



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

Second Annual Environmental Monitoring and Audit Report – July 2008 to June 2009

27 July 2009

Environmental Resources Management

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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:	2 nd Annual EM&A Report July 2008 to June 2009
Date of Report:	27 July 2009
Date received by ET:	27 July 2009
Date received by IEC:	27 July 2009


Reference EM&A Manual Recommendation

EM&A Manual Recommendation:	Sections 13.5 and 13.6
Content:	EM&A Reports
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: 27 July 2009

IEC Verification

I hereby verify that the above referenced document/ plan complies with the above referenced sections of the EM&A Manual recommendation	
Dr Guiyi Li, Independent Environmental Checker:	 Date: 5/8/2009


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)
Second Annual Environmental Monitoring and Audit Report
July 2008 to June 2009**

27 July 2009

Prepared by: Karen Lui/Craig A Reid

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For and on behalf of Environmental Resources Management	
Approved by:	Craig A Reid
Signed:	
Position:	Environmental Team Leader
Date:	27 July 2009

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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 **second** annual Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from **1st July 2008 to 30th June 2009** in accordance with the *EM&A Manual*.

Breaches of all Action and Limit Levels

Water quality monitoring during dredging activities, conducted from 1 September 2008 to 23 January 2009, recorded exceedances of the Action Limit Level for Depth-averaged Dissolved Oxygen (DO) on 4, 8, 9, 10, 11 and 12 September 2008 and exceedances of the Action Limit Level for Bottom DO were found on 9, 10, 11 and 12 September 2008. Exceedances of Action Level of Suspended Solids were also found on 4 and 18 September 2008.

Following review of data in accordance with the procedures specified with the *EM&A Manual*, these exceedances were considered likely due to natural fluctuations in water quality from the Pearl River discharge rather than through Project Works.

Complaint Log

No environmental complaints were received during the reporting period.

Notifications of any Summons and Successful Prosecutions

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

Future Key Issues

- Dust release and suppression; and,
- Backfilling of rock armour over the pipelines.

Conclusion

Water quality at the vicinity of the project area during construction 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. A further Variation to the Environmental Permit has been approved 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 9 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 9 July 2007, this is the **second** EM&A Report which summarizes the monitoring results and audit findings for the EM&A programme during the reporting period from **1 July 2008 to 30 June 2009**.

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				
Anthony Wong	Assistant General Manager Aviation Logistics	2183 3099	2824 2786	anthony.wong@hkairport.com
Contractor - Leighton (Asia) Construction Limited				
Brian Gillon	Project Director	2823 1111	2529 8784	brian.gillon@leightonasia.com
Boyd Merrett	Project Manager	2404 8900	2404 0081	boyd.merrett@leightonasia.com
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 Guiyi Li	Independent Environmental Checker	2911 2233	2805 5028	guiyi.li@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*. Marine dredging operations were completed on 23 January 2009. *Table 2.2* presented the cumulative quantity of excavated materials up to that date. The cumulative dredging volume during the reporting period was presented in *Figure 2.1*.

Table 2.1 Summary of Works Undertaken up to 30 June 2009

Area	Works undertaken
Tuen Mun Area 38	<ul style="list-style-type: none">• Tank Farm and Bund Wall Construction• Permanent Drainage Construction• Operational & Fire Services Buildings Construction• Minor Jetty Works (Non-piling)
Submarine Pipeline Route	<ul style="list-style-type: none">• Dredging Operations• Completion of installation of main submarine pipeline• Riser connections at seawall and Sha Chau• Backfilling and placing of rock armour over the pipelines

Table 2.2 Cumulative Quantity of Excavated Materials up to 30 June 2009

Type of Excavated Materials	Cumulative Bulk Volume (m ³)
<i>From 17 December 2007 to 31 March 2008</i>	
Contaminated Mud	105,974
Uncontaminated Mud	97,815
<i>From 1 September 2008 to 23 January 2009</i>	
Contaminated Mud	0
Uncontaminated Mud	149,147

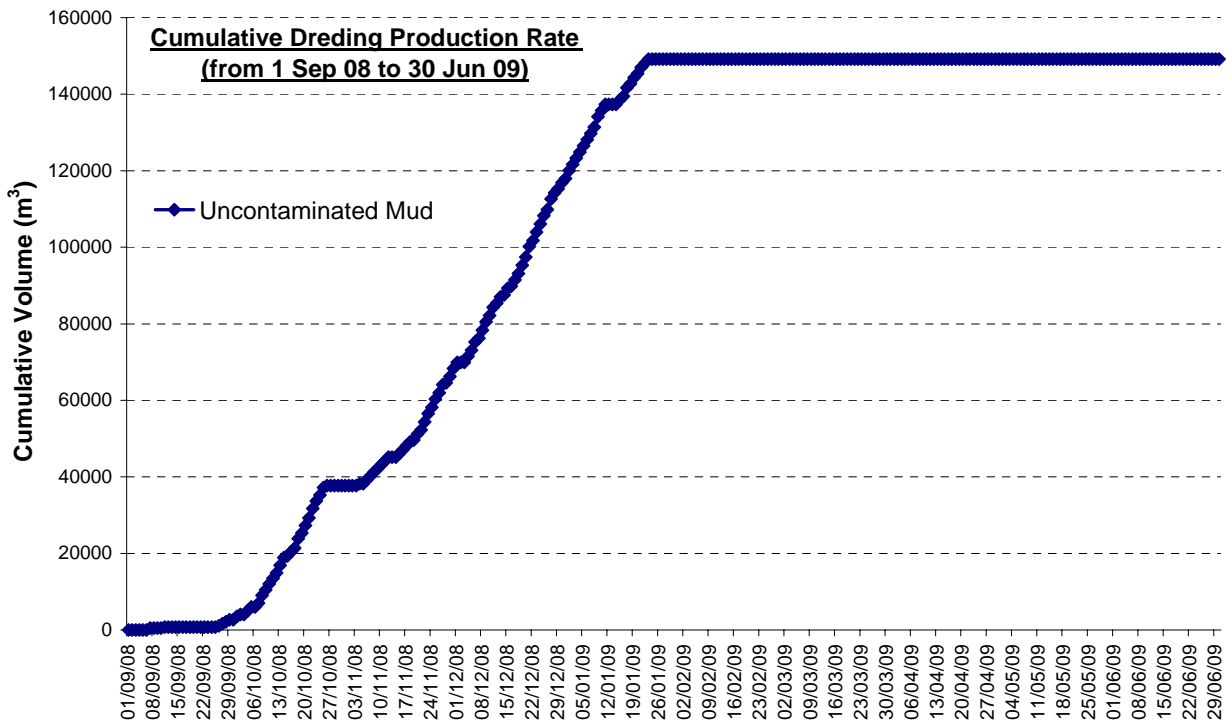
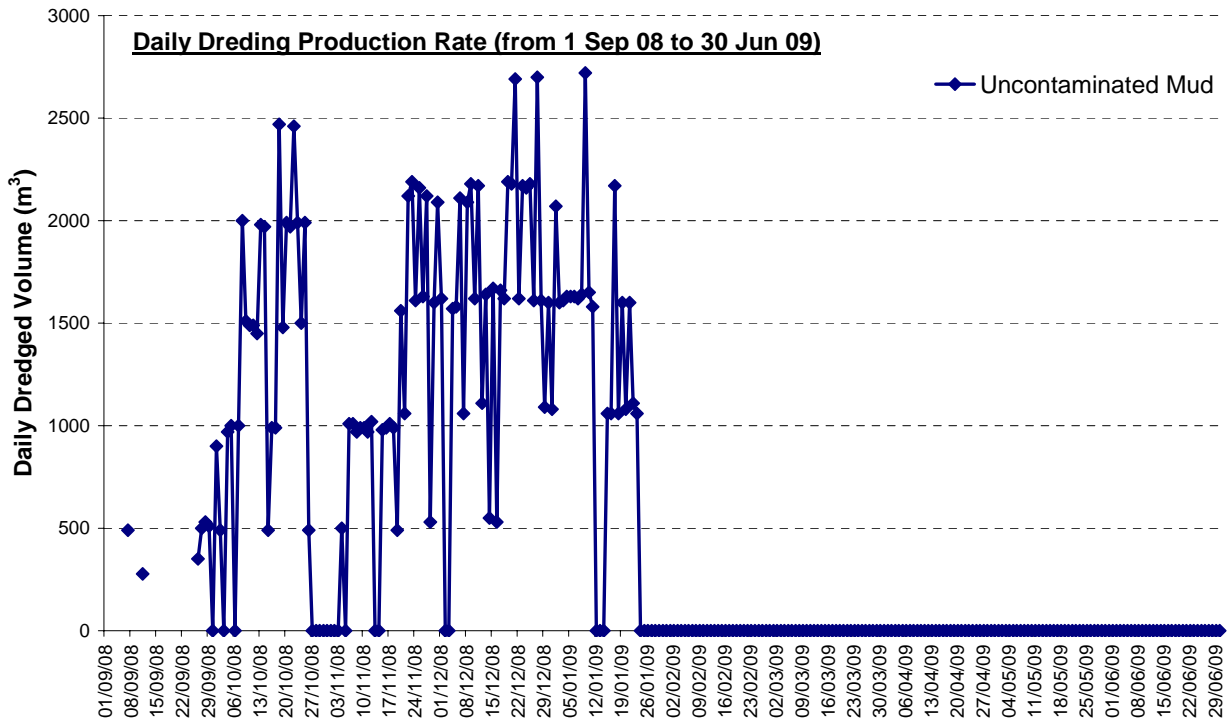


Figure 2.1 Daily and cumulative volumes (m³) of excavated materials from 1 September to 30 June 2009. Excavated materials contained uncontaminated mud only.



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 1 September 2008 to 23 January 2009.

2.5

STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

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 30 June 2009*

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-RW0676-07</i>	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
	<i>GW-RW0677-07</i>	21 December 2007 to 29 February 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
	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
	GW-RW0312-08	04 July 2008 to 22 December 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-RW0313-08	04 July 2008 to 19 December 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-RW0373-08	1 August 2008 to 20 January 2009	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, generators, stirrer, jet chisel, water jet machine and dehumidifier
	GW-RW0368-08	1 September to 30 November 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
	GW-RW0054-09	16 February 2009 to 5 August 2009	For land-based and marine works including passenger launch, winch, welding machine, grinder, generator, power pack, tug boat, crane, air compressor, roller, hoist and derrick barge
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
	EP/MD/09-018	1 September to 30 September 2008	For Type 1d & Type 2 marine disposal
	EP/MD/09-032	1 October to 31 October 2008	For Type 1d & Type 2 marine disposal
	EP/MD/09-017	1 September to 30 November 2008	For Type 1 - Open Sea Disposal
	EP/MD/09-039	1 December 2008 to 31 January 2009	For Type 1 - Open Sea Disposal
Wastewater Discharge License	EP760/421/011399/1	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 2009, the CLG held meetings on 10 September 2009, 3 December 2009, 12 March 2009 and 10 June 2009.

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>).

SUMMARY OF NON-COMPLIANCE WITH THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

Summary of Environmental Non-compliance

Water quality monitoring during dredging activities recorded exceedances of the Action Limit Level for Depth-averaged Dissolved Oxygen (DO) on 4, 8, 9, 10, 11 and 12 September 2008. There were exceedances of the Action Limit Level for Bottom DO on 9, 10, 11 and 12 September 2008. Exceedances of Action Level of Suspended Solids were found on 4 and 18 September 2008.

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

Summary of Environmental Complaints

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

Summary of Environmental Summons

No summons were 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
Stagnant water pools were observed at some locations on site (eg tank farm, chemical waste storage).	The Contractor was reminded to arrange ad hoc water clearance as necessary.
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:

- Exceedances of the Action Limit Level for depth-averaged DO were also found on 8 September when no dredging was undertaken. These values were comparable to those of days with dredging operations; and,
- Depth-averaged turbidity did not show the same trend of exceedances indicating no potential relationship to a sediment plume generated by dredging activities

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 ebb and flood tides, DO 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 DO and SS observed in the Pearl River Estuary.

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 ENVIRONMENTAL MONITORING

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 1 September 2008 to 23 January 2009. Monitoring data and graphical presentations of the results are included in *Annex F*.

Results of the monitoring demonstrated that all measured turbidity levels of all Impact Stations were below the Action and Limit (AL) Levels specified in the *EM&A Manual*. Concentrations of Suspended Solids (SS) were also generally below AL Levels, however, exceedances were noted for 4 and 18 September 2008. Depth-averaged Dissolved Oxygen (DO) did not comply with AL Levels on 4, 8, 9, 10, 11 and 12 September 2008 while Bottom DO did not comply with AL Levels on 9, 10, 11 and 12 September 2008. 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 1 September 2008 to 23 January 2009. All POPs parameters (ie total Polychlorinated Biphenyls (PCBs), total Dichloro-Diphenyl-Trichloroethane (DDTs) and total Polycyclic Aromatic Hydrocarbons (PAHs)) were below detection limits. Monitoring results and QA/QC reports for POPs testing are presented in *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. The revised WMP has been certified by the ET and IEC.

4.1.4 *Cultural Heritage*

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*

The ET and IEC verified updated design audit plan was submitted to the EPD on 7 November 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 1 September 2008 to 23 January 2009.

During the reporting period, 30 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 16 January 2009 and was submitted to the EPD on 1 April 2009.

4.1.9 *Baseline Water Quality Monitoring*

The *Final Baseline Monitoring Report* was submitted to the EPD on 20 February 2008 and placed under the EIAO register.

Dredging operation was carried out for pipeline installation during the period from 1 September 2008 to 23 January 2009. 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 not observed.*

Stations	Suspended Solid Concentrations (mg/L)						
	Baseline monitoring (Average)	EIA Prediction (Baseline values x 130%)	Impact Monitoring (Average)				
			Sep 08	Oct 08	Nov 08	Dec 08	Jan 09
MPB1	13.76	17.89	9.00	6.51	7.83	6.16	7.34
MPB2	14.57	18.94	8.54	6.81	8.01	6.30	7.72
MP	13.33	17.33	8.60	6.73	7.47	6.03	7.35
IMO1*	11.81	15.35	9.66	6.97	7.81	6.32	7.34
IMO2*	11.81	15.35	8.29	6.68	7.50	6.26	7.30

*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 not observed.*

Stations	Suspended Solid Concentrations (mg/L)						
	Baseline monitoring (Average)	EIA Prediction (Baseline values x 130%)	Impact Monitoring (Average)				
			Sep 08	Oct 08	Nov 08	Dec 08	Jan 09
MPB1	13.50	17.55	9.40	6.81	7.94	6.16	6.86
MPB2	18.31	23.80	8.36	6.57	7.82	6.20	7.04
MP	10.86	14.11	9.90	6.77	7.30	6.11	7.10
IMO1*	13.21	17.17	8.42	6.83	7.47	6.11	7.50
IMO2*	13.21	17.17	9.39	7.01	7.49	6.10	7.18

*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 both mid-ebb and mid-flood did not exceed 130% of the baseline levels, which was in line with previous predictions. This implied that dredging activities did not cause unacceptable elevations of SS in water.

6 *FUTURE KEY ISSUES AND CONCLUSION*

6.1 *KEY ISSUES FOR THE NEXT REPORTING PERIOD*

Key issues to be considered in the next reporting period will be:

- dust release and suppression from on-site works;
- backfilling of rock armour over pipelines.

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 backfilling works. Weekly site inspections will be undertaken by the ET as per the EM&A requirements.

It is expected that the majority of the remaining construction works will be completed by June 2010 and pre-commissioning works such as hydrotesting and electricity/mechanical checks will commence in March 2010.

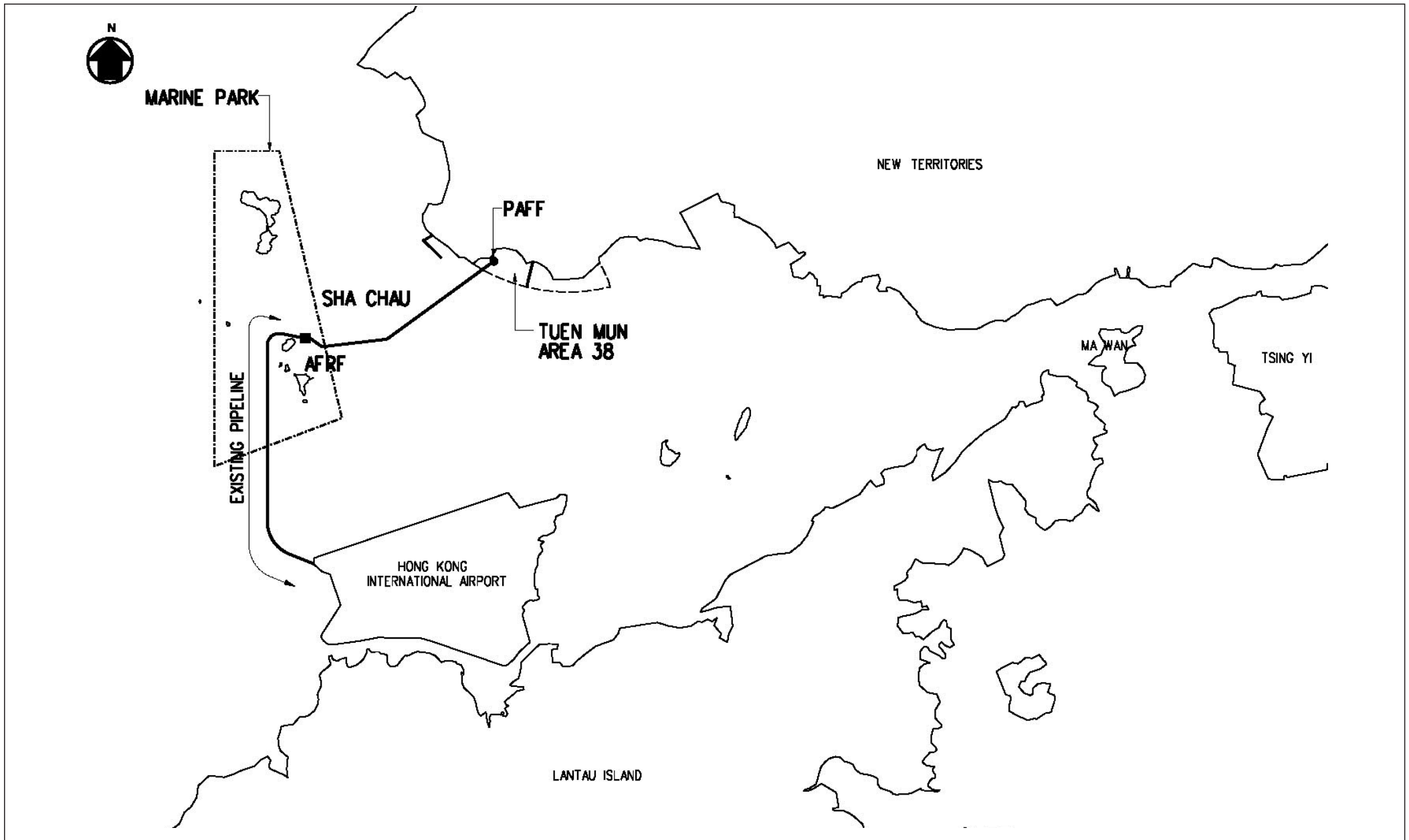
6.4 *CONCLUSION*

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)

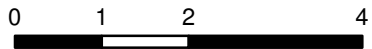
MPB1

MPB2

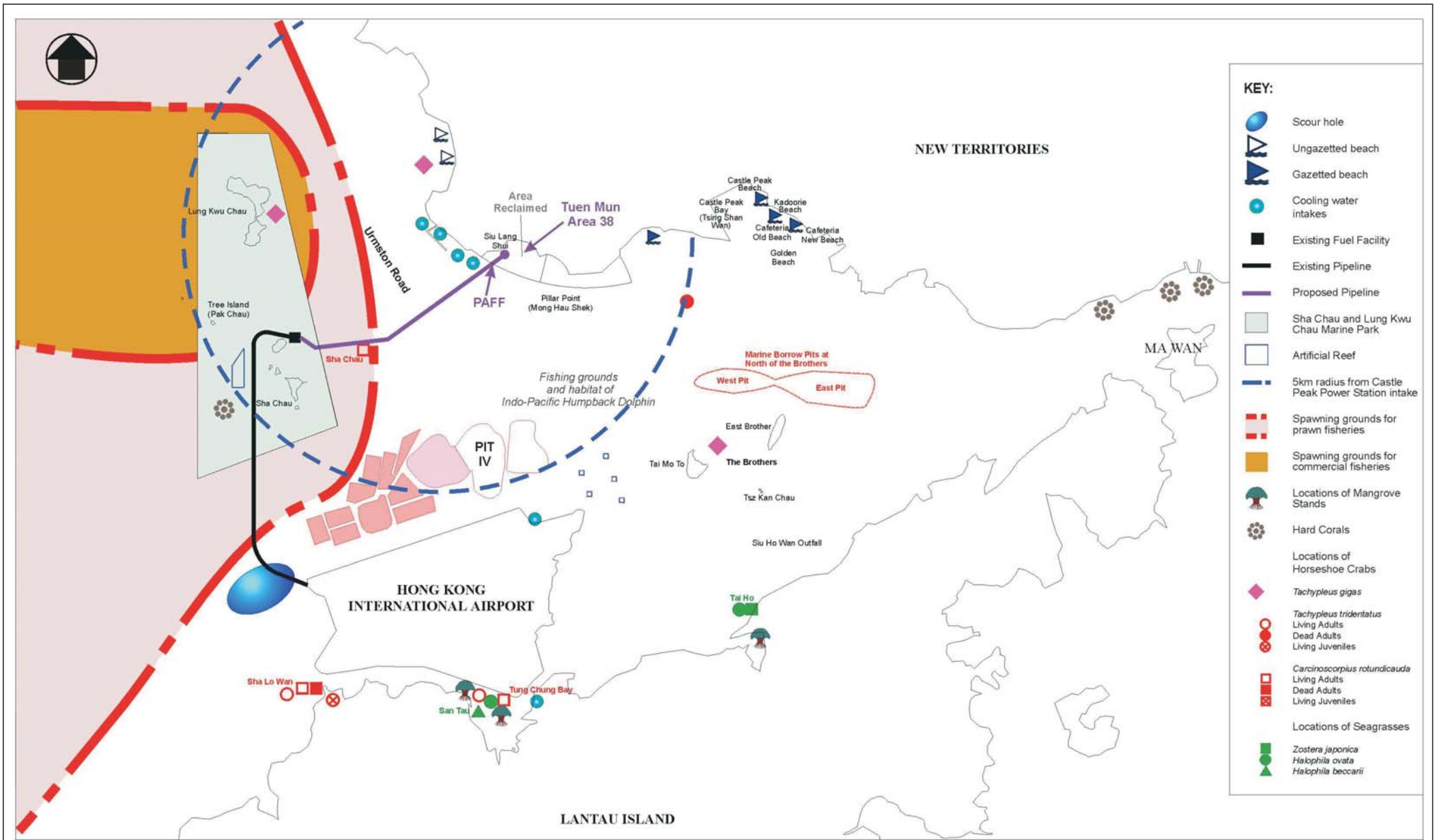
C3 (NM6)



Kilometers



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 ARFR Marine access channel	Airport Authority	TMEIA		Y		N/A	Completed
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	Completed
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	Completed
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	Completed
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	Completed

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	Completed
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	Completed
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	Completed
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	Completed
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	Completed

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	Ongoing
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	Ongoing
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	Completed
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 prior to 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 500m 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	Completed
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	Completed
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 recessive 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	Completed

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	Not applicable
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	Not applicable
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.	Prior to the start of operation of the PAFF with audits every 12 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	Completed
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

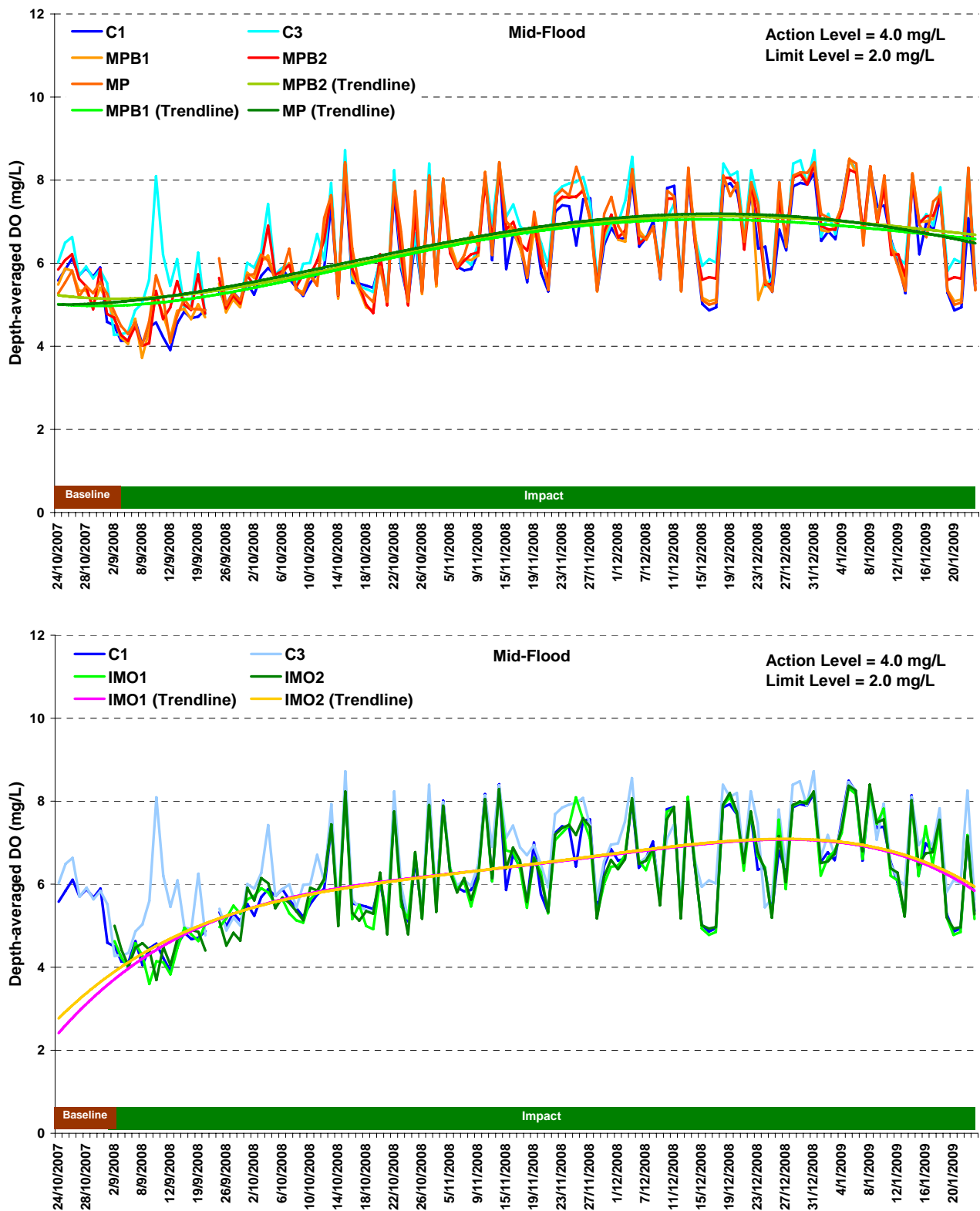


Figure G1 Dissolved oxygen concentration (depth-averaged) (mg/L) of water samples from the seven sampling locations at mid-flood between 1 September 2008 and 23 January 2009.

Ref: 0018105_Annex G_water graphs.doc



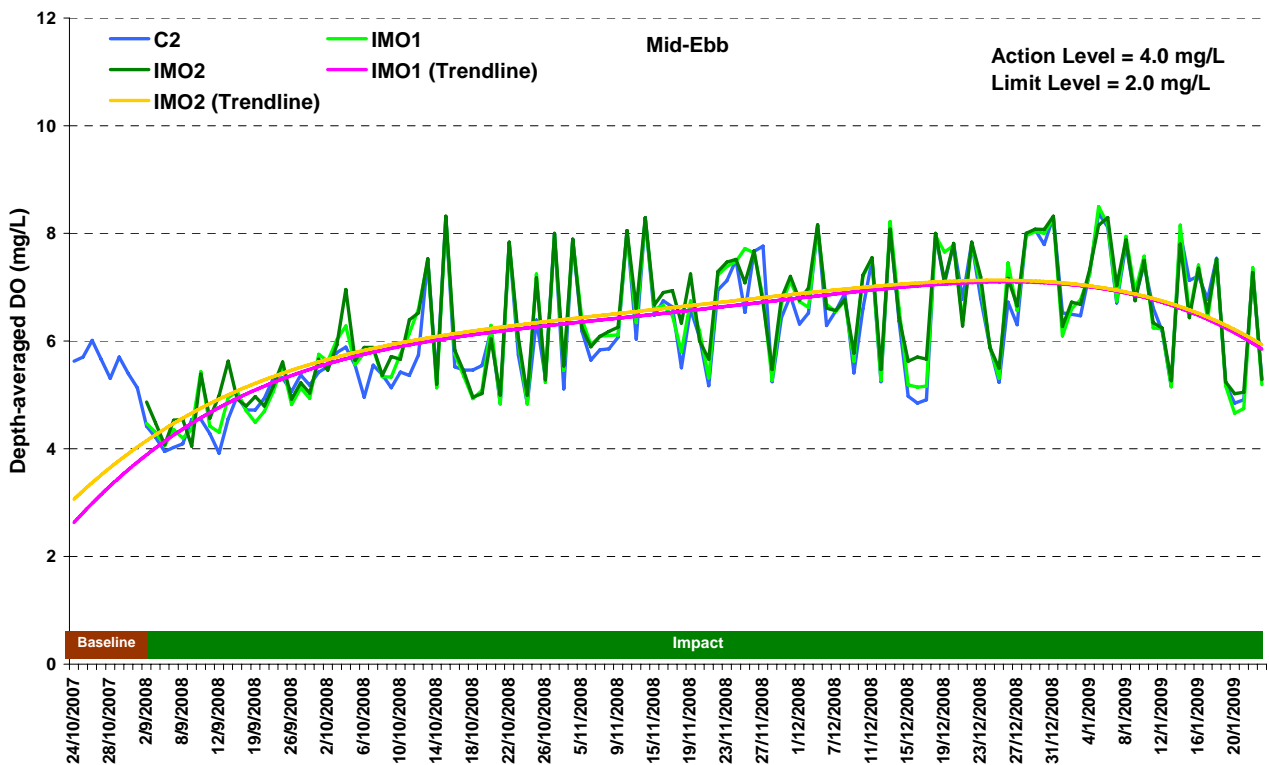
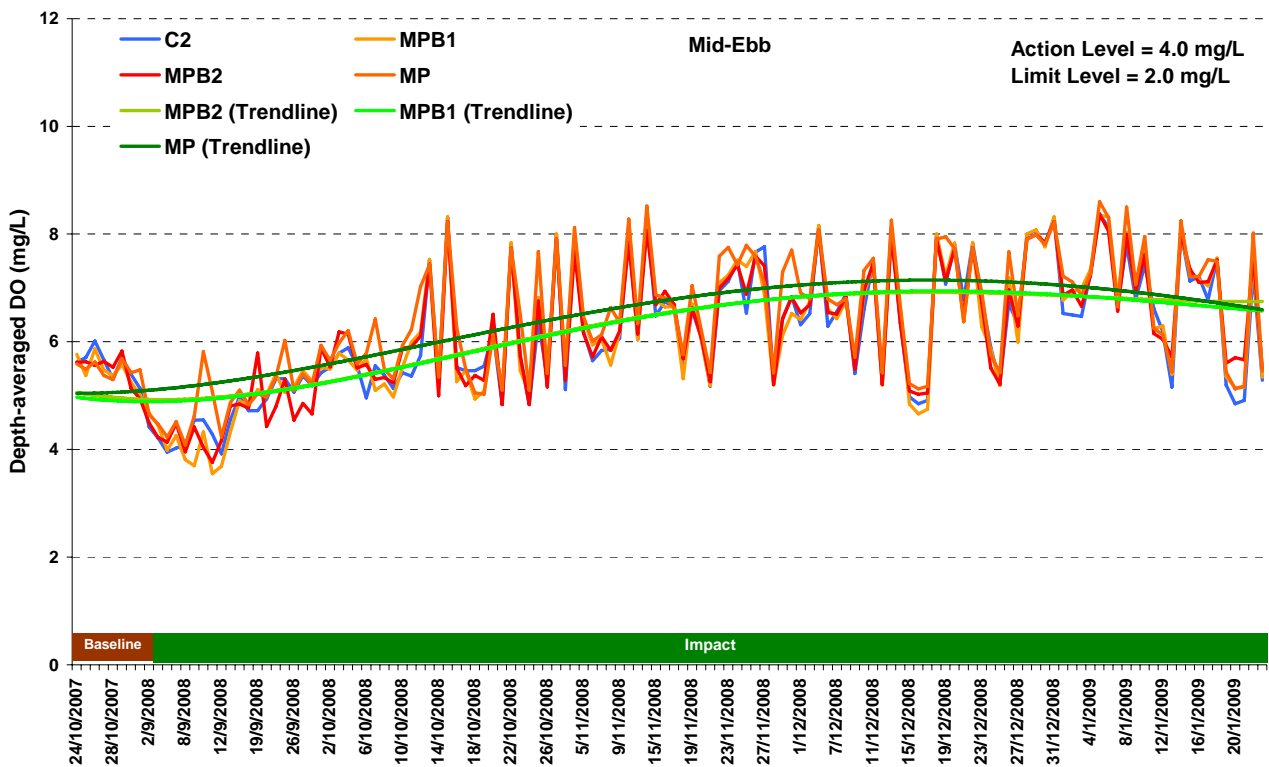


Figure G2 Dissolved oxygen concentration (depth-averaged) (mg/L) of water samples from the six sampling locations at mid-ebb between 1 September 2008 and 23 January 2009.

Ref: 0018105_Annex G_water graphs.doc



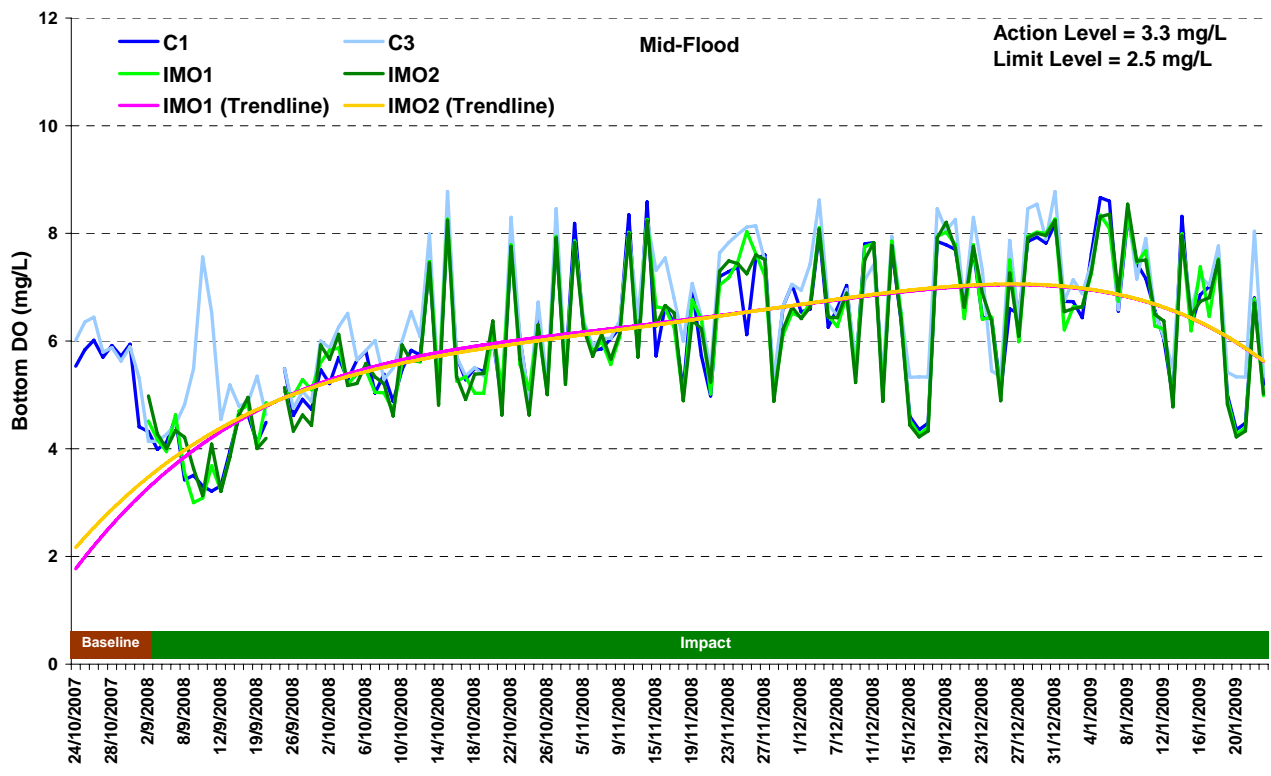
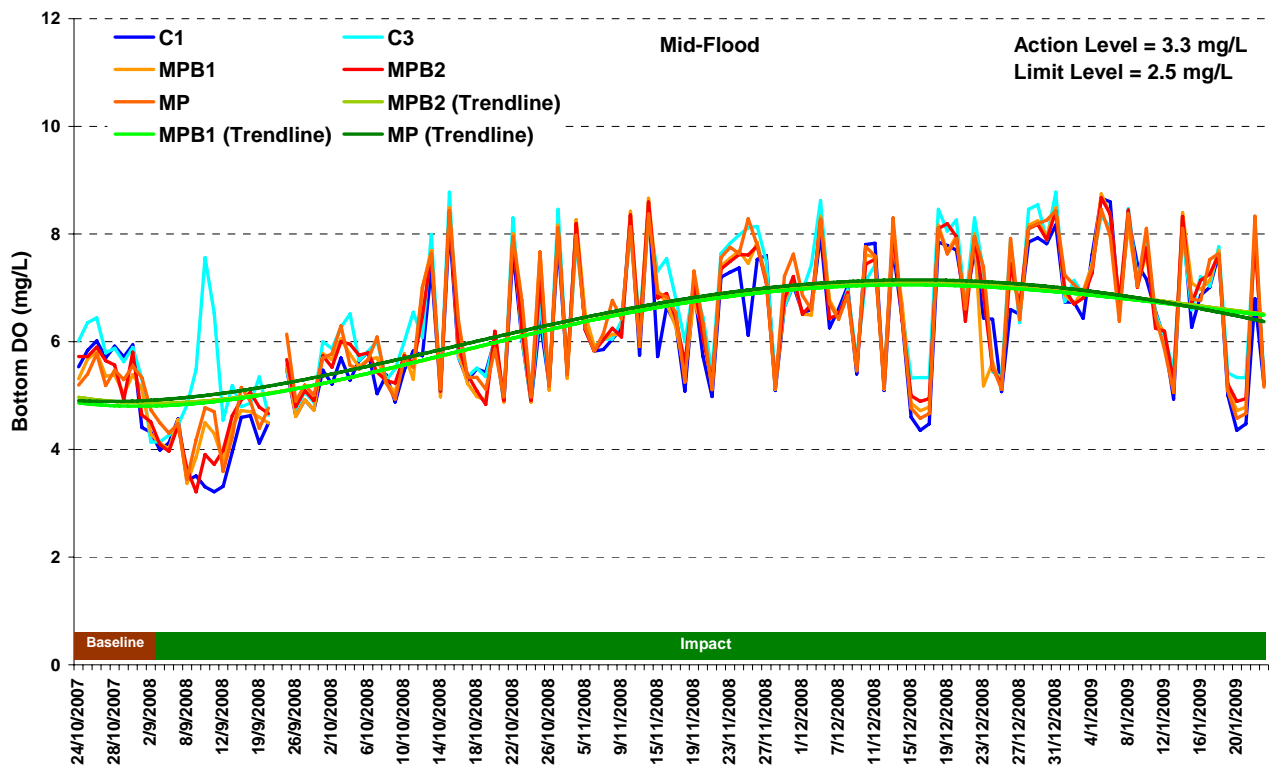


Figure G3 Dissolved oxygen concentration (bottom) (mg/L) of water samples from the seven sampling locations at mid-flood between 1 September 2008 and 23 January 2009.



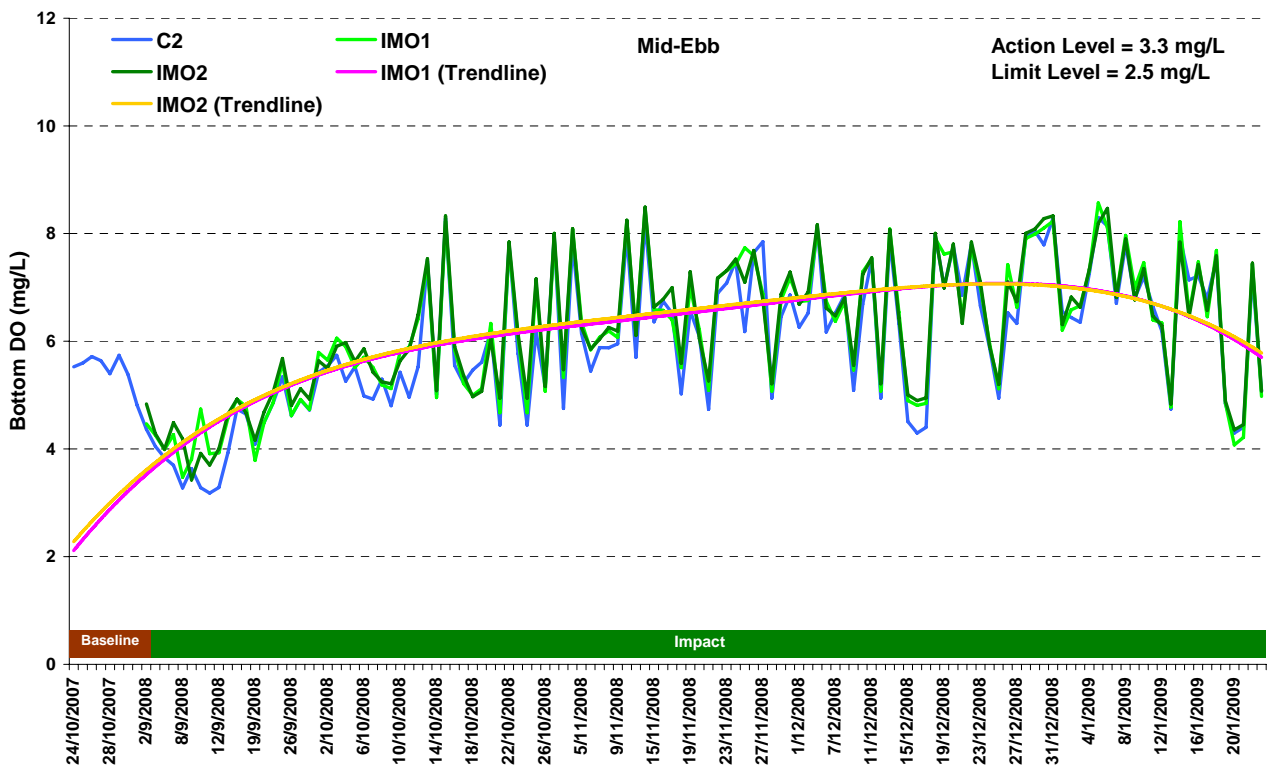
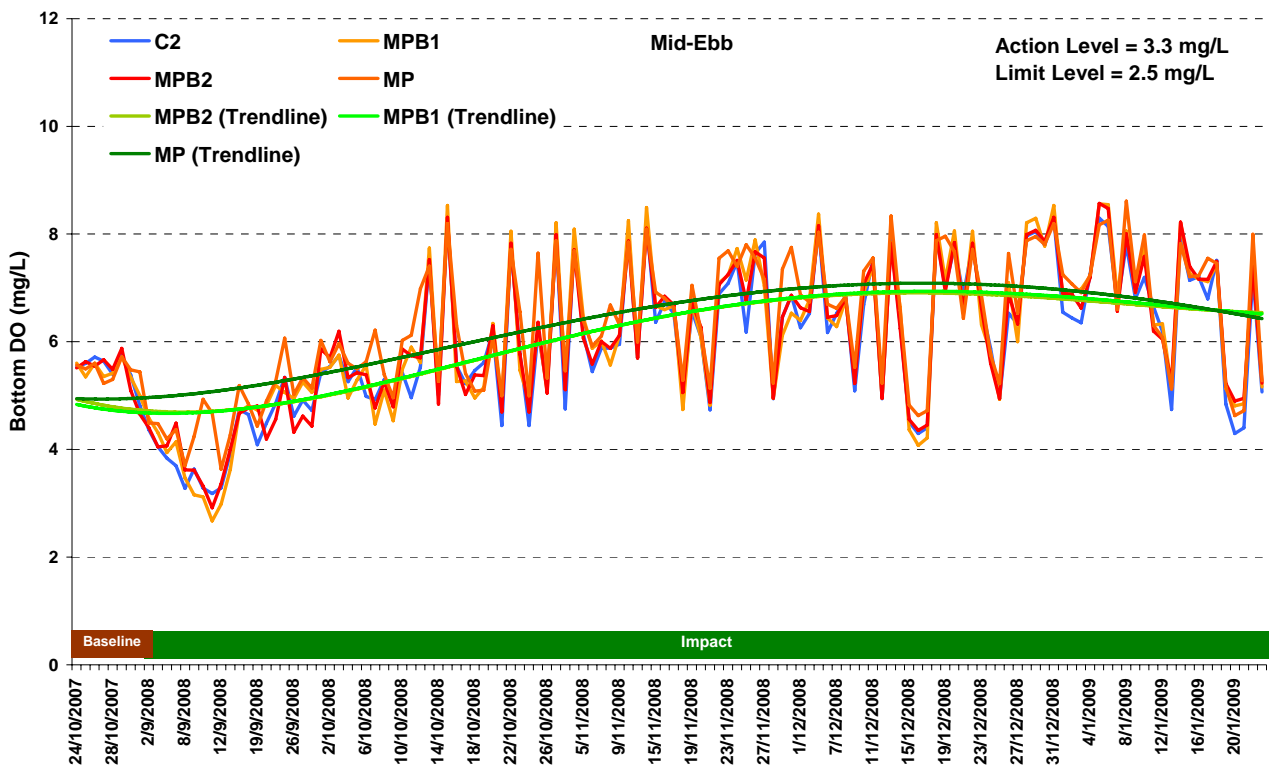


Figure G4 Dissolved oxygen concentration (bottom) (mg/L) of water samples from the six sampling locations at mid-ebb between 1 September 2008 and 23 January 2009.



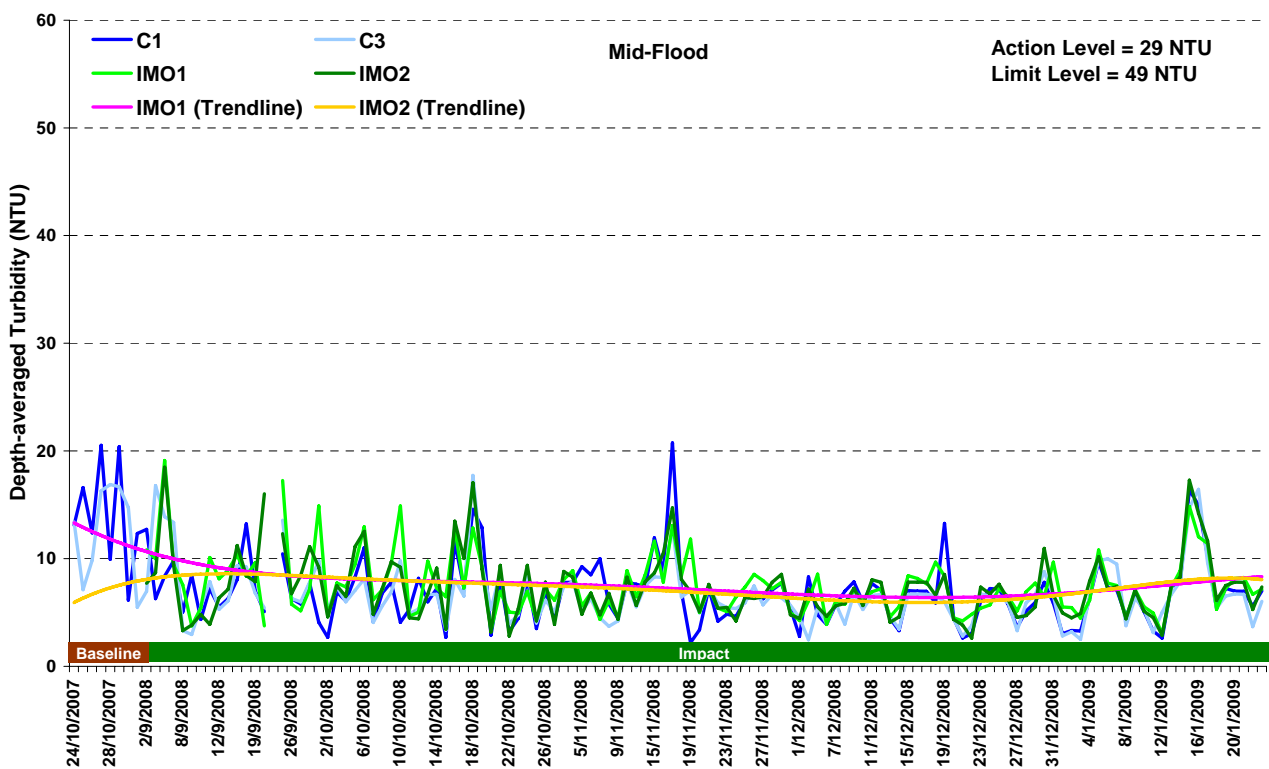
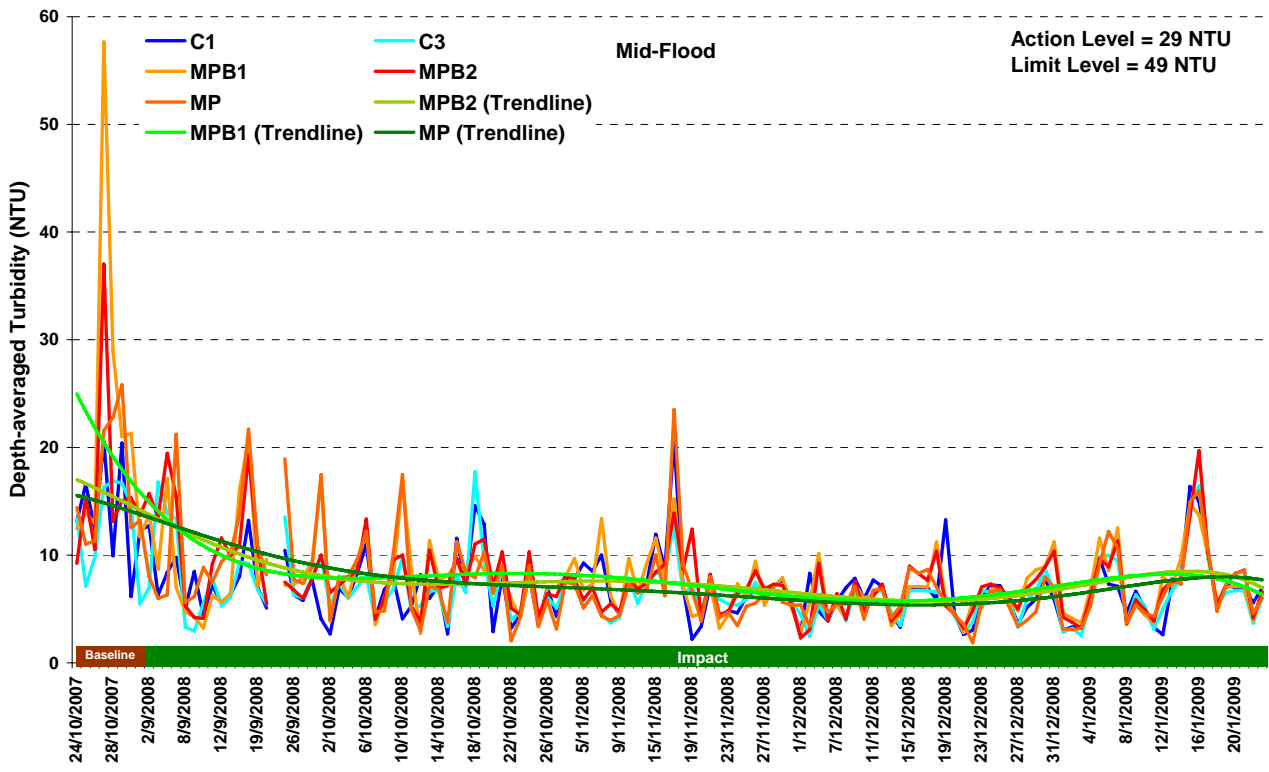


Figure G5 Depth-averaged turbidity (NTU) of water samples from the seven sampling locations at mid-flood between 1 September 2008 and 23 January 2009.



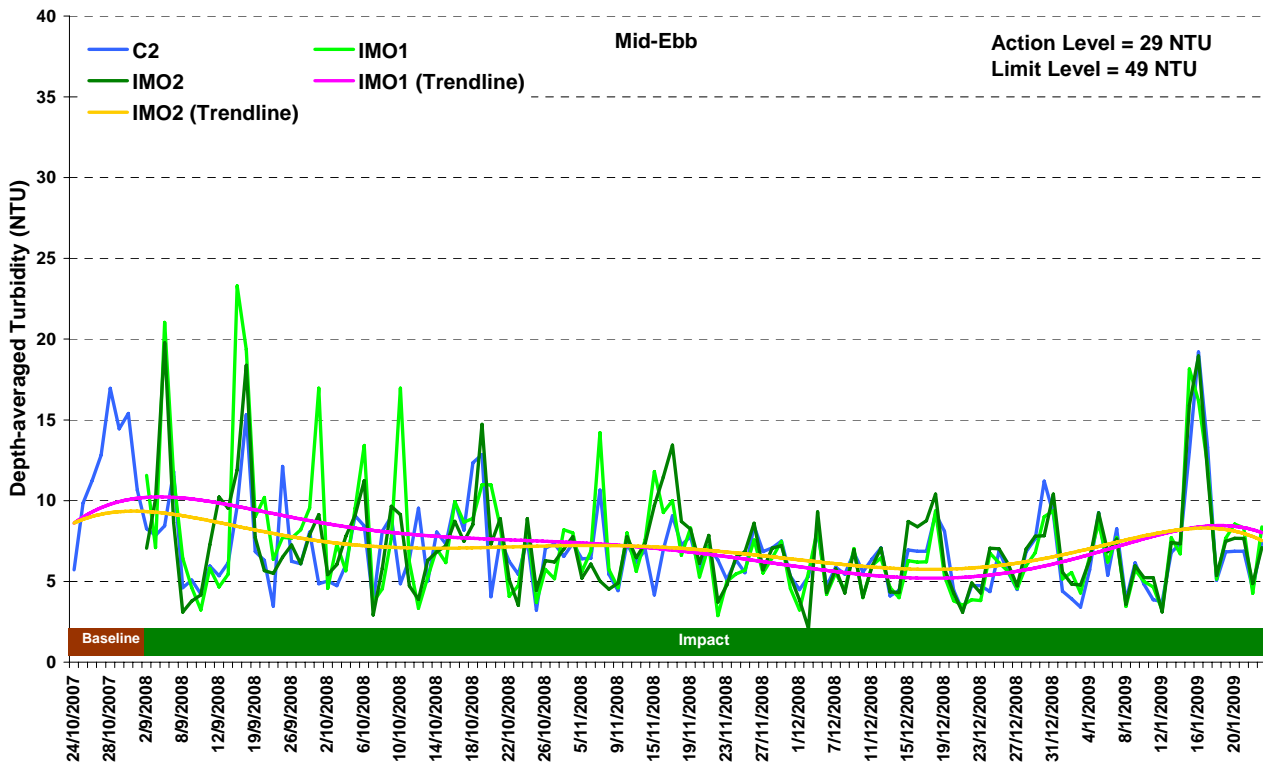
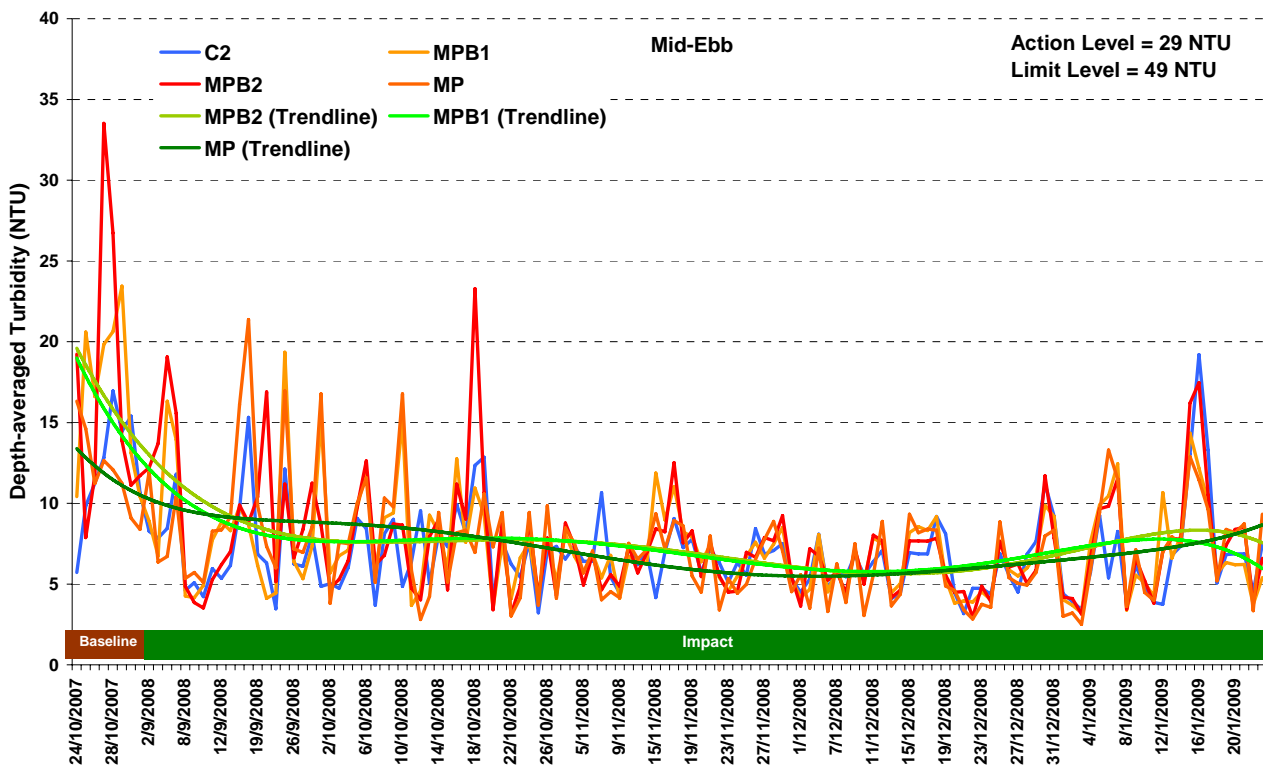


Figure G5 Depth-averaged turbidity (NTU) of water samples from the six sampling locations at mid-ebb between 1 September 2008 and 23 January 2009.



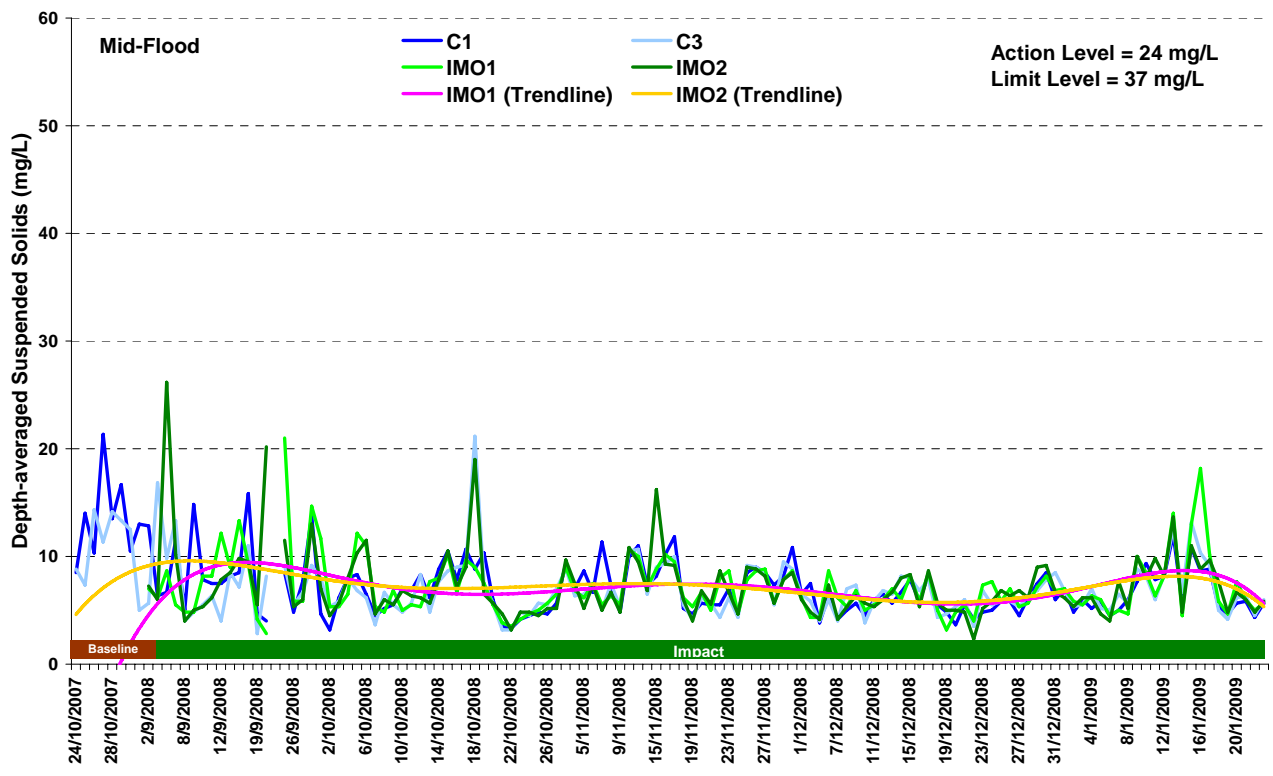
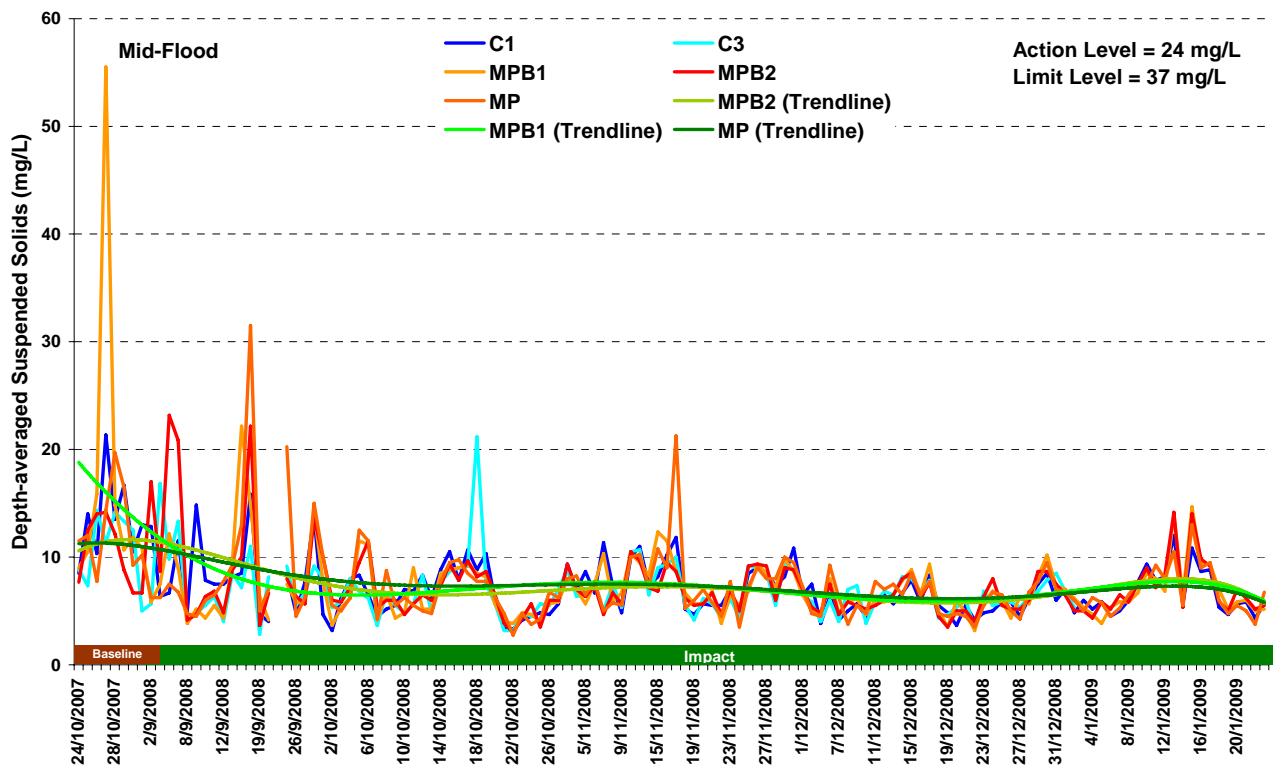


Figure G4 Depth-averaged suspended solids concentration (mg/L) of water samples from the seven sampling locations at mid-flood between 1 September 2008 and 23 January 2009.



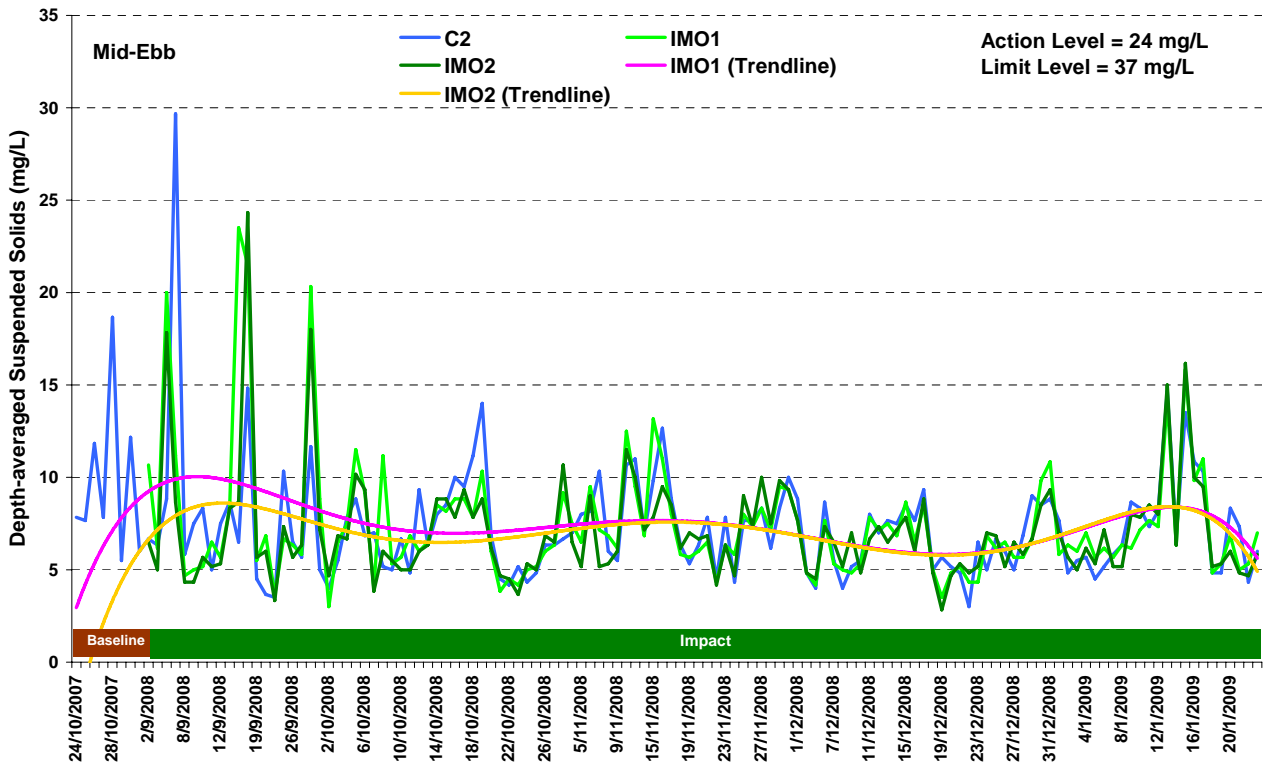
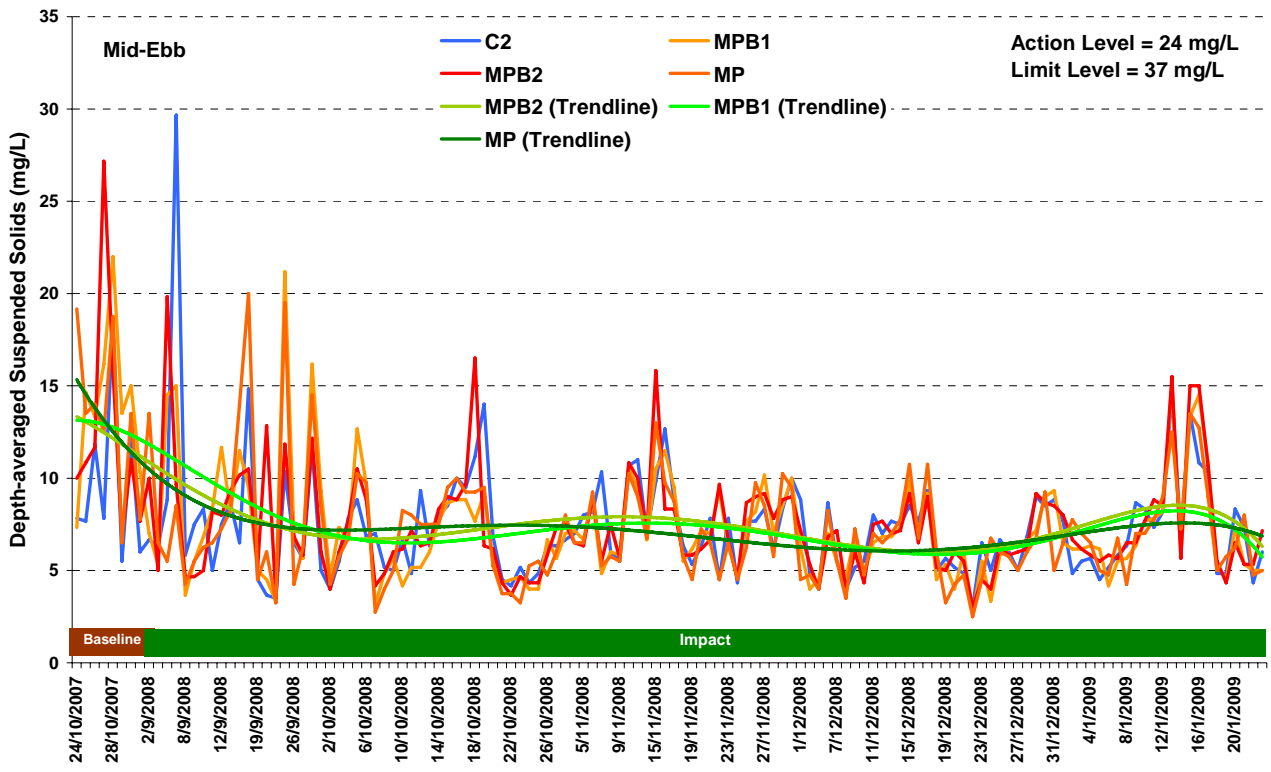


Figure G4 Depth-averaged suspended solids concentration (mg/L) of water samples from the six sampling locations at mid-ebb between 1 September 2008 and 23 January 2009.



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 500m exclusion (A) prior to dredging and (B) during dredging

** Sighting recorded when there is no dredging

Week	Date		Dredger 1		Observers' Names	
			No. of Dolphin Occurrence*	Sighting No.		
1	Mon	01-Sep	No Dredging	-	Richard Huang	
	Tue	02-Sep	15	1-7	Anton Tsang	
	Wed	03-Sep	2	8	Anton Tsang	
	Thu	04-Sep	2	9	Richard Huang	
	Fri	05-Sep	1	10	Anton Tsang	
	Sat	06-Sep	No Dredging			
	Sun	07-Sep	No Dredging			
2	Mon	08-Sep	No Dredging		Richard Huang	
	Tue	09-Sep	0	-	Anton Tsang	
	Wed	10-Sep	0	-	Anton Tsang	
	Thu	11-Sep	0	-	Richard Huang	
	Fri	12-Sep	0	-	Anton Tsang	
	Sat	13-Sep	No Dredging			
	Sun	14-Sep	No Dredging			
3	Mon	15-Sep	No Dredging			
	Tue	16-Sep	0	-	Richard Huang	
	Wed	17-Sep	0	-	Anton Tsang	
	Thu	18-Sep	0	-	Richard Huang	
	Fri	19-Sep	0	-	Anton Tsang	
	Sat	20-Sep	No Dredging			
	Sun	21-Sep	No Dredging			
4	Mon	22-Sep	No Dredging	-	Ivy So	
	Tue	23-Sep	No Dredging	-	Anton Tsang	
	Wed	24-Sep	Typhoon		No Monitoring	
	Thu	25-Sep	0	-	Richard Huang	
	Fri	26-Sep	0	-	Ivy So	
	Sat	27-Sep	No Dredging			
	Sun	28-Sep	No Dredging			

5	Mon	29-Sep	0	-	Ivy So
	Tue	30-Sep	4	11	Ivy So
	Wed	01-Oct	0	-	Richard Huang
	Thu	02-Oct	0	-	Ivy So
	Fri	03-Oct	0	-	Ivy So
	Sat	04-Oct	0	-	Ivy So
	Sun	05-Oct	0	-	Richard Huang
6	Mon	06-Oct	0	-	Ivy So
	Tue	07-Oct	0	-	Richard Huang
	Wed	08-Oct	0	-	Ivy So
	Thu	09-Oct	4	12-13	Ivy So
	Fri	10-Oct	0	-	Ivy So
	Sat	11-Oct	3	14	Ivy So
	Sun	12-Oct	1	15	Richard Huang
7	Mon	13-Oct	3	16	Ivy So
	Tue	14-Oct	0	-	Ivy So
	Wed	15-Oct	No Dredging	-	Ivy So
	Thu	16-Oct	0	-	Chung
	Fri	17-Oct	0	-	Ivy So
	Sat	18-Oct	0	-	Ivy So
	Sun	19-Oct	2	17	Richard Huang
8	Mon	20-Oct	0	-	Ivy So
	Tue	21-Oct	0	-	Ivy So
	Wed	22-Oct	5	18-20	Ivy So
	Thu	23-Oct	0	-	Richard Huang
	Fri	24-Oct	0	-	Ivy So
	Sat	25-Oct	0	-	Ivy So
	Sun	26-Oct	0	-	Richard Huang

9	Mon	27-Oct	No Dredging	-	No Monitoring
	Tue	28-Oct	No Dredging	-	Ivy So
	Wed	29-Oct	No Dredging	-	No Monitoring
	Thu	30-Oct	No Dredging	-	No Monitoring
	Fri	31-Oct	No Dredging	-	Ivy So
	Sat	01-Nov	No Dredging	-	No Monitoring
	Sun	02-Nov	No Dredging	-	No Monitoring
10	Mon	03-Nov	No Dredging	-	No Monitoring
	Tue	04-Nov	No Dredging	-	No Monitoring
	Wed	05-Nov	No Dredging	-	Anton Tsang
	Thu	06-Nov	0	-	Richard Huang
	Fri	07-Nov	1	21-22	Anton Tsang
	Sat	08-Nov	No Dredging	-	Ivy So
	Sun	09-Nov	0	-	Richard Huang
11	Mon	10-Nov	1	23	Anton Tsang
	Tue	11-Nov	1	24	Anton Tsang
	Wed	12-Nov	0	-	Anton Tsang
	Thu	13-Nov	No Dredging	-	No Monitoring
	Fri	14-Nov	No Dredging	-	No Monitoring
	Sat	15-Nov	0	-	Ivy So
	Sun	16-Nov	1	25	Richard Huang
12	Mon	17-Nov	0	-	Anton Tsang
	Tue	18-Nov	0	-	Anton Tsang
	Wed	19-Nov	0	-	Anton Tsang
	Thu	20-Nov	0	-	Richard Huang
	Fri	21-Nov	11	26	Anton Tsang
	Sat	22-Nov	1	27	Ivy So
	Sun	23-Nov	0	-	Richard Huang

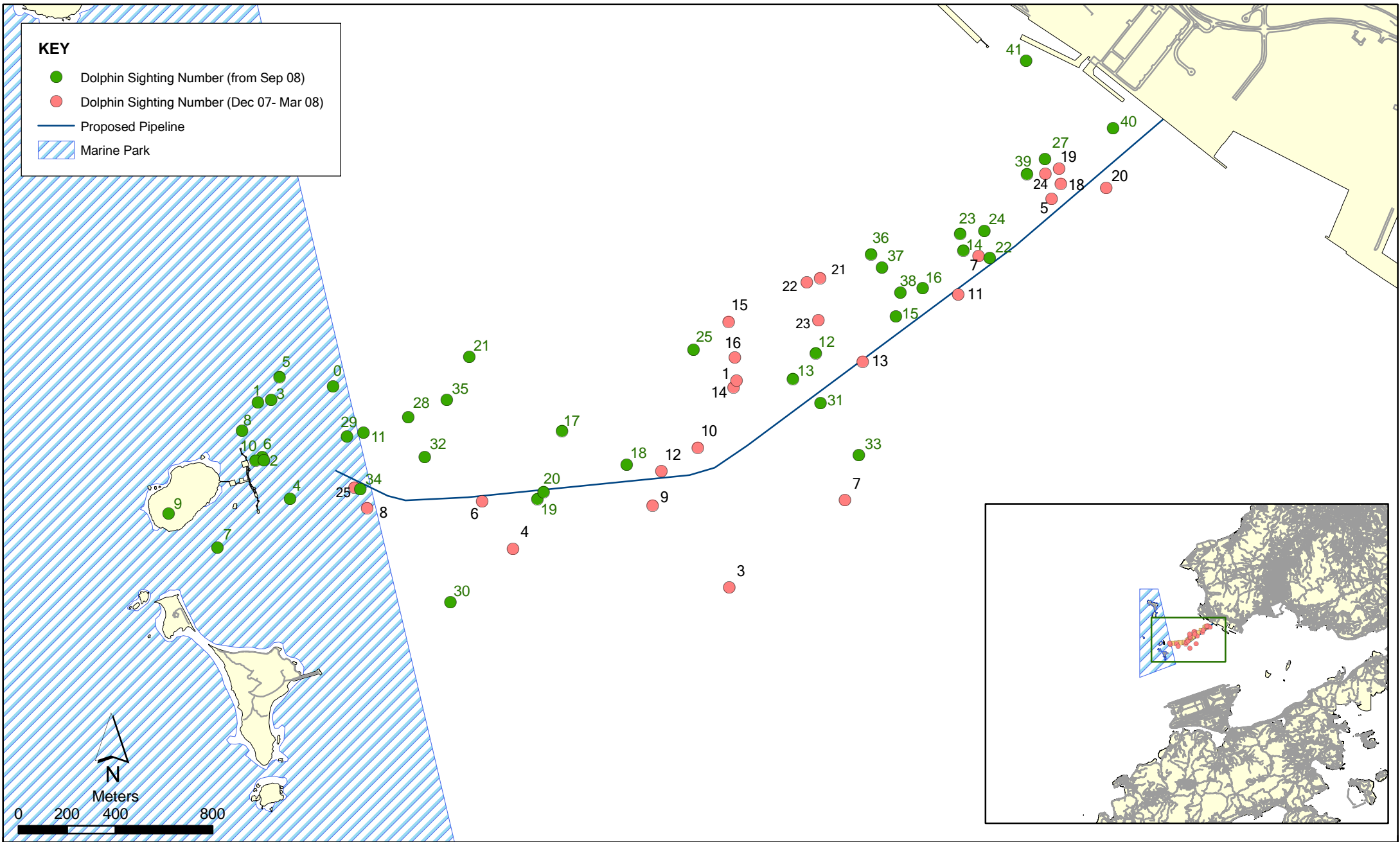
13	Mon	24-Nov	4	28-29	Anton Tsang
	Tue	25-Nov	0	-	Anton Tsang
	Wed	26-Nov	0	-	Anton Tsang
	Thu	27-Nov	0	-	Richard Huang
	Fri	28-Nov	0	-	Anton Tsang
	Sat	29-Nov	0	-	Ivy So
	Sun	30-Nov	0	-	Richard Huang
14	Mon	01-Dec	0	-	Anton Tsang
	Tue	02-Dec	No Dredging	-	No Monitoring
	Wed	03-Dec	No Dredging	-	No Monitoring
	Thu	04-Dec	3	30	Ivy So
	Fri	05-Dec	2	31	Ivy So
	Sat	06-Dec	0	-	Ivy So
	Sun	07-Dec	3	32	Ivy So
15	Mon	08-Dec	2	33	Anton Tsang
	Tue	09-Dec	0	-	Anton Tsang
	Wed	10-Dec	0	-	Richard Huang
	Thu	11-Dec	0	-	Ivy So
	Fri	12-Dec	1	34	Anton Tsang
	Sat	13-Dec	1	35	Ivy So
	Sun	14-Dec	0	-	Ivy So
16	Mon	15-Dec	2	36-37	Ivy So
	Tue	16-Dec	0	-	Anton Tsang
	Wed	17-Dec	1	38	Richard Huang
	Thu	18-Dec	0	-	Ivy So
	Fri	19-Dec	0	-	Anton Tsang
	Sat	20-Dec	0	-	Ivy So
	Sun	21-Dec	0	-	Richard Huang
17	Mon	22-Dec	0	-	Anton Tsang
	Tue	23-Dec	0	-	Anton Tsang
	Wed	24-Dec	0	-	Richard Huang
	Thu	25-Dec	0	-	Ivy So

	Fri	26-Dec	0	-	Ivy So
	Sat	27-Dec	0	-	Ivy So
	Sun	28-Dec	0	-	Richard Huang
18	Mon	29-Dec	0	-	Anton Tsang
	Tue	30-Dec	0	-	Anton Tsang
	Wed	31-Dec	0	-	Richard Huang
	Thu	01-Jan	1	39	Richard Huang
	Fri	02-Jan	0	-	Anton Tsang
	Sat	03-Jan	0	-	Richard Huang
	Sun	04-Jan	0	-	Richard Huang
19	Mon	05-Jan	0	-	Anton Tsang
	Tue	06-Jan	0	-	Anton Tsang
	Wed	07-Jan	0	-	Richard Huang
	Thu	08-Jan	0	-	Ivy So
	Fri	09-Jan	0	-	Ivy So
	Sat	10-Jan	0	-	Richard Huang
	Sun	11-Jan	0	-	Richard Huang
20	Mon	12-Jan	0	-	Ivy So
	Tue	13-Jan	0	-	Ivy So
	Wed	14-Jan	1	40	Richard Huang
	Thu	15-Jan	2	41	Anton Tsang
	Fri	16-Jan	0	-	Anton Tsang
	Sat	17-Jan	0	-	Richard Huang
	Sun	18-Jan	0	-	Richard Huang
21	Mon	19-Jan	0	-	Anton Tsang
	Tue	20-Jan	0	-	Richard Huang
	Wed	21-Jan	0	-	Richard Huang
	Thu	22-Jan	0	-	Anton Tsang
	Fri	23-Jan	0	-	Anton Tsang

* Dolphin monitoring was not conducted from 24 Jan to 31 Jan 09 since there was no dredging operation

KEY

- Dolphin Sighting Number (from Sep 08)
- Dolphin Sighting Number (Dec 07- Mar 08)
- Proposed Pipeline
- ▨ Marine Park



Dolphin Sighting Locations (as of 31 January 2009)

Permanent Aviation Fuel Facility (PAFF) - Dolphin Sighting Records

Sighting No.	Date	Time	Chainage	Dredger Coordinates (N-Lat)	Dredger Coordinates (E-Long)	Sighting Distance (m)	#Sighting Angle from Dredging Machine (o)	Group size	Group Composition*	Beaufort	Boat Association	Behaviour	Other comments
1	2/9/2008	1000	4315	823838.545	806678.150	275	320	4	2UA, 1 SA, 1 SJ	1	None	Feeding, Travelling	Before Dredging
			4321	823840.556	806672.460								
2	2/9/2008	1024	4315	823838.545	806678.150	80	5	2	2UA	1	None	Breaching, Spy-hopping	Before Dredging
			4321	823840.556	806672.460								
3	2/9/2008	1035	4315	823838.545	806678.150	300	330	2	1UA, 1SA	1	None	Travelling	Before Dredging
			4321	823840.556	806672.460								
4	2/9/2008	1045	4315	823838.545	806678.150	220	75	3	1UA, 1SA, 1UJ	1	None	Travelling	Before Dredging
			4321	823840.556	806672.460								
5	2/9/2008	1108	4315	823838.546	806678.151	400	330	1	1SA	1	None	Travelling	Before Dredging
			4321	823840.557	806672.461								
6	2/9/2008	1411	4315	823838.547	806678.152	50	0	1	1UA	2	None	Travelling	During Dredging
			4321	823840.558	806672.462								
7	2/9/2008	1530	4315	823838.548	806678.153	350	150	2	2UA	2	None	Travelling	During Dredging
			4321	823840.559	806672.463								
8	3/9/2008	1535	4306	823841.180	806687.338	155	300	2	2UA	1	None	Travelling	During Dredging
			4300	823842.903	806693.345								
9	4/9/2008	1336	4306	823841.181	806687.339	380	190	2	2UA	2	None	Travelling	During Dredging
			4300	823842.904	806693.346								
10	5/9/2008	1711	4315	823838.546	806678.151	80	15	1	1UA	2	None	Travelling	Dredging Stopped
			4321	823840.557	806672.461								
11	30/9/2008	1050	3925	823794.421	807000.841	250	350	4	4UA	2	None	Travelling	Before Dredging
			4015	823867.660	806948.534								
12	9/10/2008	1001	1900	824212.899	808853.818	200	10	3	3UA	2	None	Travelling	During Dredging
			1925	824198.037	808833.716								
13	9/10/2008	1427	1925	824198.037	808833.716	100	35	1	1UA	3	None	Travelling	Before Dredging
			1970	824171.284	808797.532								
14	11/10/2008	0839	1175	824643.917	809436.783	220	15	3	3 UA	2	None	Travelling	Before Dredging
			1160	824652.835	809448.845								
15	12/10/2008	0839	1125	824673.643	809476.988	240	160	1	1UA	2	None	Travelling	During Dredging
			1170	824646.890	809440.804								
16	13/10/2008	0818	1030	824730.121	809553.376	170	160	3	1SS, 1 SA, 1 UA	2	None	Breaching, Feeding	Before Dredging
			1025	824733.094	809557.397								
17	19/10/2008	11:04	2730	823785.196	808154.203	270	270	2	2UA	2	None	Travelling	Dredger was moving
			2680	823792.332	808203.670								
18	22/10/2008	1420	3180	823757.391	807705.065	550	30	3	3 UA	2	None	Travelling	During Dredging
			3220	823754.942	807665.140								
19	22/10/2008	1528	3180	823757.392	807705.066	180	55	2	2 UA	2	None	Travelling	During Dredging
			3220	823754.943	807665.141								
20	22/10/2008	1625	3180	823757.393	807705.067	200	45	3	3UA	2	Hang	Feeding	Dredging Stopped
			3220	823754.944	807665.142								
21	7/11/2008	1210	3690	82376.168	807196.022	700	345	5	3UA, 2SA	2	Hang	Travelling, Feeding	Dredging Stopped
			3760	823721.882	807126.153								
22	7/11/2008	1618	1040	824724.176	809545.335	200	45	1	1UA	1	None	Travelling	During Dredging
			1015	824739.039	809565.468								
23	10/11/2008	1249	930	824789.572	809633.785	20	275	1	1UA	3	None	Travelling	Dredging Stopped
			905	824804.435	809653.888								
24	11/11/2008	1605	840	824843.078	809706.153	30	97	1	1UA	3	None	Travelling	During Dredging
			820	824854.968	809722.235								
25	16/11/2008	0843	2080	824105.888	808709.082	290	270	1	1UA	2	None	Travelling	During Dredging
26a*	21/11/2008	1430	4074	823904.923	806909.628	50	70	5	2UA, 2SS, 1UJ	2	None	Travelling, Breaching, Porpoising, Feeding	During Dredging
			4059	823904.280	806922.380								
26b*	21/11/2008	1430	4074	823904.923	806909.628	300	335	6	2UA, 2SA, 1SJ, 1UC	2	None	Travelling, Breaching, Feeding	During Dredging
			4059	823904.280	806922.380								
* = Sighting no 26a & 26b the 2 groups very soon joined together to form one large group, thus a total of 11 dolphins													
27	22/11/2008	1558	545	825018.457	809946.360	100	325	1	1UA	3	None	Travelling	During Dredging
			490	825051.155	809987.585								
28	24/11/2008	1220	3770	823721.270	807116.172	400	345	1	1UA	4	None	Travelling	Dredging Stopped
			4030	823879.867	806939.816								
29	24/11/2008	1233	3770	823721.270	807116.172	250	305	3	2UA, 1SS	4	None	ong the side of dredging machine and the nearest	Dredging Stopped

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