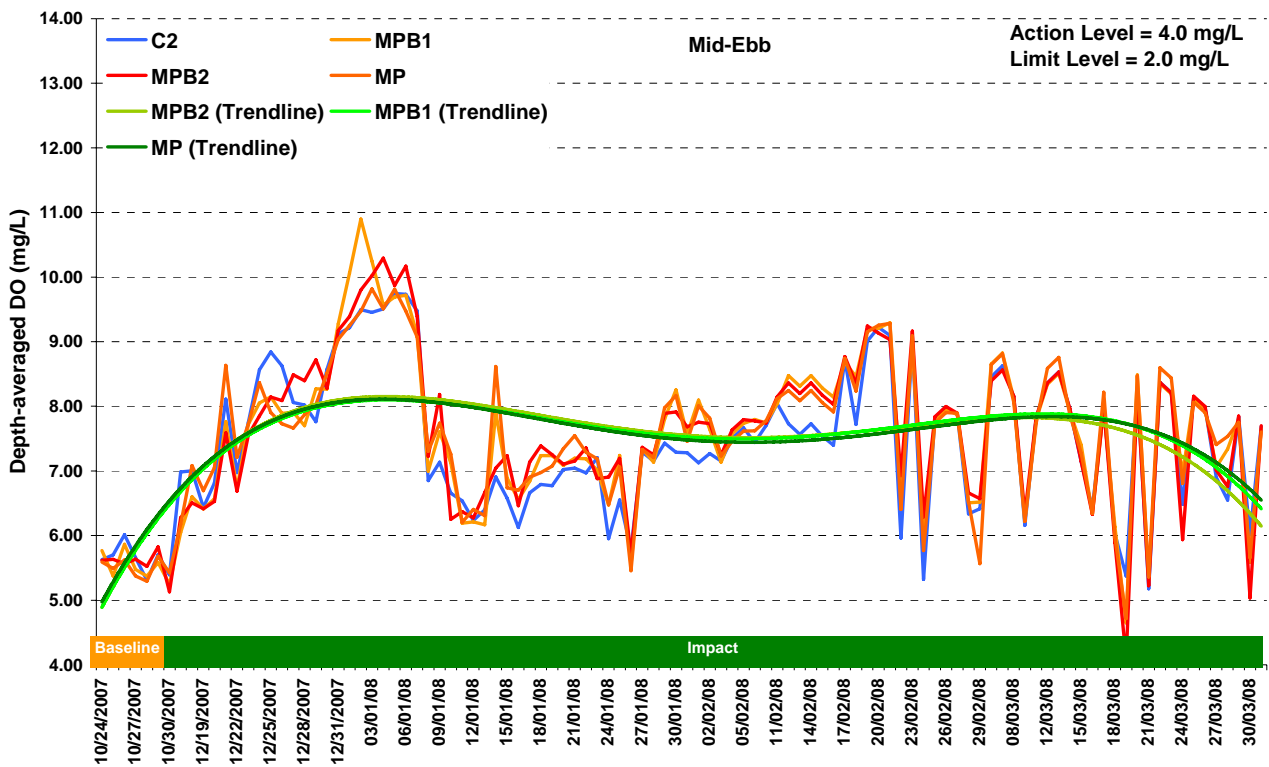


Figure G2 Dissolved oxygen concentration (depth-averaged) (mg/L) of water samples from the eight sampling locations at mid-ebb between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.



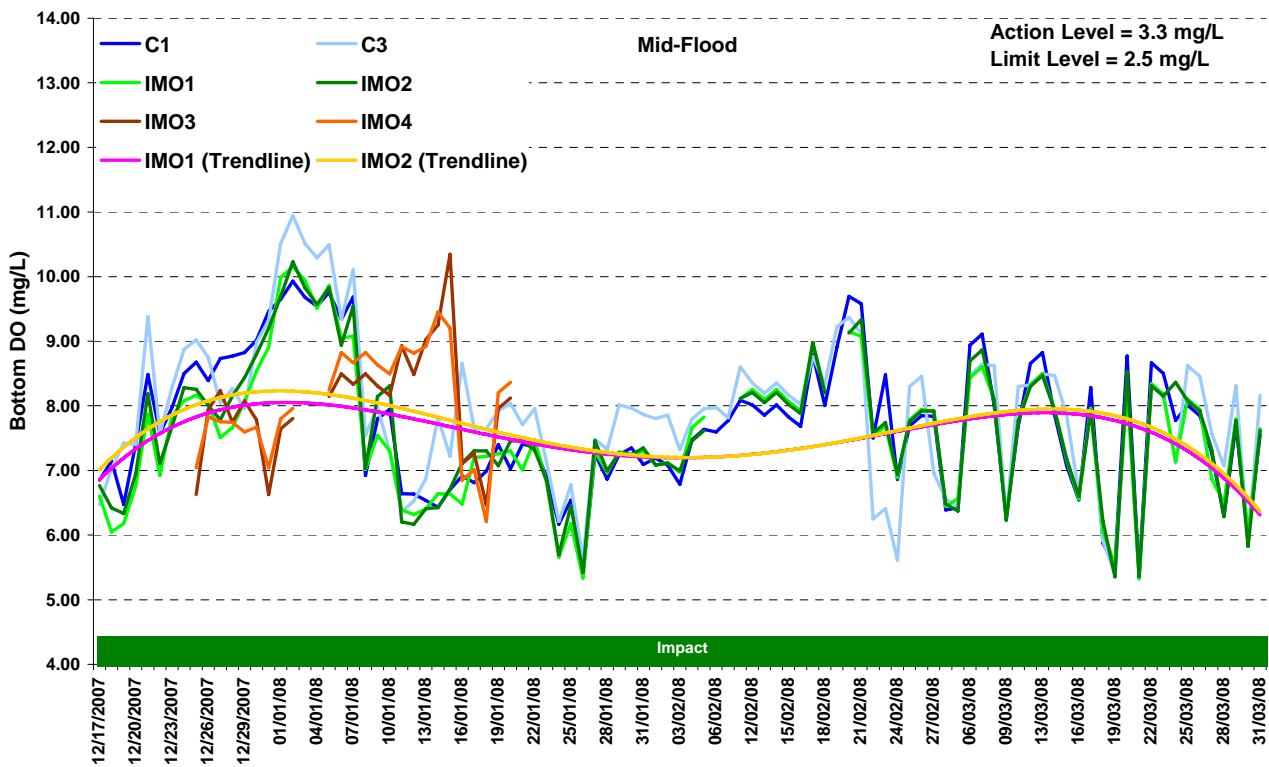
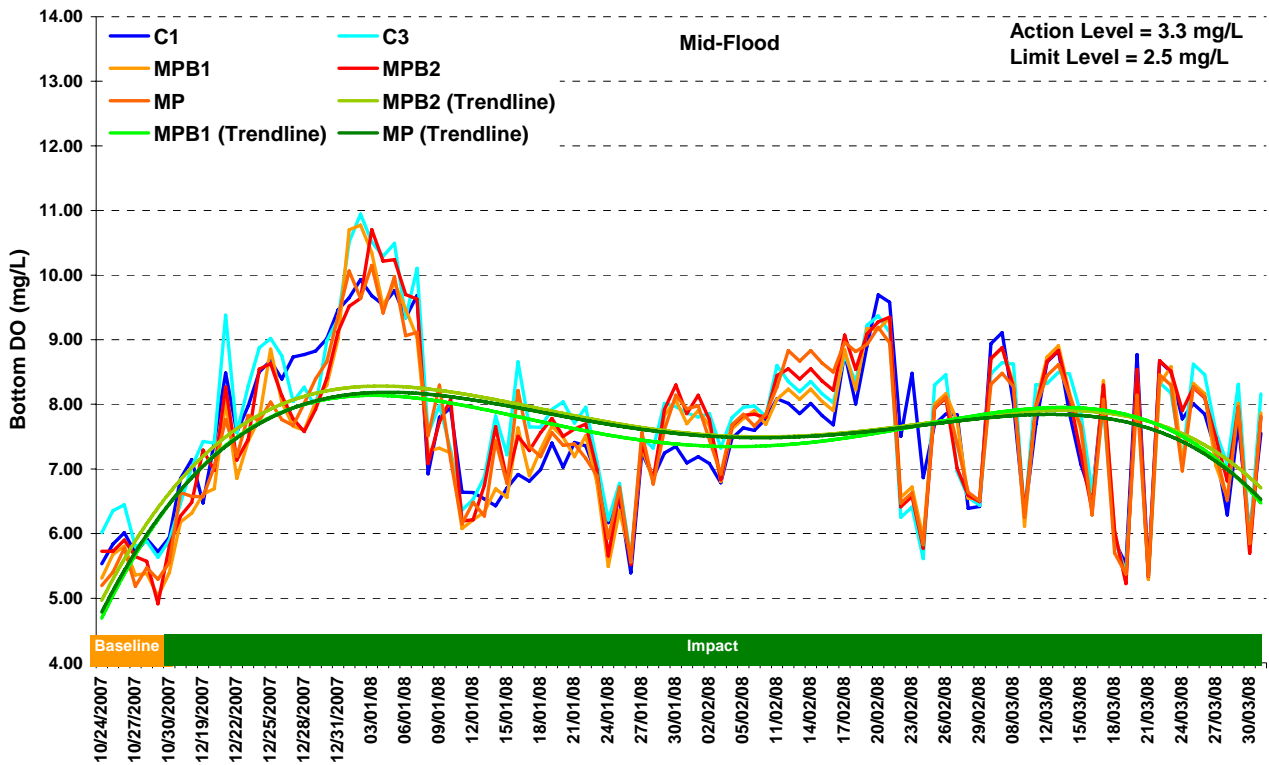


Figure G3 Dissolved oxygen concentration (bottom) (mg/L) of water samples from the eight sampling locations at mid-flood between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.

Ref: 0018105_Annex G_water graphs.doc



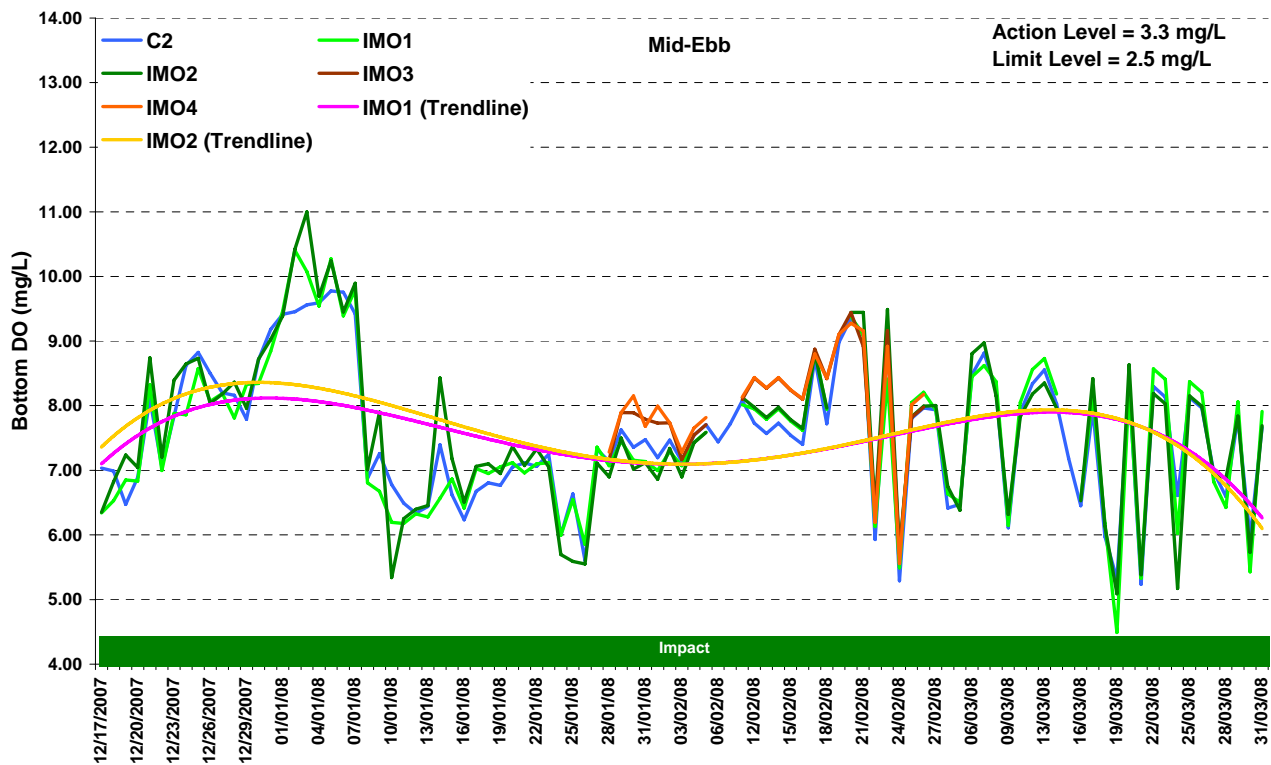
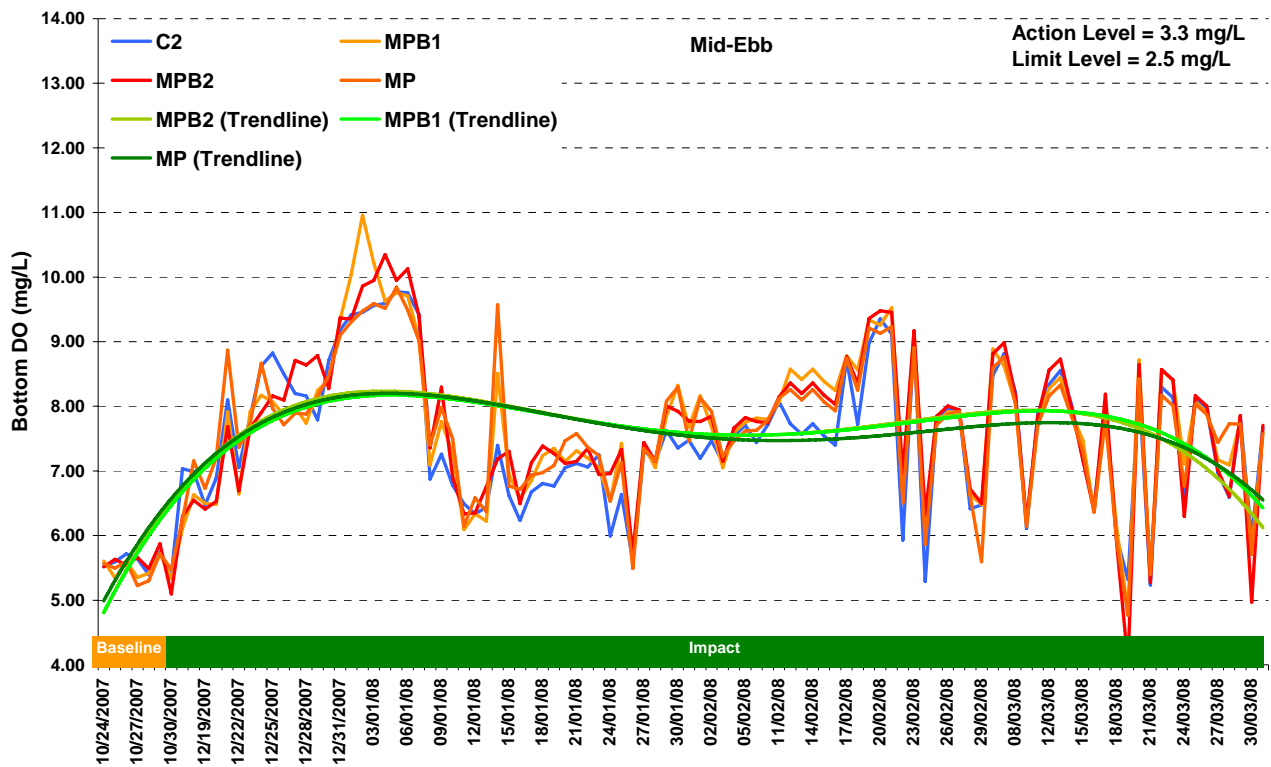


Figure G4 Dissolved oxygen concentration (bottom) (mg/L) of water samples from the eight sampling locations at mid-ebb between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.

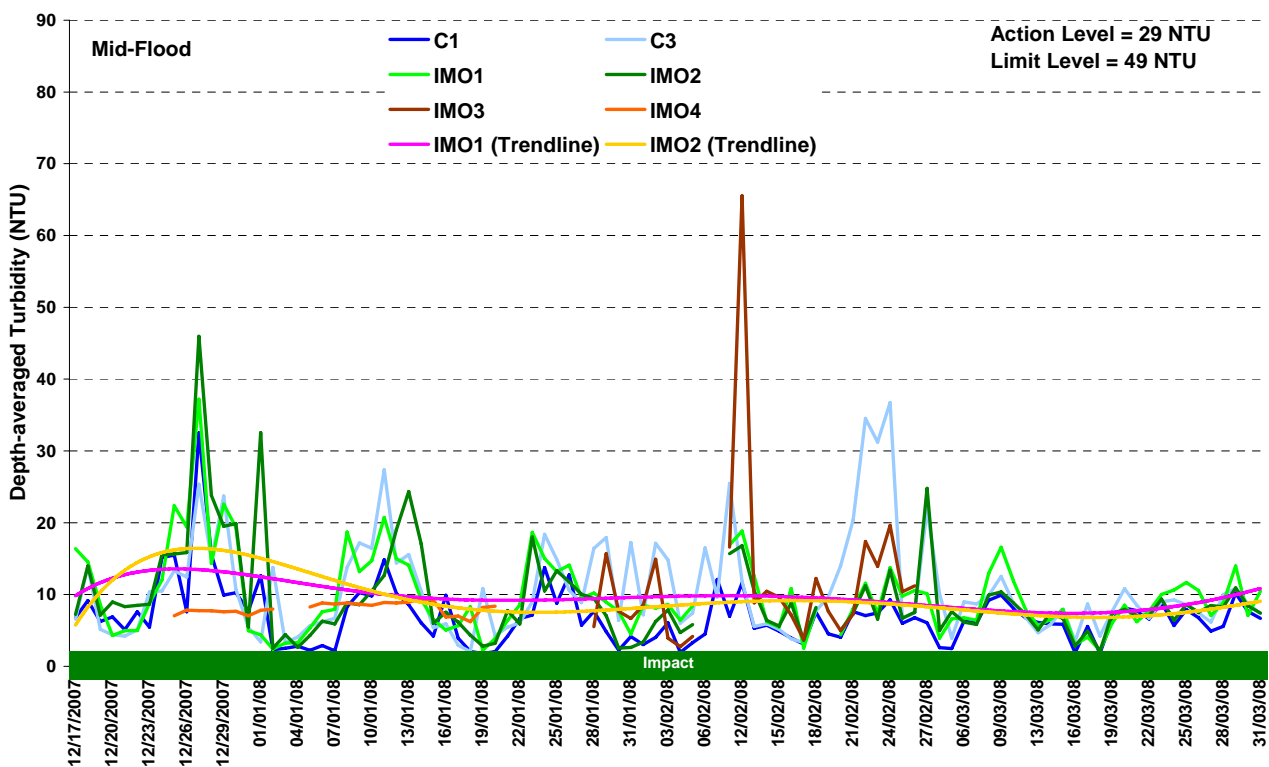
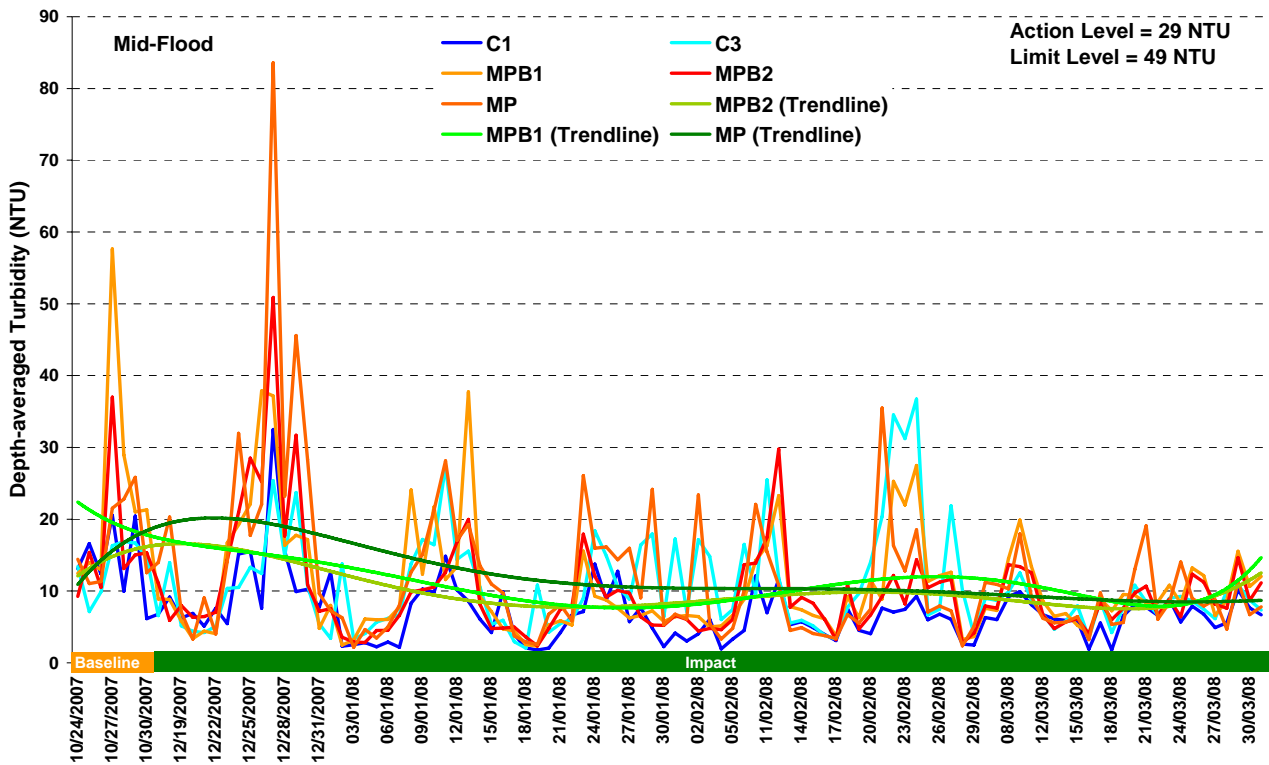


Figure G5 Depth-averaged turbidity (NTU) of water samples from the eight sampling locations at mid-flood between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.



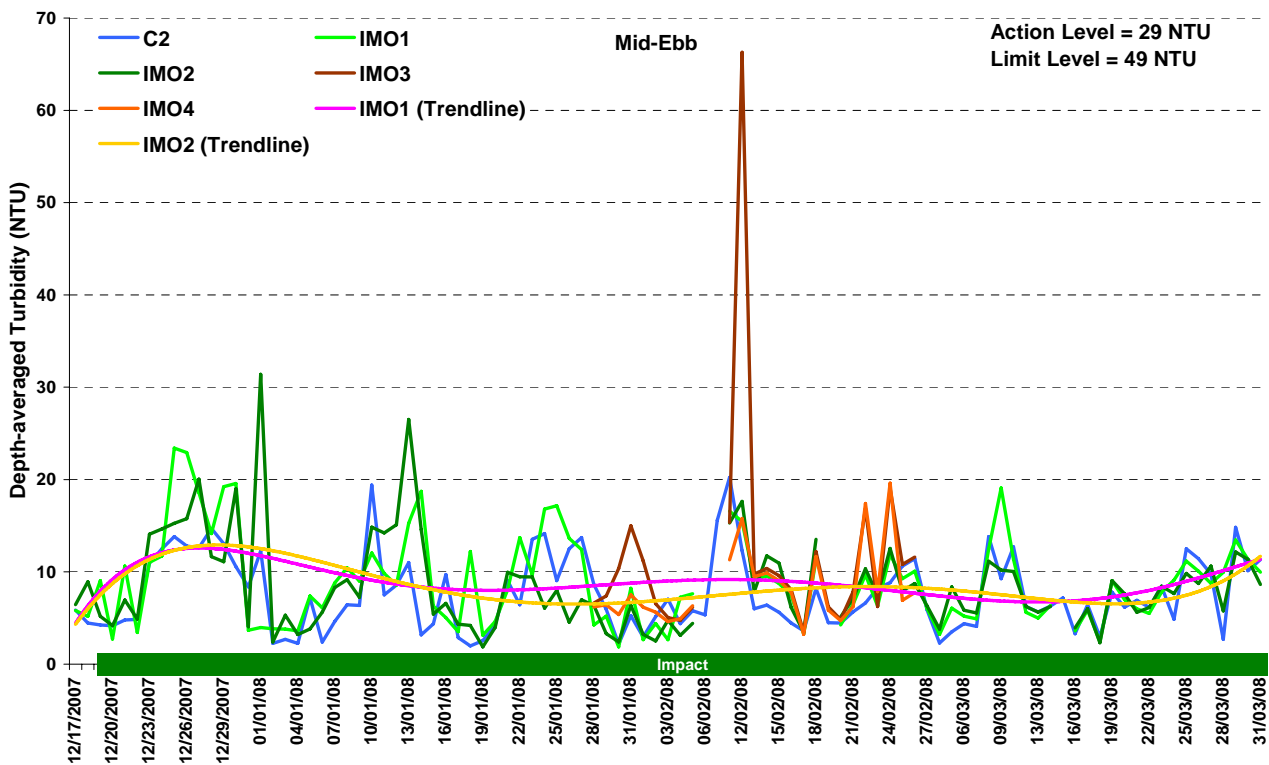
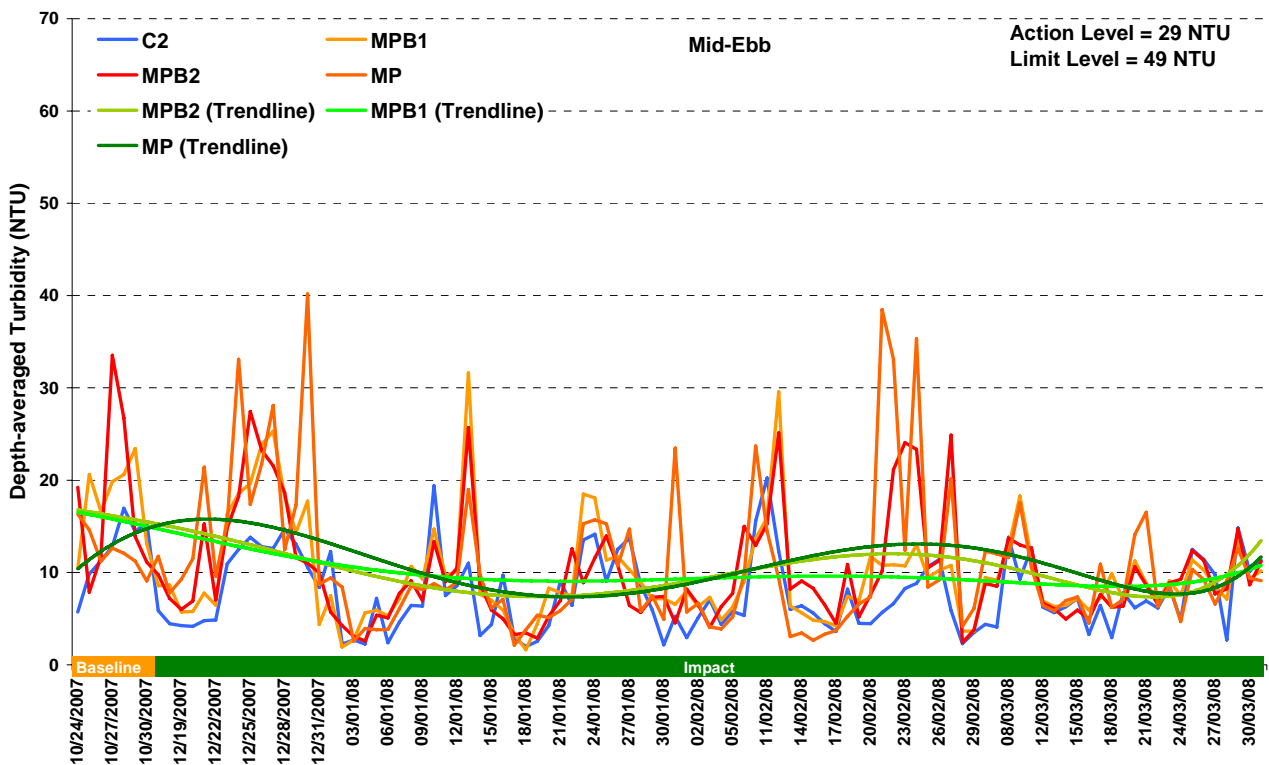


Figure G5 Depth-averaged turbidity (NTU) of water samples from the eight sampling locations at mid-ebb between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data.



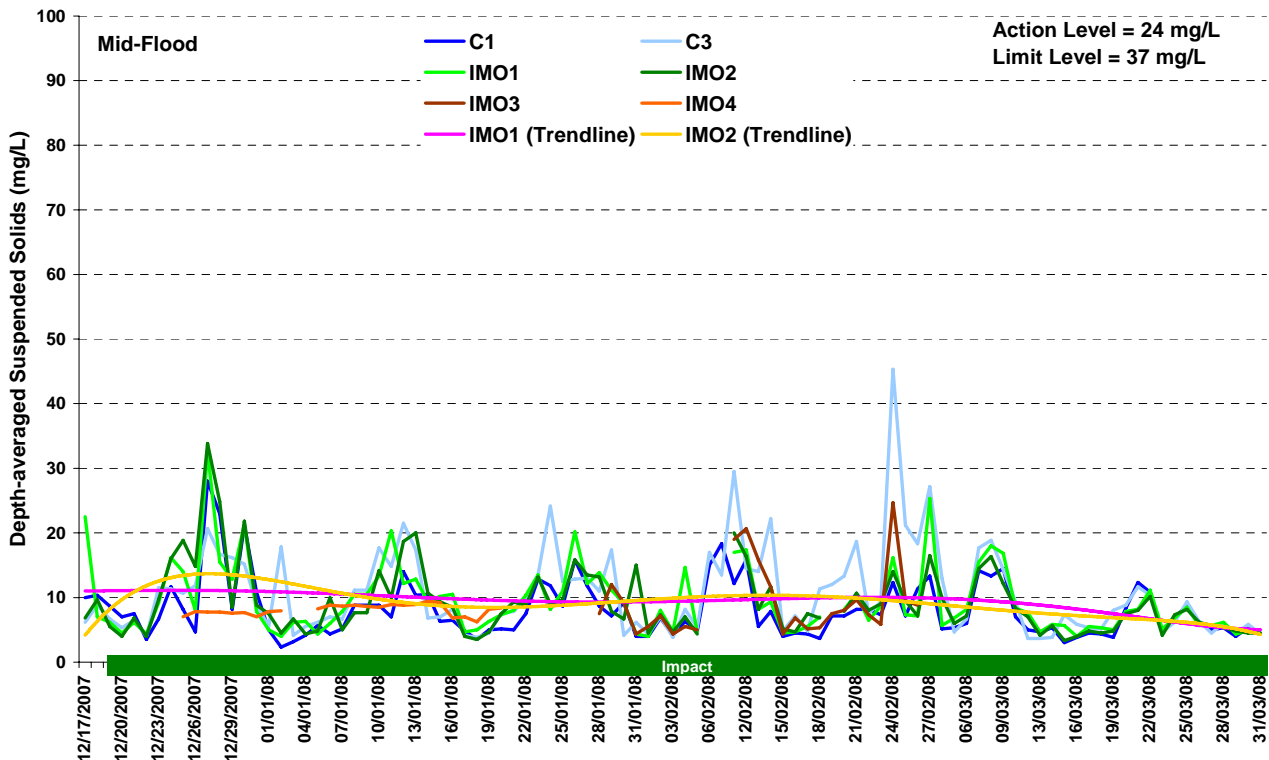
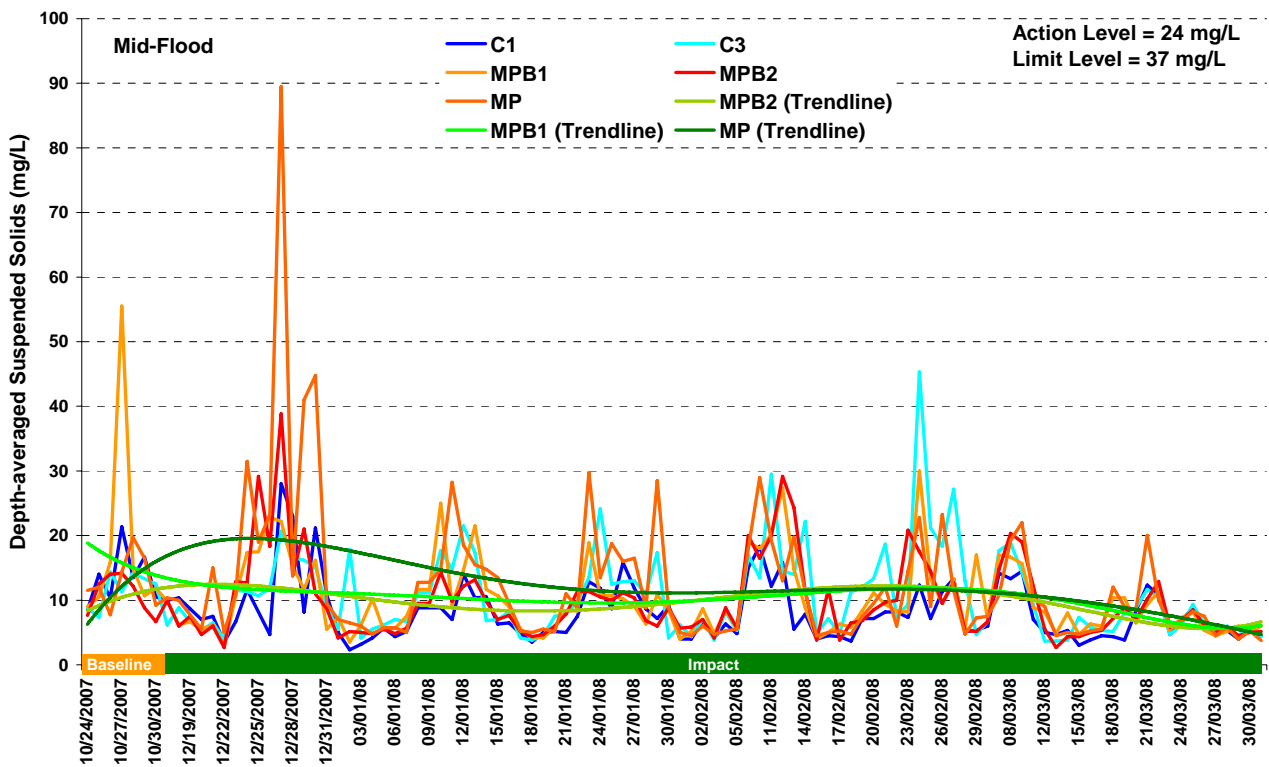


Figure G4 Depth-averaged suspended solids concentration (mg/L) of water samples from the eight sampling locations at mid-flood between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data



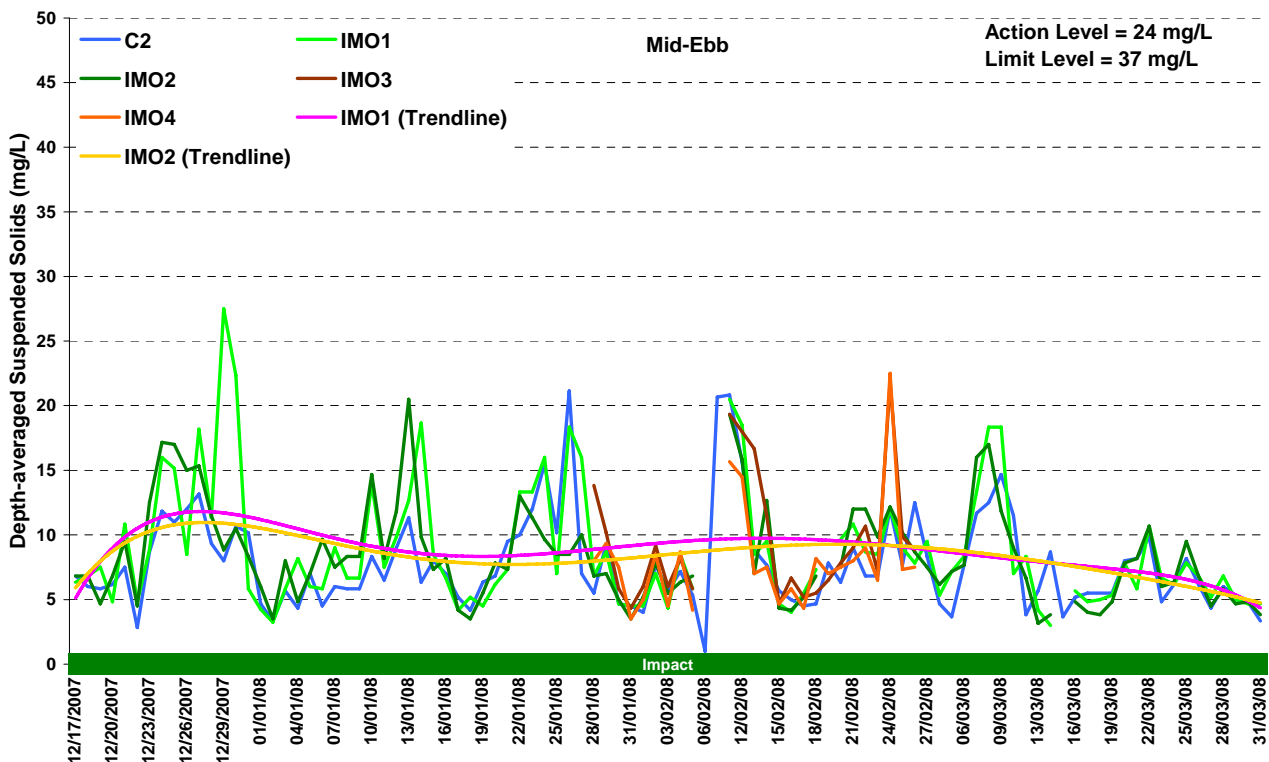
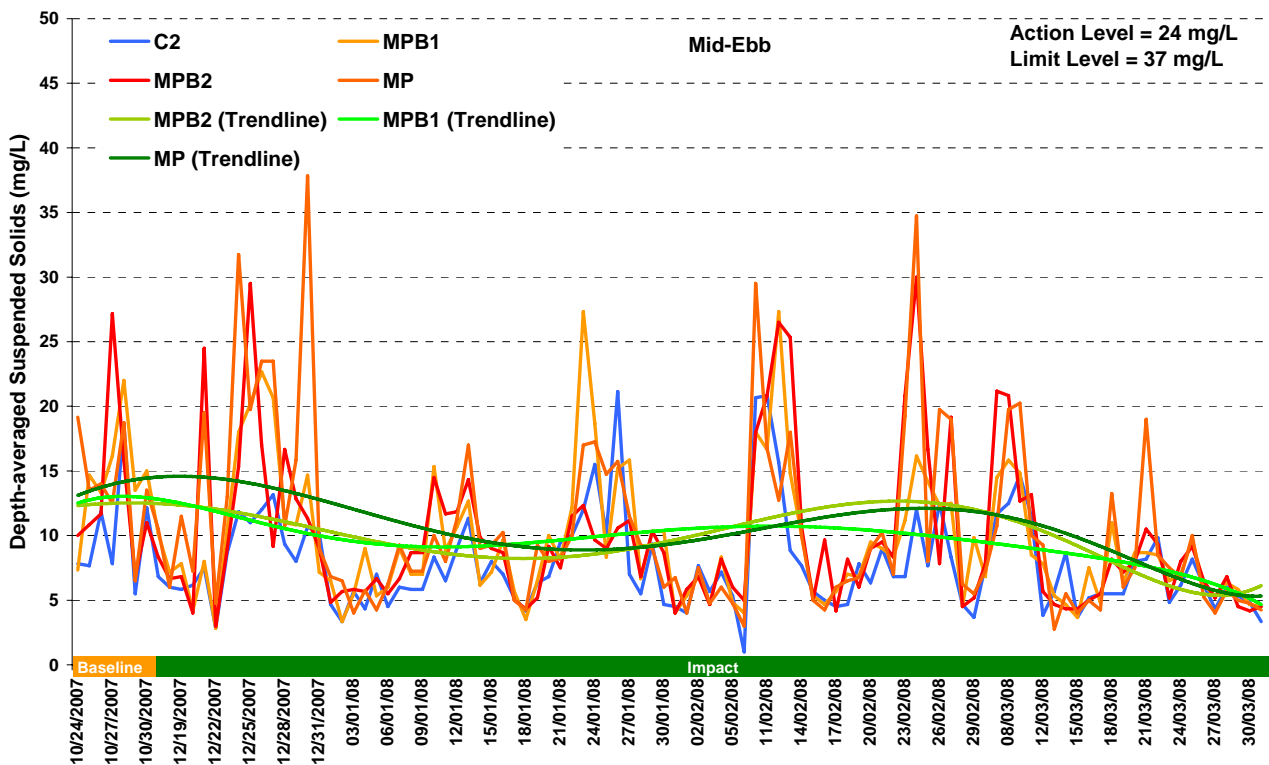


Figure G4 Depth-averaged suspended solids concentration (mg/L) of water samples from the eight sampling locations at mid-ebb between 10 October 2007 and 31 March 2008. Trendline is not plotted for stations IMO3 and IMO4 due to insufficient data



Annex G

Dolphin Sighting Records

Project name: EM&A for Permanent Aviation Fuel Facility (PAFF)

Activity: Dolphin Impact Monitoring - Field Log Sheet

*Remark: Record the number of dolphin occurrence within the 250m exclusion (A) prior to dredging and (B) during dredging

** Sighting recorded when there is no dredging

Week	Date		Dredger 1 (GD 4503)		Dredger 2 (GD 654)		Observers' Names
			No. of Dolphin Occurrence*	Sighting No.	No. of Dolphin Occurrence	Sighting No.	
1	Mon	17-Dec	No Dredging	-	N/A		Richard Huang, Anton Tsang
	Tue	18-Dec	0	-			Richard Huang
	Wed	19-Dec	0	-			Anton Tsang
	Thu	20-Dec	0	-			Richard Huang
	Fri	21-Dec	3; No Dredging (pm)	1**			Anton Tsang
	Sat	22-Dec	No Dredging	-			Anton Tsang
	Sun	23-Dec	0	-			Richard Huang
2	Mon	24-Dec	0	-	NA		Yeung Chung Wing
	Tue	25-Dec	3	2			Richard Huang
	Wed	26-Dec	0	-			Richard Huang
	Thu	27-Dec	0	-			Anton Tsang
	Fri	28-Dec	1	3			Richard Huang
	Sat	29-Dec	0	-			Richard Huang
	Sun	30-Dec	0	-			Richard Huang
3	Mon	31-Dec	0; No Dredging (pm)	-	NA		Anton Tsang
	Tue	01-Jan	0	-			Richard Huang
	Wed	02-Jan	1; No Dredging (pm)	4**			Anton Tsang
	Thu	03-Jan	0	-			Richard Huang
	Fri	04-Jan	0; No Dredging	-			Richard Huang
	Sat	05-Jan	0; No Dredging	-			Anton Tsang
	Sun	06-Jan	0	-			Yeung Chung Wing
4	Mon	07-Jan	0	-	NA		Richard Huang
	Tue	08-Jan	0	-			Richard Huang
	Wed	09-Jan	0	-			Anton Tsang
	Thu	10-Jan	0	-			Anton Tsang
	Fri	11-Jan	0	-			Yeung Chung Wing
	Sat	12-Jan	0	-			Yeung Chung Wing
	Sun	13-Jan	0	-			Yeung Chung Wing

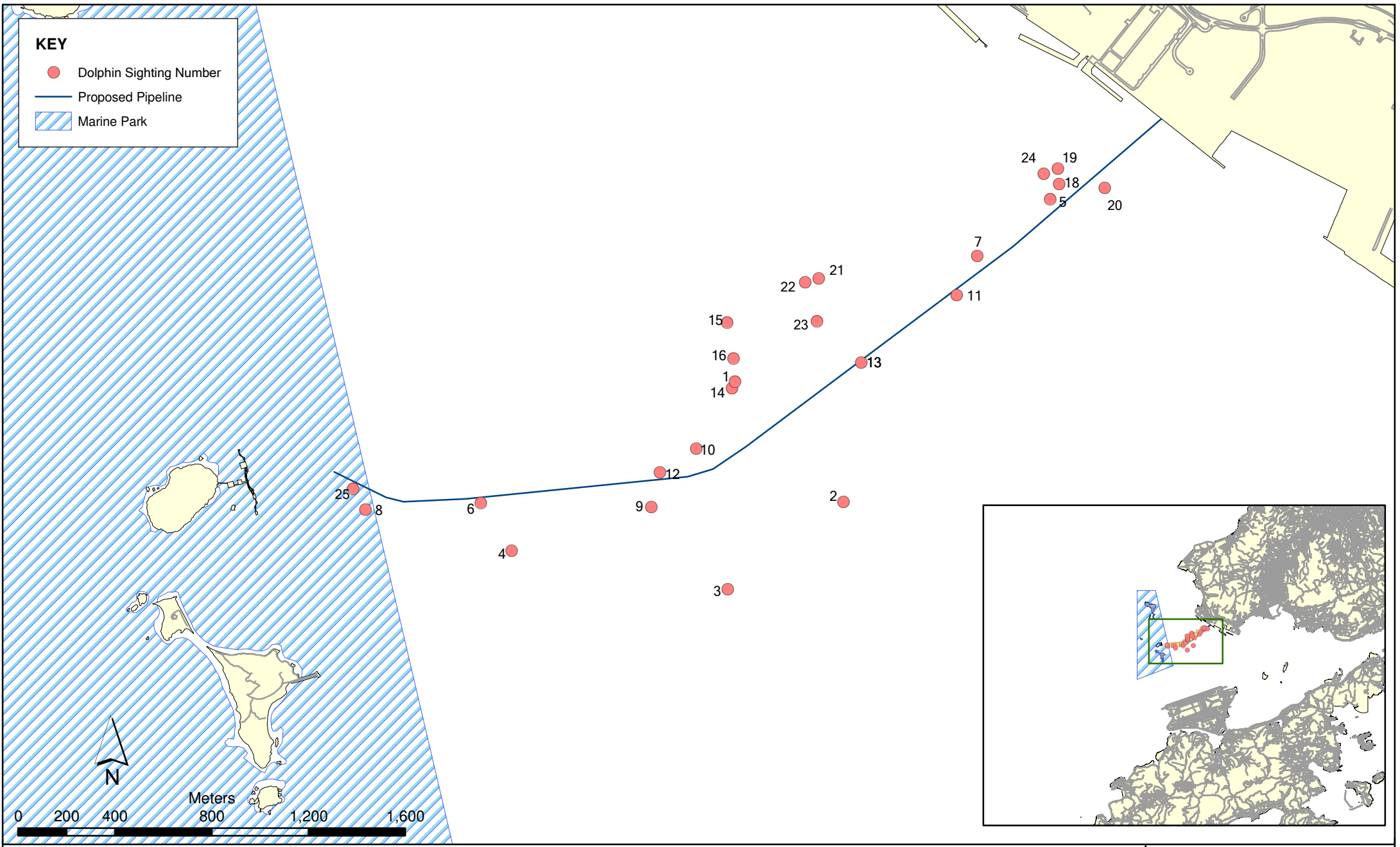
5	Mon	14-Jan	1 carcass	1 (in DCD sheet)	NA		Anton Tsang
	Tue	15-Jan	0	-			Richard Huang
	Wed	16-Jan	0	-			Richard Huang
	Thu	17-Jan	0	-			Yeung Chung Wing
	Fri	18-Jan	0	-			Richard Huang
	Sat	19-Jan	0	-			Richard Huang
	Sun	20-Jan	0	-			Yeung Chung Wing
6	Mon	21-Jan	0	-	NA		Richard Huang
	Tue	22-Jan	0	-			Richard Huang
	Wed	23-Jan	0	-			Anton Tsang
	Thu	24-Jan	1	5**	0	-	Richard Huang, Yeung Chung Wing
	Fri	25-Jan	0	-	0	-	Richard Huang, Anton Tsang
	Sat	26-Jan	0	-	0	-	Anton Tsang
	Sun	27-Jan	0	-	3	6**	Richard Huang, Yeung Chung Wing
7	Mon	28-Jan	0	-	0	-	Richard Huang
	Tue	29-Jan	0	-	0	-	Richard Huang
	Wed	30-Jan	0	-	0	-	Anton Tsang
	Thu	31-Jan	1	7**	0 (no dredging)	-	Richard Huang, Anton Tsang
	Fri	01-Feb	0	-	0	-	Richard Huang, Anton Tsang
	Sat	02-Feb	0	-	0	-	Richard Huang
	Sun	03-Feb	0	-	0	-	Yeung Chung Wing
8	Mon	04-Feb	0	-	1	8	Richard Huang, Anton Tsang
	Tue	05-Feb	0	-	0	-	Richard Huang
	Wed	06-Feb	0	-	0 (no dredging)	-	Richard Huang
	Thu	07-Feb	No Dolphin Monitoring				
	Fri	08-Feb	No Dolphin Monitoring				
	Sat	09-Feb	No Dolphin Monitoring				
	Sun	10-Feb	0	-	0	-	Richard Huang

9	Mon	11-Feb	0	-	0	-	Richard Huang	
	Tue	12-Feb	0	-	2	9	Richard Huang, Anton Tsang	
	Wed	13-Feb	0	-	0	-	Anton Tsang	
	Thu	14-Feb	0	-	0	-	Richard Huang	
	Fri	15-Feb	0	-	2	10	Anton Tsang	
	Sat	16-Feb	1	11**	1	12**	Richard Huang	
	Sun	17-Feb	0 (dredger under repair)	-	0	-	Richard Huang, Yeung Chung Wing	
10	Mon	18-Feb	0	-	1	13	Richard Huang, Anton Tsang	
	Tue	19-Feb	0 (dredger under repair)	-	1	14**	Richard Huang	
	Wed	20-Feb	0 (dredger changed to ST20)	-	2	15**	Richard Huang	
	Thu	21-Feb	0	-	3, 4	16**, 17**	Richard Huang, Yeung Chung Wing	
	Fri	22-Feb	0	-	0	-	Richard Huang, Anton Tsang	
	Sat	23-Feb	1	18	0	-	Richard Huang	
	Sun	24-Feb	0	-	0	-	Yeung Chung Wing	
11	Mon	25-Feb	0	-	0 (am), No dredging (pm)	-	Richard Huang, Anton Tsang	
	Tue	26-Feb	0	-	No dredging for GD 654		Richard Huang	
	Wed	27-Feb	0	-	No dredging for GD 654		Anton Tsang	
	Thu	28-Feb	0	-	No dredging for GD 654		Richard Huang	
	Fri	29-Feb	0	-	No dredging for GD 654		Richard Huang	
	Sat	01-Mar	No Dolphin Monitoring					
	Sun	02-Mar	No Dolphin Monitoring					
12	Mon	03-Mar	No Dolphin Monitoring					
	Tue	04-Mar	No Dolphin Monitoring					
	Wed	05-Mar	No Dolphin Monitoring					
	Thu	06-Mar	0	-	-	-	Richard Huang	
	Fri	07-Mar	1,1	19,20	-	-	Richard Huang	
	Sat	08-Mar	0	-	-	-	Richard Huang	
	Sun	09-Mar	0	-	-	-	Richard Huang	

13	Mon	10-Mar	2	21	-	Anton Tsang
	Tue	11-Mar	No Dolphin Monitoring			
	Wed	12-Mar	2,2	22,23	-	Anton Tsang
	Thu	13-Mar	0	-	-	Richard Huang
	Fri	14-Mar	0	-	-	Anton Tsang
	Sat	15-Mar	0	-	-	Richard Huang
	Sun	16-Mar	0	-	-	Richard Huang
14	Mon	17-Mar	0	-	-	Richard Huang
	Tue	18-Mar	0	-	-	Richard Huang
	Wed	19-Mar	0	-	-	Anton Tsang
	Thu	20-Mar	0	-	-	Anton Tsang
	Fri	21-Mar	1	24	-	Richard Huang
	Sat	22-Mar	0	-	-	Richard Huang
	Sun	23-Mar	0	-	-	Yeung Chung Wing
15	Mon	24-Mar	0	-	-	Richard Huang
	Tue	25-Mar	1	25	-	Richard Huang
	Wed	26-Mar	0	-	-	Anton Tsang
	Thu	27-Mar	0	-	-	Yeung Chung Wing
	Fri	28-Mar	0	-	-	Anton Tsang
	Sat	29-Mar	0	-	-	Richard Huang
	Sun	30-Mar	0	-	-	Richard Huang
16	Mon	31-Mar	0	-	-	Richard Huang
	Tue	01-Apr	No Dolphin Monitoring			
	Wed	02-Apr				
	Thu	03-Apr				
	Fri	04-Apr				
	Sat	05-Apr				
	Sun	06-Apr				

KEY

- Dolphin Sighting Number
- Proposed Pipeline
- ▨ Marine Park



Dolphin Sighting Locations (as of 31 March 2008)

19	07/03/2008	1018	ST20	Urmston Road	450	810019.75	825074.94	11	200	1	1UA	2	None	Traveling	
					460	810011.71	825068.99								
20	07/03/2008	1117	ST20	Urmston Road	450	810019.75	825074.94	180-220	70-220	1	1UA	2	None	Spy-hopping, traveling, breaching, porpoising	
					460	810011.71	825068.99								
21	10/03/2008	1147	ST20	Urmston Road	1605	809091.025	824388.279	240	90	2	1UA, 1SJ	2	None	Travelling	No dredging
					1540	809143.291	824426.922								
22	12/03/2008	1150	GD654	Urmston Road	1600	809095.045	824391.252	240	75	2	2UA	3	None	Travelling	Dolphin-watching vessel passed by; Travelling away from dredger; During dredging
					1555	809131.229	824418.005								
23	12/03/2008	1220	GD654	Urmston Road	1600	809095.045	824391.252	80	60	2	1UA, 1SJ	3	None	Feeding	Wandering around between distance of 80-300m from dredger and stayed for ~6mins; No dredging
					1555	809131.229	824418.005								
24	21/032008	1620	GD31	Urmston Road	550	809939.34	825015.48	51	150	2	2UA	2	None	Travelling	-
					560	809931.29	825009.54								
25	25/03/2008	1110	GD31	Urmston Road	750	807161.08	823724.02	50	30	1	1UA	2	None	Travelling	-
					760	807111.18	823720.96								
*Key:															
UC = Unspotted Calf															
UJ = Unspotted Juvenile															
SJ = Spotted Juvenile															
SS = Spotted Sub-adult															
SA = Spotted Adult															
UA = Unspotted Adult															

ERM has over 100 offices

Across the following
countries worldwide

Argentina	Malaysia
Australia	Mexico
Azerbaijan	The Netherlands
Belgium	Peru
Brazil	Poland
Canada	Portugal
Chile	Puerto Rico
China	Russia
France	Singapore
Germany	South Africa
Hong Kong	Spain
Hungary	Sweden
India	Taiwan
Indonesia	Thailand
Ireland	UK
Italy	US
Japan	Vietnam
Kazakhstan	Venezuela
Korea	

ERM's Hong Kong Office

**21/F Lincoln House
Taikoo Place, 979 King's Road
Island East, Hong Kong
T: 2271 3000
F: 2723 5660**

www.erm.com