

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

Twelfth Quarterly Environmental Monitoring and Audit Report – October 2009 to December 2009

26 January 2010

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## Permanent Aviation Fuel Facility for Hong Kong International Airport

### Environmental Certification Sheet EP-262/2007/B

#### Reference Document/Plan

Document/ <del>Plan to be Certified</del> / Verified:	Twelfth Quarterly EM&A Report - Oct 2009 to Dec 2009
Date of Report:	26 January 2010
Date received by ET:	26 January 2010
Date received by IEC:	26 January 2010

#### Reference EM&A Manual Recommendation

EM&A Manual Recommendation:	Sections 13.5 and 13.5.3
Content:	<i>EM&amp;A Reports</i>
13.5 A maximum of 4 copies of each EM&A Report shall be submitted	
13.5.3 The ET Leader will submit Quarterly EM&A Summary Reports for the construction phase EM&A works only.	

#### ET Certification

I hereby certify that the above referenced document/ <del>plan</del> complies with the above referenced sections of the EM&A Manual recommendation	
	
Craig A Reid, Environmental Team Leader:	Date: 26 January 2010

#### IEC Verification

I hereby verify that the above referenced document/ <del>plan</del> complies with the above referenced sections of the EM&A Manual recommendation	
	
Roger Leung, Independent Environmental Checker:	Date: 28 JAN 2010


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)  
Twelfth Quarterly Environmental Monitoring and Audit Report  
October 2009 to December 2009**

26 January 2010

Prepared by: Francesca Zino/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:	26 January 2010

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## ***EXECUTIVE SUMMARY***

The construction works for the Permanent Aviation Fuel Facility resumed on 9 July 2007. This **twelfth** quarterly Environmental Monitoring and Audit (EM&A) report presents the EM&A work carried out during the period from **1 October to 31 December 2009** in accordance with the *EM&A Manual*.

### *Breaches of all Action and Limit Levels*

Water quality monitoring during dredging activities (13 November to 11 December 2009) recorded no exceedance of Action or Limit Levels for Bottom Dissolved Oxygen (DO). There were no exceedances of Limit levels for Depth-averaged Turbidity during the reporting period but on 18 November and 3 December, there were exceedances of Action Levels at four stations for Depth-averaged Turbidity. Exceedances of Depth-averaged DO were recorded on 13, 14, 15, 17, 21 and 23 November. Exceedances of Depth-averaged Suspended Solids were recorded on 15, 17, 18 and 19 November, and 3 and 5 December.

Following a review of data in accordance with the procedures specified in the *EM&A Manual*, all these exceedances were considered to be due to natural fluctuation rather than the Project Works.

### *Complaint Log*

No environmental complaints were received during the reporting period.

### *Notifications of any Summons and Successful Prosecutions*

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

### *Reporting Changes*

There were no reporting changes in the reporting period.

### *Future Key Issues*

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

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 28 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.

The decision by EPD to grant the above Environmental Permit was, however, 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 dredging works to continue until 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* 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**

This is the **twelfth** quarterly EM&A Report which summarizes the monitoring results and audit findings for the EM&A programme during the reporting period from **1 October** to **31 December 2009**.

1.2 **KEY CONTACT INFORMATION**

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

**Table 1.1** *Contact Information*

<b>Name</b>	<b>Position</b>	<b>Telephone</b>	<b>Facsimile</b>	<b>E-mail</b>
<b>Airport Authority Hong Kong – Environmental Permit Holder</b>				
Anthony Wong	Assistant General Manager Aviation Logistics	2183 3099	2824 2786	anthony.wong@hkairport.com
<b>Contractor – Leighton (Asia) Construction Limited</b>				
Brian Gillon	Project Director	2823 1111	2529 8784	brian.gillon@leightonasia.com
Boyd Merrett	Project Manager	2404 8900	2404 0081	boyd.merrett@leightonasia.com
<b>Franchisee’s Site Representative – ECO Aviation Fuel Development Limited</b>				
Philip Siu	Franchisee’s Site Representative	2963 2820	2563 6311	philip.siu@towngas.com
<b>Environmental Team – ERM-Hong Kong Limited</b>				
Craig Reid	Environmental Team Leader	2271 3000	2723 5660	craig.reid@erm.com
<b>Independent Environmental Checker – Hyder Consulting Limited</b>				
Roger Leung	Independent Environmental Checker	2911 2233	2805 5028	roger.leung@hyderconsulting.com



## 2 ENVIRONMENTAL STATUS

### 2.1 PROJECT AREA

The project area is in Area 38 of Tuen Mun and the pipelines are located at 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*. Initial marine dredging operations were completed on 23 January 2009. Due to pipeline repairs, dredging works were resumed on 13 November 2009 and completed on 11 December 2009. *Table 2.2* presents the cumulative quantity of excavated materials during marine dredging operations. Daily and cumulative dredging production rates between September 2008 and December 2009 are illustrated in *Figure 2.1*.

*Table 2.1 Summary of Works Undertaken During the Reporting Period*

Area	Works undertaken
Tuen Mun Area 38	<ul style="list-style-type: none"><li>• Tank Farm, Roof Truss and Bund Wall Construction</li><li>• Permanent Drainage Construction</li><li>• Operational &amp; Fire Services Buildings Construction</li><li>• Jetty Works (Non-piling)</li><li>• Pre-Commission and Commissioning Activities for Phase 1a (the first four tanks)</li></ul>
Submarine Pipeline Route	<ul style="list-style-type: none"><li>• Riser connections at seawall and Sha Chau</li><li>• Backfilling and placing of rock armour over the pipelines</li><li>• Dredging operations</li></ul>

*Table 2.2 Cumulative Quantity of Excavated Materials*

Type of Excavated Materials	Period Bulk Volume (m <sup>3</sup> )	Cumulative Bulk Volume (m <sup>3</sup> )
<i>From 17 December 2007 to 31 March 2008</i>		
Contaminated Mud	71,564	71,564
Uncontaminated Mud	123,953	123,953
<i>From 1 September 2008 to 23 January 2009</i>		
Contaminated Mud	0	71,564

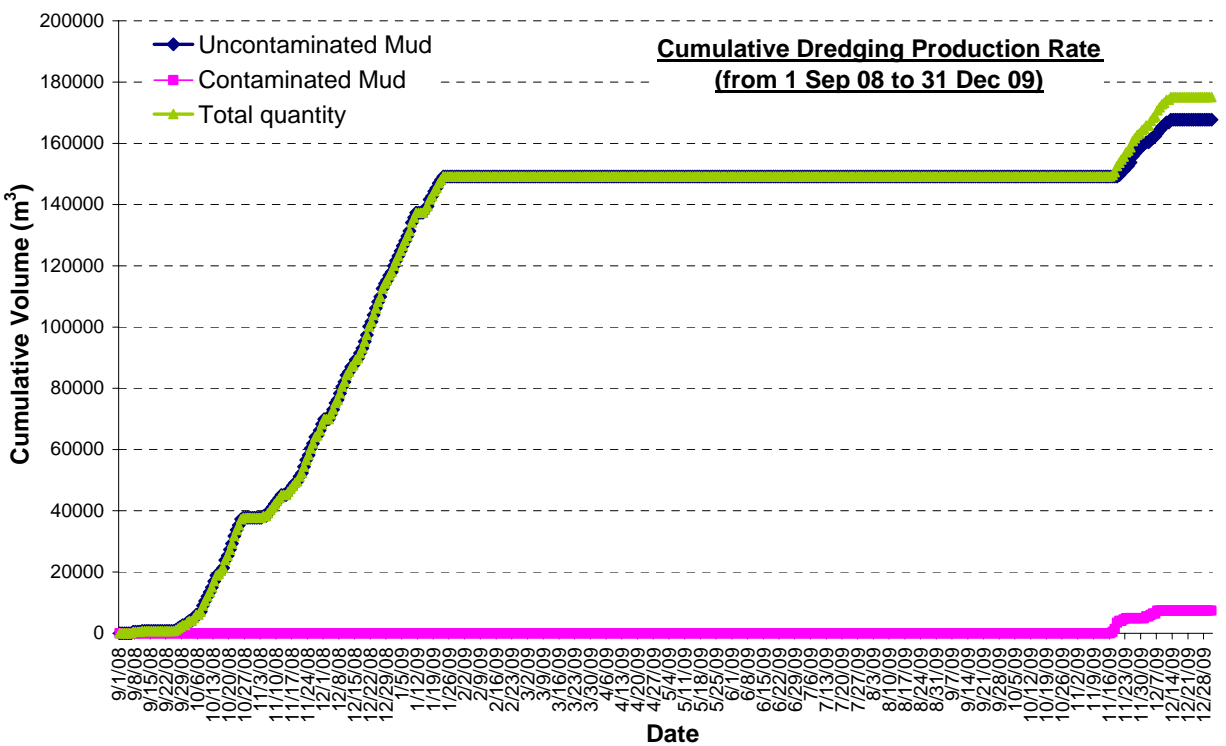
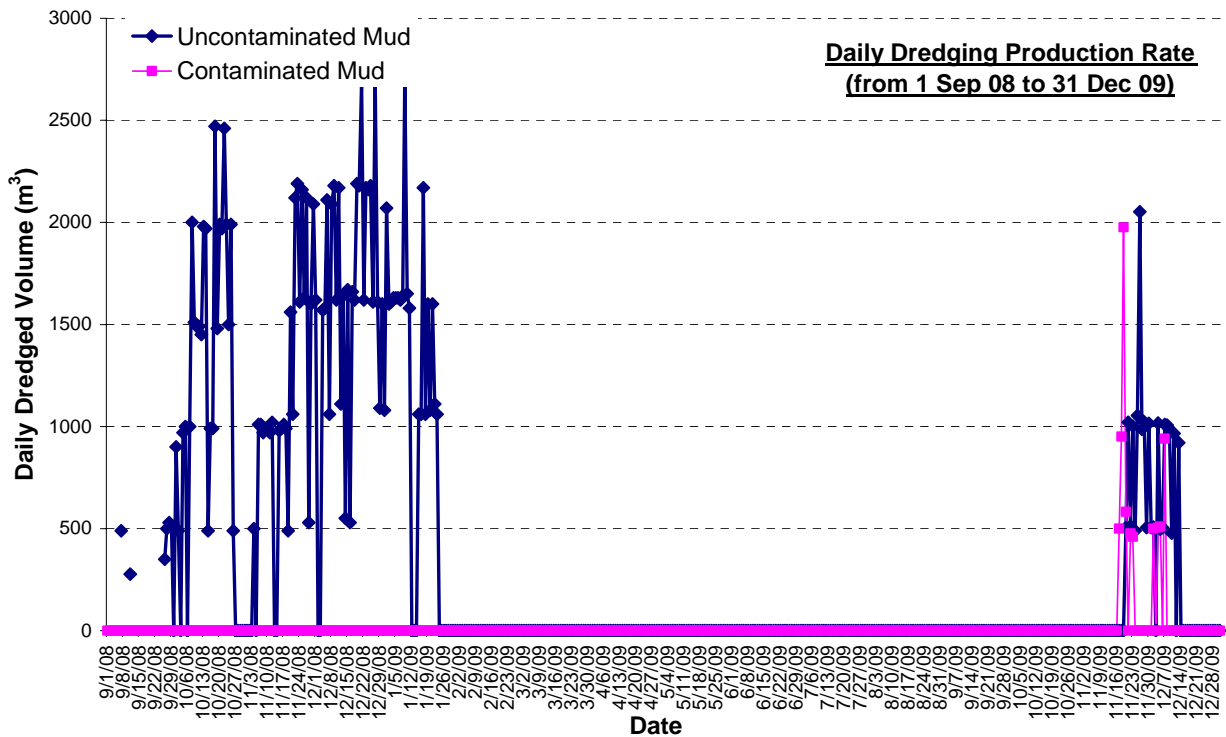


Figure 2.1 Daily and cumulative volumes (m<sup>3</sup>) of excavated materials (both contaminated and uncontaminated mud) from 1 September 2008 to 31 December 2009.



Type of Excavated Materials	Period Bulk Volume (m <sup>3</sup> )	Cumulative Bulk Volume (m <sup>3</sup> )
Uncontaminated Mud	149,147	273,100
<i>From 13 November 2009 to 11 December 2009</i>		
Contaminated Mud	7,399	78,963
Uncontaminated Mud	18,561	291,661

#### 2.4 MONITORING SCHEDULE OF THE REPORTING PERIOD

Daily water quality monitoring was carried out during dredging activities during the reporting period from 13 November 2009 to 11 December 2009. The water quality monitoring schedule for November and December 2009 is presented in *Annex C*.

#### 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 2.3*.

*Table 2.3 Summary of Environmental Licensing, Notification and Permit Status*

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/UI1D/5542/DC/DH/PL</i>	Throughout Project	Notification on 6 July 2007

<b>Permit/ Licenses/ Notification</b>	<b>Reference</b>	<b>Validity Period</b>	<b>Remarks</b>
Construction Noise Permit	GW-RW0676-07	21 December 2007 to 19 June 2008	For land-based works including air compressors, breakers, excavators, wheeled loaders, mobile cranes, concrete lorry mixers, hand-held pokers, bar benders/cutters, wood saws, grinders, submarine water pump, lorries with crane, dump trucks, rollers, ventilation fans and generators
	GW-RW0677-07	21 December 2007 to 29 February 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan
	GW-RW0678-07	21 December 2007 to 18 June 2008	For marine jetty works including concrete pump derrick barges, hand-held grinders, generators, air compressors, boring machines, water pumps, tug boat, grout mixers and grout pumps
	GW-RW0094-08	1 March to 31 March 2008	For marine dredging operation including grab dredger, tug boat, split hopper barge and motor sampan
	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

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
	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
	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
	GW-RW0261-09	3 July 2009 to 3 November 2009	For land-based and marine works including derrick barge, grinder, crane, tug boat, drill, welding machine, hopper barge, motor sampan, air compressor
	GW-RW0299-09	21 July 2009 to 20 January 2010	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 etc

Permit/ Licenses/ Notification	Reference	Validity Period	Remarks
	GW-RW0459-09	26 October 2009 to 28 February 2010	For marine dredging operation including air compressors, derrick barge, tug boat, mobile crane, hand-held grinder, generator, hand-held drill, winch, welding machine, motor sampan, grab dredger hopper barge etc
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
	EP/MD/10-041	11 November 2009 to 31 December 2009	For Type 1 – Open Sea Disposal
	EP/MD/10-042	11 November 2009 to 10 December 2009	For Type 1 – Open Sea Disposal (Dedicated Site) & Type 2 – Confined Marine 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) was established within three months after commencement of construction of the Project. The major duty of the 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. Whereas previously the CLG would meet quarterly,

following their last meeting on 13 September 2009, it was agreed to meet every six months. Therefore, during the reporting period, no meetings were organised by the CLG. Details of the CLG (including Membership and its Terms of Reference) and the meeting minutes can be found on the Project website (<http://www.paffhk.com>).

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

Water quality monitoring during dredging activities (13 November to 11 December 2009) recorded no exceedance of Action or Limit Levels for Bottom Dissolved Oxygen (DO). There were no exceedances of Limit levels for Depth-averaged Turbidity during the reporting period but on 18 November and 3 December, there were exceedances of Action Levels at four stations for Depth-averaged Turbidity. Exceedances of Depth-averaged DO were recorded on 13, 14, 15, 17, 21 and 23 November. Exceedances of Depth-averaged Suspended Solids were recorded on 15, 17, 18 and 19 November, and 3 and 5 December.

A summary of the exceedances occurring during the reporting period is shown in *Table 2.4* and a description of the actions taken following these non-compliances is detailed in *Section 3.2*.

**Table 2.4** *Summary of Exceedances of Action and Limit Levels Recorded during the Reporting Period*

Date	Parameter	Monitoring Stations	
		Mid-Ebb Tide	Mid-Flood Tide
13 Nov 2009	DO (Depth-averaged)		IMO1*, IMO3*, IMO4*
	SS (Depth-averaged)		IMO4*
14 Nov 2009	DO (Depth-averaged)	IMO1, MPB1, MPB2	IMO1, IMO2, IMO3, IMO4, MPB1*, MPB2*, MP*
15 Nov 2009	DO (Depth-averaged)	MPB1, MPB2, MP	IMO1*, IMO2, IMO3, IMO4, MPB2
	SS (Depth-averaged)	MP	IMO2*, IMO3, IMO4*
17 Nov 2009	DO (Depth-averaged)	MPB1	IMO1*, IMO2*, MP
	SS (Depth-averaged)	MPB1*, MPB2, MP*	IMO1*, MPB1*, MPB2*, MP*
18 Nov 2009	Turbidity (Depth-averaged)	IMO5*, MPB2*	IMO5*, MPB2*
	SS (Depth-averaged)	MPB1*, MPB2	MPB1*
19 Nov 2009	SS (Depth-averaged)	MPB2*	IMO1*, IMO6*, MPB2*
21 Nov 2009	DO (Depth-averaged)	IMO5*, IMO6*	IMO6
	SS (Depth-averaged)	MPB1*	
23 Nov 2009	DO (Depth-averaged)		IMO5*
3 Dec 2009	Turbidity (Depth-averaged)		IMO5*, MPB1*, MPB2*, MP*
	SS (Depth-averaged)	MPB1	IMO5, IMO6*, MPB1, MPB2, MP
5 Dec 2009	SS (Depth-averaged)		IMO5, IMO6

\*Note: Action Level but not Limit Level exceedance

2.8 *SUMMARY OF ENVIRONMENTAL COMPLAINTS*

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

2.9 *SUMMARY OF ENVIRONMENTAL SUMMONS*

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



### 3.1 PREVIOUS ENVIRONMENTAL DEFICIENCIES AND FOLLOW-UP ACTIONS

As no environmental complaints were received over the last reporting period, no follow-up action was required.

Weekly site inspections were carried out by the ET on 7, 14, 21 and 28 October, 6, 12, 19 and 26 November, and 2, 10, 18, 23 and 30 December 2009. Overall, the site was in good orderly manner and no non-compliances were found. Environmental deficiencies and follow-up actions/ mitigation measures were identified during the inspections and summarised in *Table 3.1*.

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

Reporting Month	Observation	Follow-up Action
October 2009	Much of the Tank Farm area was unpaved.	The Contractor was reminded to regularly water the unpaved areas to avoid dust generation.
	Black smoke was seen being emitted from a barge sitting offshore of the Jetty area.	The Contractor was advised to inspect or service the engine as soon as possible.
	The exposed slope surfaces at excavation site near the main entrance were not sufficiently covered.	The Contractor was reminded to cover exposed surfaces by tarpaulin or planting vegetation to avoid dust generation.
	Water was found leaking from Tank 11.	The Contractor was reminded to ensure the water drained adequately and was not left to accumulate in stagnant pools.
	A stagnant pool of water was observed underneath the dehumidifier leading into Tank 8, and the hose leading from the dripping pipe was not leading to a drain.	The Contractor was advised to fill in the stagnant water pool and to ensure the hose from the pipe led to a drain.
	Mosquito larvae were observed in the sediment tanks near the middle entrance (to Phase 1a).	The Contractor was advised to cover the sediment tanks as soon as possible.
	The sea water near the Jetty area was turbid, which might have been due to sediment disturbance from the propeller of the barge operating in the shallow area.	Since the operation was temporary and the disturbance was localised, no remedial action was advised.

Reporting Month	Observation	Follow-up Action
	Water was observed in the bunding around the diesel tank and the generator respectively, in the workshop area.	The Contractor was advised to clear the water immediately.
	Cleaning of Tank 11 caused water to collect at its base.	The Contractor was advised to clear or backfill the water as soon as the cleaning was completed.
	The paper recycling bin near the main office area was starting to overflow.	The Contractor was advised to empty the bin and put the spare, new recycling bins out around the site.
	The labels on the drums in the chemical waste storage area were observed to be damaged or absent.	The Contractor was advised to renew the labels.
	Painting material without proper receptacles was found near the sediment tank near the middle entrance (to Phase 1a).	The Contractor was advised to clear this into the chemical waste storage area as soon as possible.
	Scattered pieces of debris were found around the Tank Farm and Jetty areas.	The Contractor was advised to collect all debris and dispose of it appropriately.
	Black plastic bags and hosepipes were found deposited in the chemical waster storage area by Tank 10.	The Contractor was advised to clear these to the appropriate place as soon as possible.
	No fire extinguisher was found next to the generator by Tank 10.	The Contractor was reminded to put a fire extinguisher next to the generator as soon as possible.
November 2009	The air compressor near the Jetty area was found without a label or drip tray. The air compressor was evidently not yet in operation.	The Contractor was advised to ensure the air compressor had the correct label and a drip tray before starting operation.
	The CNP permit showing at the main site entrance showed an expiry date of 3 November 2009.	The Contractor was advised to put up the new permit that had been obtained.
	The sediment tanks near the middle entrance (to Phase 1a) were left uncovered and a possible breeding ground for mosquitoes.	The Contractor was advised to cover the sediment tanks as soon as possible.
	A pipe connection on the path leading from the main to the middle entrance was found to be leaking.	The Contractor was asked to fix the connection as soon as possible.

Reporting Month	Observation	Follow-up Action
	Water was observed in the bunding around the generator in the Workshop area and in the drip tray of the diesel drum near the Workshop area.	The Contractor was advised to clear this water immediately.
	A thin oil film was observed on the seawater by the jetty. Water coming out of the drainage system appeared clean and it was concluded that the oil film was probably not resulting from the PAFF site.	No action necessary.
	Dirty water was found behind the painting area by Tank 8.	The Contractor was advised to clear the water as soon as possible.
	Scattered pieces of debris were found around the Tank Farm areas, a stockpile of debris and construction waste were found just inside the middle entrance to the site, and wire debris was found behind a lorry by Tank 10. Black plastic bags and hosepipes were also found deposited in the chemical waster storage area by Tank 10.	The Contractor was advised to collect all debris and dispose of it appropriately.
	A temporary paint area had been set up by Tank 8.	The Contractor was advised to check the set-up of the paint area near Tank 8 to ensure it was safe and there was no contamination of the surrounding area. They were also advised to ensure that all empty paint cans were stored in the chemical waste facility.
	The dredging barge was inspected and there were insufficient waste receptacles.	The Contractor was advised to ensure that rubbish bins were provided on all levels of the barge, and that they were of adequate capacity.
	Oil was identified in the drip tray around the generator aboard the grab dredger and there was an open plastic bucket of oil near the generator.	The Contractor was advised to clear the drip tray immediately and cover the plastic bucket.
	The electric hazard label on the generator aboard the grab dredger was illegible.	The Contractor was advised to arrange for a new sign to be put in place.

Reporting Month	Observation	Follow-up Action
December 2009	A sediment plume was observed in the run-off drainage near the Jetty area.	The Contractor was advised to settle the run-off via a sediment tank before being discharged.
	Water was observed in the drip tray of the diesel drum outside the workshop area and in the air compressor by Tank 11.	The Contractor was advised to clear all this water as soon as practicable.
	The bunding round the generator in the workshop area was found to have a pipe leaking water from inside to outside.	The Contractor was advised to bung the pipe as soon as possible.
	The drainage system was not in operation as the sediment tanks had been removed due to the construction works.	The Contractor was advised to reinstate the sediment tanks and restore the drainage system as soon as possible as there had been some rain recently and there was some surplus water onsite.
	General refuse had accumulated without receptacles in the tank farm area and debris in black plastic bags was found near the Jetty Area.	The Contractor was advised to remove and store all refuse in proper containers and to place black plastic bags of debris in a skip or remove them as soon as possible.
	Empty paint cans were found in the chemical waste storage area. Drums with no labels and no drip trays were also found near the office block.	The Contractor was advised to place the empty paint cans in black plastic bags and label them appropriately and to label the drums and place them in drip trays.
	The painting subcontractor's chemical waste disposal trip tickets for disposal of their empty paint cans were not available for inspection.	The Contractor was advised to follow this up with the subcontractor as soon as possible to make them available.
	The chemical waste storage by Tank 8 and by the offices was found to be full, some waste was observed outside the storage facility and a dead rat was also found under the black plastic bags.	The Contractor was advised to clear the waste to a designated chemical waste area as soon as possible, and then get the waste cleared by a licensed collector immediately.
	Some oil stains were found on the floor inside the bunded area of the machinery on the grab dredger.	The Contractor was advised to clear the oil as soon as possible.
	Two oil drums were found on the grab dredger without drip trays.	The Contractor was advised to put the drums inside a trip tray as soon as possible.

Reporting Month	Observation	Follow-up Action
	Waste receptacles on the grab dredger were found to be of inadequate capacity.	The Contractor was advised to provide larger waste receptacles as soon as possible.
	A leaking diesel pump was found on the grab dredger, with a plastic bucket below it to catch the drips.	The Contractor was advised to get the pump fixed as soon as possible.
	A small amount of soil was observed outside the vehicle entrance on the site access road.	The Contractor was advised to clean it as soon as possible and to implement wheel-wash procedures properly.
	A water pipe connection and another hosepipe behind Tank 11 were found to be leaking and producing stagnant pools of water.	The Contractor was asked to fix the leaking water and clear/fill the stagnant water as soon as possible.

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**

Water quality monitoring during dredging activities (13 November to 11 December 2009) recorded no exceedance of Action or Limit Levels for Bottom Dissolved Oxygen (DO). There were no exceedances of Limit levels for Depth-averaged Turbidity during the reporting period but on 18 November and 3 December, there were exceedances of Action Levels at four stations for Depth-averaged Turbidity. Exceedances of Depth-averaged DO were recorded on 13, 14, 15, 17, 21 and 23 November. Exceedances of Depth-averaged Suspended Solids were recorded on 15, 17, 18 and 19 November and 3 and 5 December.

A summary of the exceedances recorded during the reporting period is shown in *Table 2.4 of Section 2.7* and graphical representations of the results are presented in *Annex F*. Descriptions of the actions taken following identification of non-compliance are discussed below.

Although dredging operations were undertaken during the reporting period, on examination of the results, it was concluded that all the exceedances described above were unlikely to be caused by the Project for the following reasons:

- Not all parameters showed the same trend of exceedance results at the same stations at the same tide (eg on 3 December there were exceedances of Depth-averaged Turbidity and Suspended Solids at various stations, but there were no exceedances of Bottom or Depth-averaged DO at any station throughout the day).

- Exceedances were found at monitoring stations upstream and downstream of dredging vessels that were not in operation (e.g. exceedance of Action Level of depth-averaged DO on 13 November 2009 at IMO3 and IMO4). The values were comparable to exceedances found at stations upstream and downstream of operational dredging vessels on the same day (eg exceedance of Action Level of depth-averaged DO on 13 November 2009 at IMO1).
- There have been incidents in the past in this area where exceedances have occurred despite the dredger not being in operation (eg 10 Feb 2008, exceedance in SS despite no dredging work; 17 and 22 Dec 2007, 4 and 5 Jan 2008, 6 and 10 Feb 2008, exceedances in Turbidity despite no dredging work).

Although the measured levels of Suspended Solids were particularly high at MPB1 on 3 December 2009, MPB1 station was located far away from the dredging operation at the time. As mentioned previously, there have also been incidents in the past in this area where exceedances have occurred despite the dredger not being in operation, it was concluded that the exceedances were unlikely to be due to the project works.

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.

### 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 E*.

## 4 ENVIRONMENTAL MONITORING

### 4.1 AIR AND NOISE

Air and Noise monitoring is not required for the project.

### 4.2 WATER QUALITY

In accordance to the *EM&A Manual*, water quality monitoring was carried out during dredging activities, which commenced on 13 November 2009 and were completed on 11 December 2009. QA/QC reports for Suspended Solids testing and monitoring results have been presented in 37<sup>th</sup> and 38<sup>th</sup> *Monthly EM&A Reports*. Graphical presentations of the monitored parameter during the reporting period are included in *Annex F*.

Results of the monitoring demonstrated that all measured Bottom Dissolved Oxygen (DO) levels were compliant with the Action and Limit Levels specified in the *EM&A Manual*. Concentrations of Depth-averaged Turbidity were also all compliant with Limit levels but exceeded Action Levels on two days, 18 November and 3 December, at four stations. Exceedances of Depth-averaged DO were recorded on 13, 14, 15, 17, 21 and 23 November. Exceedances of Depth-averaged Suspended Solids were recorded on 15, 17, 18 and 19 November and 3 and 5 December. A review of the above exceedances concluded that they were not attributable to the Project works and were likely due to natural variation (see *Section 3.2* for further details).

### 4.3 POPs MONITORING

Biweekly monitoring of water samples was conducted for Persistent Organic Pollutants (POPs) analysis and during the reporting period on 25 November and 8 December. Total PCBs, PAHs and DDTs were all below detection limits. Monitoring results and QA/QC reports for POPs testing have been presented in 37<sup>th</sup> and 38<sup>th</sup> *Monthly EM&A Reports*.

### 4.4 WASTE MANAGEMENT

According to EP *Condition 3.3*, the Contractor's revised Waste Management Plan (Revision 5) (WMP), which has been certified by the ET and IEC, was submitted to the EPD on 5 November 2008.

### 4.5 CULTURAL HERITAGE

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

#### 4.6 *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 habilitated by vegetation which has grown during the project suspension period.

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

#### 4.7 *LAND CONTAMINATION, HAZARD TO LIFE AND FUEL SPILL RISK*

The ET and IEC verified updated design audit plan which was submitted to the EPD on 7 November 2007.

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

#### 4.8 *ECOLOGY*

##### *Dolphin Visual Monitoring*

In accordance to *EM&A Manual*, dolphin monitoring was undertaken during dredging activities from 13 November 2009 to 11 December 2009.

During the reporting period, a total of eight dolphin sightings were recorded. Four sightings were recorded outside the exclusion zone while four sightings were recorded within the zone. Five sightings occurred during dredging, but only one occurred of these occurred within the exclusion zone. No action was considered necessary should dolphins are sighted within the zone during dredging according to the *EM&A Manual*. The sighting locations and field records are presented in *Annex G*.

#### 4.9 *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 monitoring of Persistent Organic Pollutants (POPs) during construction of the Project. The revised *EM&A Manual*, which has been verified by the IEC, was submitted to the EPD on 1 April 2009.

#### 4.10 *BASELINE WATER QUALITY MONITORING*

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



## 5 *FUTURE KEY ISSUES AND CONCLUSION*

### 5.1 *KEY ISSUES FOR THE NEXT REPORTING PERIOD*

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

- dust release and suppression; and
- backfilling of rock armour over pipelines.

### 5.2 *IMPACT PREDICTION FOR THE NEXT REPORTING PERIOD*

Provided that environmental mitigation measures including good on-site practises are properly implemented, no unacceptable adverse environmental impacts are expected.

### 5.3 *WORKS AND MONITORING SCHEDULE FOR THE NEXT REPORTING PERIOD*

Work programme for the next reporting period includes:

- backfilling and placing of rock armour works;
- riser connections at Sha Chau;
- jetty platform works (non-piling);
- site works (construction works for tank farm drainages, bund wall, security wall, emergency vehicle access road etc); and,
- commissioning activities for Phase 1a (the first four tanks).

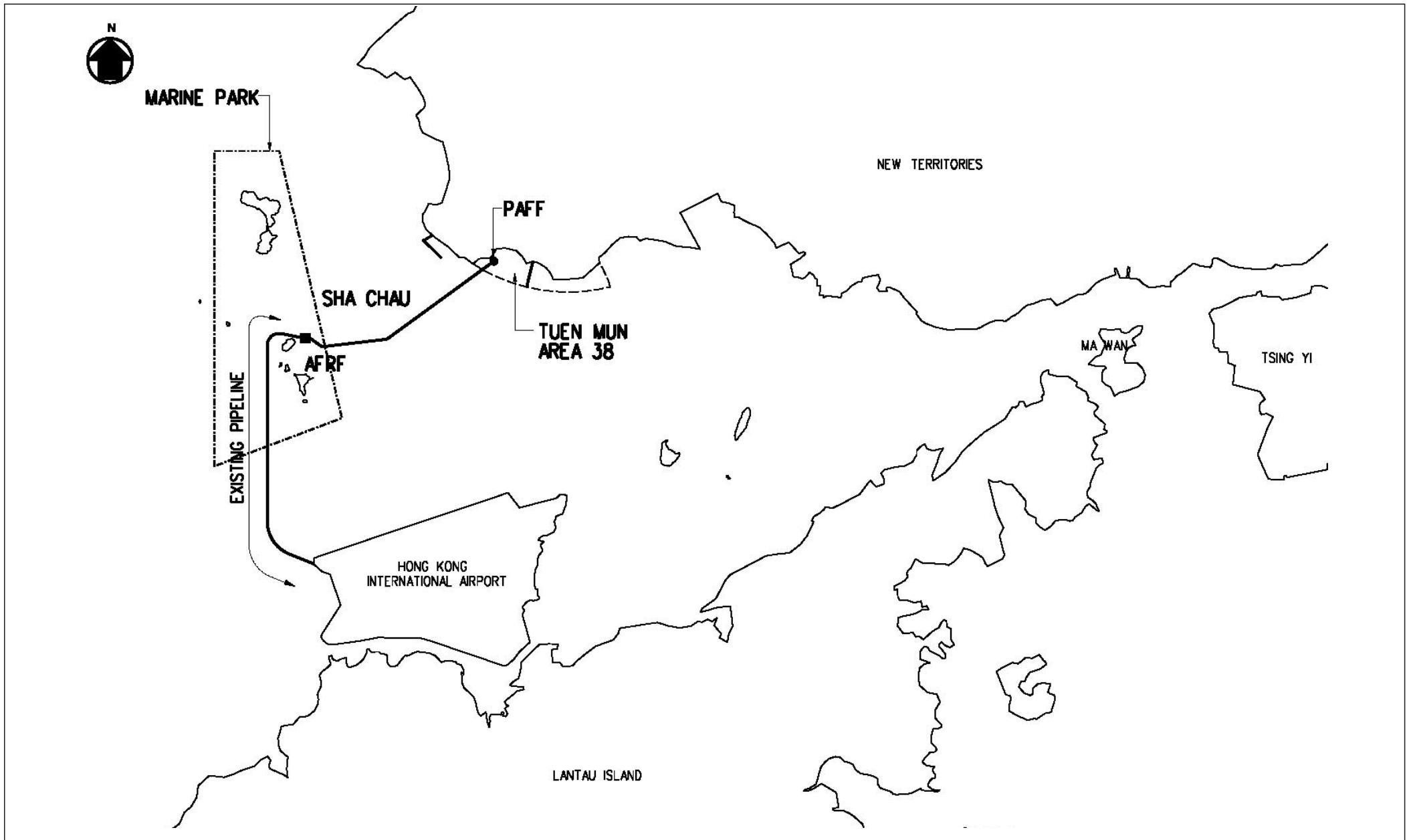
Weekly site inspections will be undertaken in accordance with the *EM&A Manual*.

### 5.4 *CONCLUSION*

The EM&A works were conducted throughout the construction 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 in an orderly manner.

Annex A

## Project Location



Annex A

Location of PAFF

FILE: 0018105bb1  
DATE: 12/11/2007






Environmental  
Resources  
Management



Annex B

## 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)

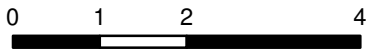
MPB1

MPB2

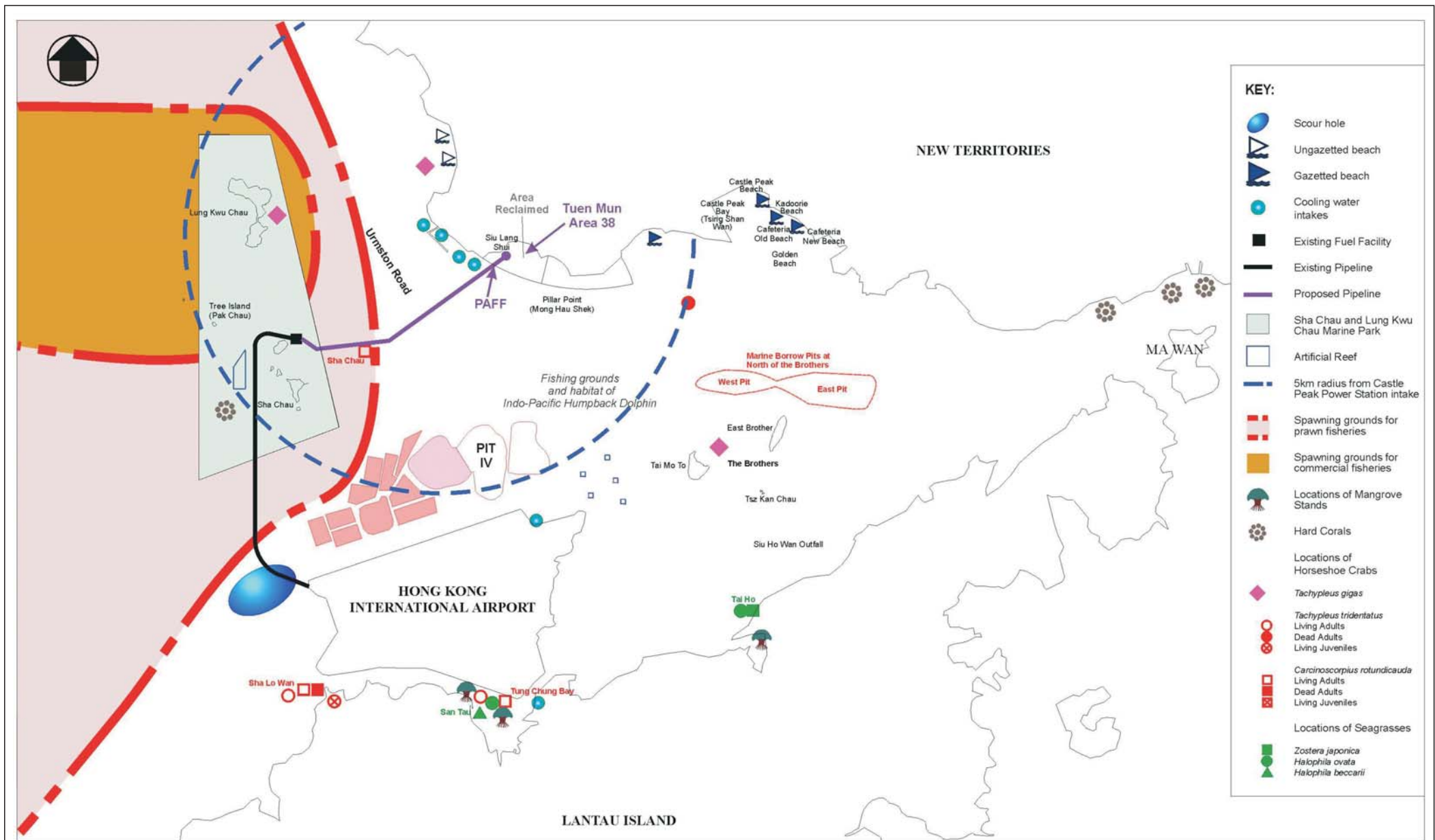
C3 (NM6)



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

## Water Quality Monitoring Schedule for the Reporting Period

### Impact Water Quality Monitoring Schedule for November 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov
8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov
					Mid-Ebb 10:08 Mid-Flood 16:24	Mid-Ebb 11:00 Mid-Flood 16:54
15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov
Mid-Ebb 11:49 Mid-Flood 17:24	Mid-Flood 7:03 Mid-Ebb 12:34	Mid-Flood 7:52 Mid-Ebb 13:14	Mid-Flood 8:38 Mid-Ebb 13:52	Mid-Flood 9:21 Mid-Ebb 14:28	Mid-Flood 10:04 Mid-Ebb 15:02	Mid-Flood 10:48 Mid-Ebb 15:33
22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov
Mid-Flood 11:36 Mid-Ebb 15:57	Mid-Ebb 4:28 Mid-Flood 16:48	Mid-Ebb 5:09 Mid-Flood 17:33	Mid-Ebb 5:55 Mid-Flood 14:19 <b>(POP SAMPLING)</b>	Mid-Ebb 6:55 Mid-Flood 14:48	Mid-Ebb 8:10 Mid-Flood 15:16	Mid-Ebb 9:16 Mid-Flood 15:42
29-Nov	30-Nov					
Mid-Ebb 10:16 Mid-Flood 16:11	Mid-Ebb 11:07 Mid-Flood 16:42					





Annex D

## Cumulative Complaints Statistics

## CUMULATIVE STATISTICS OF COMPLAINTS

*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 9<sup>th</sup> 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
01/07/08 – 31/07/08	0	2	Nil
01/08/08 – 31/08/08	0	2	Nil
01/09/08 – 30/09/08	0	2	Nil
01/10/08 – 31/10/08	0	2	Nil
01/11/08 – 30/11/08	0	2	Nil
01/12/08 – 31/12/08	0	2	Nil
01/01/09 – 31/01/09	0	2	Nil
01/02/09 – 28/02/09	0	2	Nil
01/03/09 – 31/03/09	0	2	Nil
01/04/09 – 30/04/09	0	2	Nil
01/05/09 – 31/05/09	0	2	Nil
01/06/09 – 30/06/09	0	2	Nil
01/07/09 – 31/07/09	0	2	Nil
01/08/09 – 31/08/09	0	2	Nil
01/09/09 – 30/09/09	0	2	Nil
01/10/09 – 31/10/09	0	2	Nil
01/11/09 – 30/11/09	0	2	Nil
01/12/09 – 31/12/09	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 9<sup>th</sup> 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
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
01/07/08 – 31/07/08	0	0	Nil
01/08/08 – 31/08/08	0	0	Nil
01/09/08 – 30/09/08	0	0	Nil
01/10/08 – 31/10/08	0	0	Nil
01/11/08 – 30/11/08	0	0	Nil
01/12/08 – 31/12/08	0	0	Nil
01/01/09 – 31/01/09	0	0	Nil
01/02/09 – 28/02/09	0	0	Nil
01/03/09 – 31/03/09	0	0	Nil
01/04/09 – 30/04/09	0	0	Nil
01/05/09 – 31/05/09	0	0	Nil
01/06/09 – 30/06/09	0	0	Nil
01/07/09 – 31/07/09	0	0	Nil
01/08/09 – 31/08/09	0	0	Nil
01/09/09 – 30/09/09	0	0	Nil
01/10/09 – 31/10/09	0	0	Nil
01/11/09 – 31/11/09	0	0	Nil
01/12/09 – 31/12/09	0	0	Nil

Annex E

Implementation  
Programme of Mitigation  
Measures

## ANNEX E 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		
<b>Water Quality</b>										
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	Complete
6.7	6.8.1	No hydraulic dredging within Marine Park.	Marine Park / Pipeline Dredging	Contractor	TMEIA		Y		N/A	Completed
6.7	6.8.1	Dredging for pipeline trench should be timed to coincide with maintenance dredging for Sha Chau AFRF marine access channel if relevant.	Sha Chau AFRF Marine access channel	Airport Authority	TMEIA		Y		N/A	Completed
6.4		The work rate for dredging should not exceed 4,000 m <sup>3</sup> /hr for the TSHD and 7,000 m <sup>3</sup> /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) onsite 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
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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	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	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	Completed
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	Ongoing
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	Completed for Phase 1a <sup>1</sup> Ongoing for Phase 1b
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	TBC

<sup>1</sup> Contractor has installed leak detecting telltale pipes underneath the tanks rather than a “system” and not installed underneath the impermeable bed around the tanks.

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	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	Ongoing <sup>1</sup>
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	Complete for Phase 1a. Ongoing for Phase 1b
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

<sup>1</sup> Non-sand/non-earth absorbent materials are kept on site as per paragraph 11 of the Code of Practice for Oil Storage Installations.

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	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	Operating Manuals completed <sup>1</sup>
<b>Ecology</b>										
7.8	5.3	Undertake post construction dolphin abundance monitoring.	Construction	Contractor	TMEIA			Y	N/A	In planning
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
<b>Landscape &amp; Visual</b>										

<sup>1</sup> Operating Manuals includes routines for monitoring the oil/water interceptors only as per Waste Water Licence. There are no bore hole test points on/off site to monitor the effectiveness of the measures, referring to the practise at the HKIA tank farm.

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	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
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

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	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"> <li>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;</li> <li>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,</li> <li>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.</li> </ul>	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		
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
<b>Fuel Spill Risk</b>										
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	Completed
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	Completed
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	Completed
11.4.1	10.2	Pipeline to be covered with a protective rock armour layer.	Pipelines/ Design Phase	Franchisee	TMEIA		Y		Franchisee	Completed
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	Completed
11.4.1	10.2	An automatic shut-off system shall be implemented for pipelines.	Pipelines/ Design Phase	Franchisee	TMEIA		Y		N/A	Completed
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	Ongoing
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	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		
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	Completed
11.4.1	10.2	Operator-training programme shall be implemented.	Jetty/ During Tanker Berth	Franchisee	TMEIA	Y		Y	N/A	Ongoing
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
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"> <li>Two inspections every year of the tank farm, jetty and pipelines including one undertaken pursuant to the Joint Inspection Group (JIG) explained above;</li> <li>Inspection of the whole sub sea pipelines every 5 to 10 years;</li> <li>Health, Safety and Environmental audit of the facility once every 3 years; and,</li> <li>Inspection of the structural integrity of the tanks once per year.</li> </ul>	Operation	Franchisee	TMEIA			Y	N/A	Pre opening JIG and Shell inspections completed.  Remainder will start on 1/4/10 with commencement of operations, except procedures of 'Inspection of the structural integrity of the tanks once per year', which needs to be defined for further process

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	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	Ongoing
<b>Land Contamination</b>										
13.5.1	10.2	Bundling 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	Completed
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	Completed
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	Ongoing
13.5.1	10.2	Impermeable lining shall be provided for all tank pits.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	Completed
13.5.1	10.2	Leak detection systems shall be provided to all valves.	Tank farm / Design	Franchisee	TMEIA	Y			N/A	Completed
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	Completed
13.5.1	10.2	Emergency spill response plans shall be prepared.	Tank farm / Design	Franchisee	TMEIA	Y		Y	N/A	Completed
13.5.1	10.2	Spill control materials and equipment shall be provided on site.	Tank farm / Design	Franchisee	TMEIA	Y		Y	N/A	Completed
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	Completed
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	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		
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	Ongoing
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	Ongoing <sup>1</sup>
13.5.5	10.2	Tank overfill 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	Completed for Phase 1a. Ongoing for Phase 1b.
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	Ongoing
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 provide additional containment and facilitate clean up of any leaks.	Tank farm / Design	Franchisee	TMEIA	Y	Y	Y	N/A	Complete for Phase 1a. Ongoing for Phase 1b
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	Ongoing
<b>Waste Management</b>										
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

<sup>1</sup> Product inventory monitoring is ongoing but tank pressure testing needs to be defined for further process.

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 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
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

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	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
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	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

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	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
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



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	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
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

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	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
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

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	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
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

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	All storage areas for chemical waste shall be: <ul style="list-style-type: none"> <li>• Clearly labelled;</li> <li>• Enclosed on at least 3 sides;</li> <li>• Have impermeable floor and bunding sufficient to fully retain any spillage or leakages;</li> <li>• Ventilated; and,</li> <li>• Covered to prevent rainfall from entering.</li> </ul>	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
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 F

Graphical Presentation of  
Impact Water Quality  
Monitoring Results for the  
Reporting Period

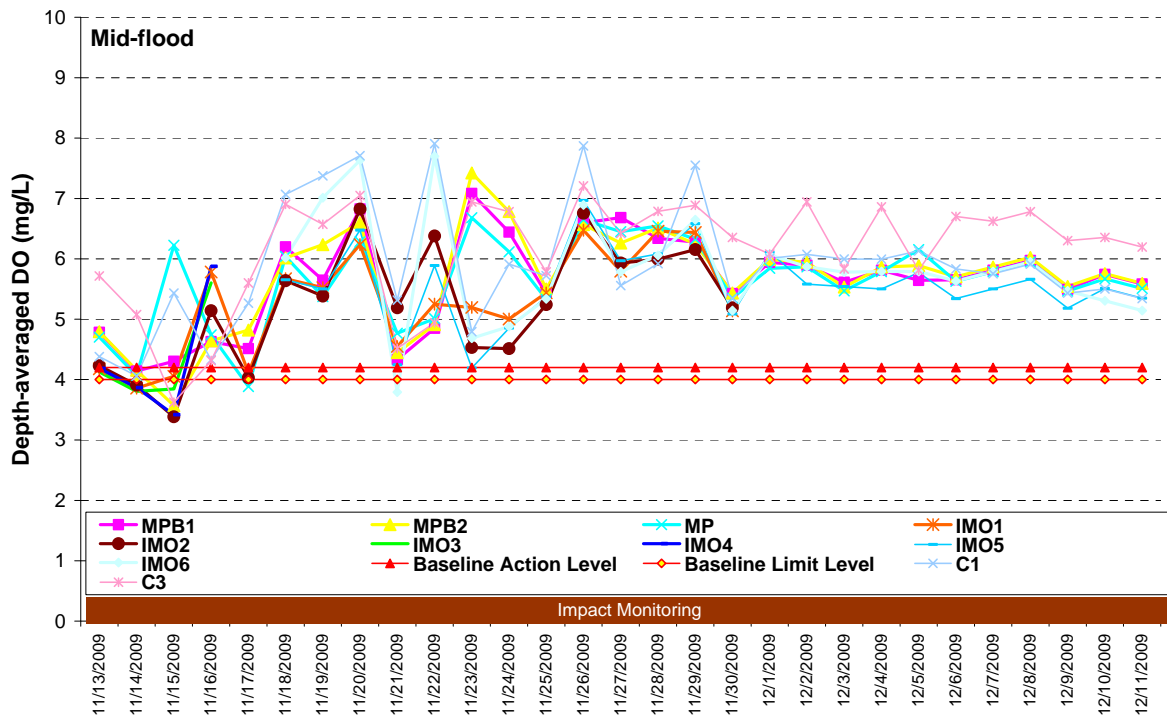
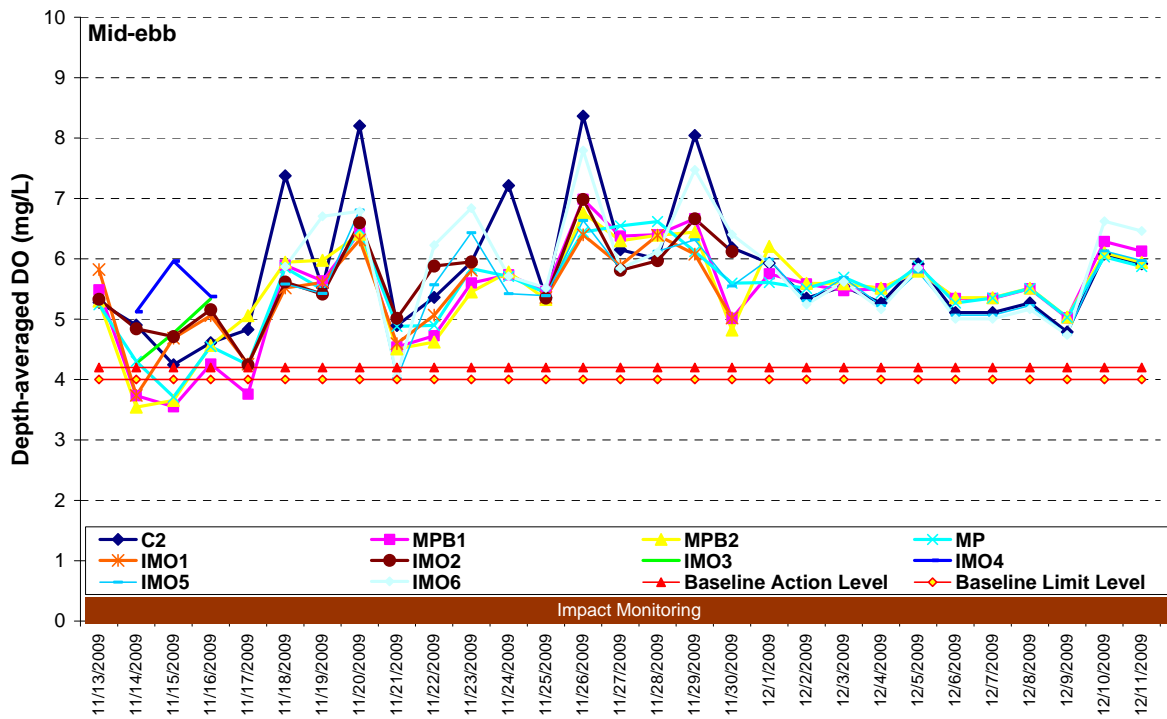


Figure F1 Dissolved oxygen concentration (depth-averaged) (mg/L) of water samples at mid-ebb and mid-flood between 13 November and 11 December 2009

Ref: 0018105\_Annex F\_water graphs (Nov - Dec).doc



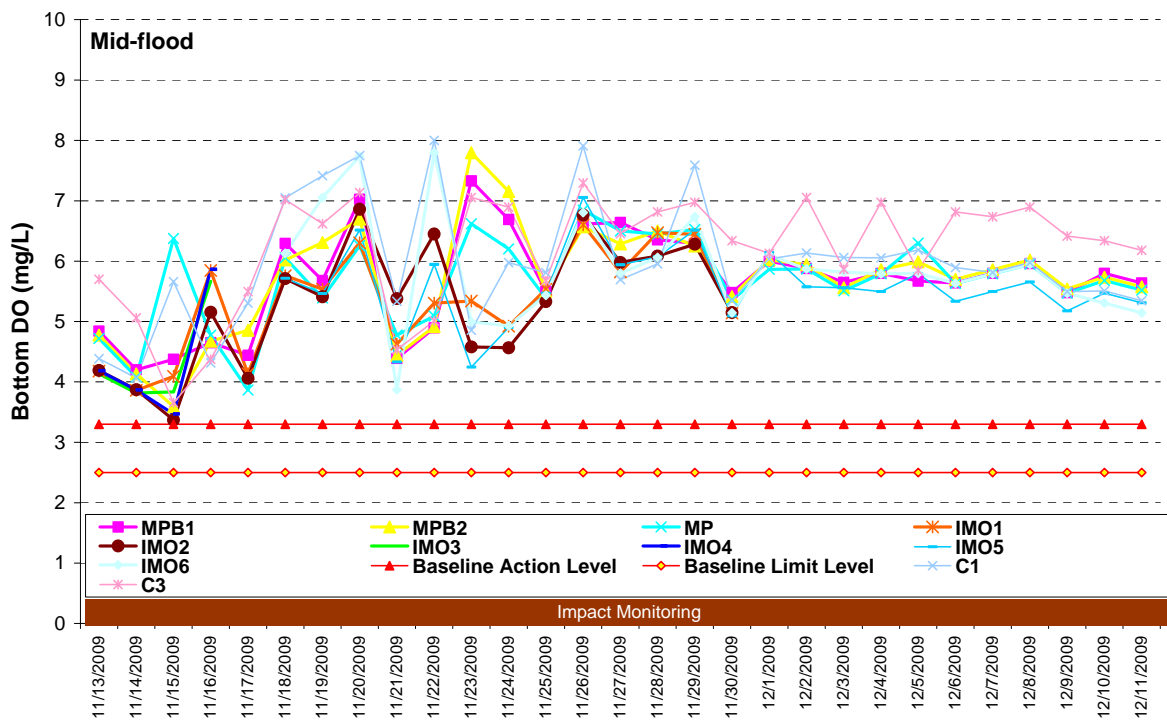
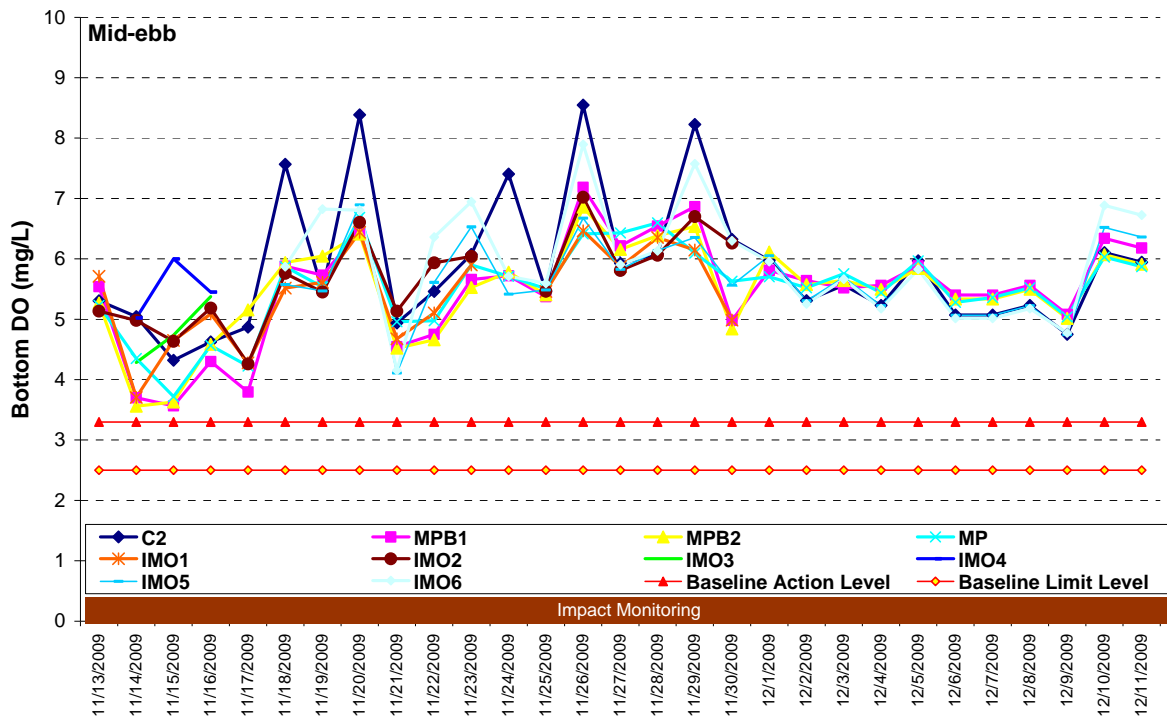


Figure F2 Dissolved oxygen concentration (bottom) (mg/L) of water samples at mid-ebb and mid-flood between 13 November and 11 December 2009

Ref: 0018105\_Annex F\_water graphs (Nov - Dec).doc



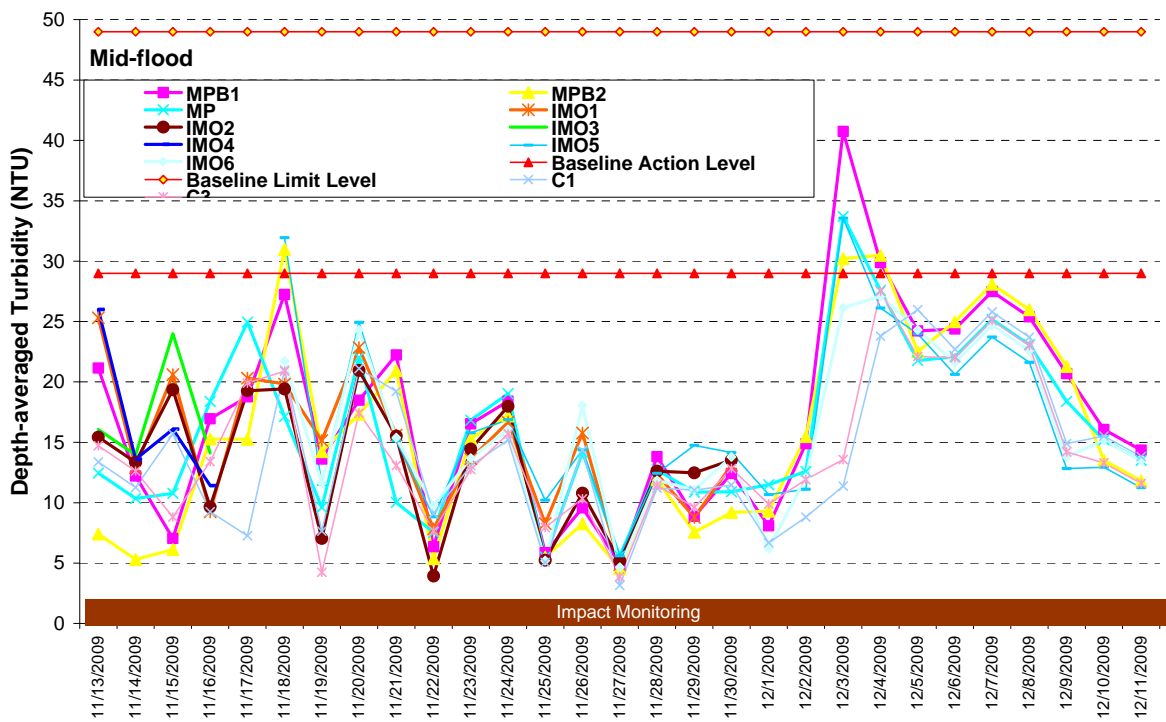
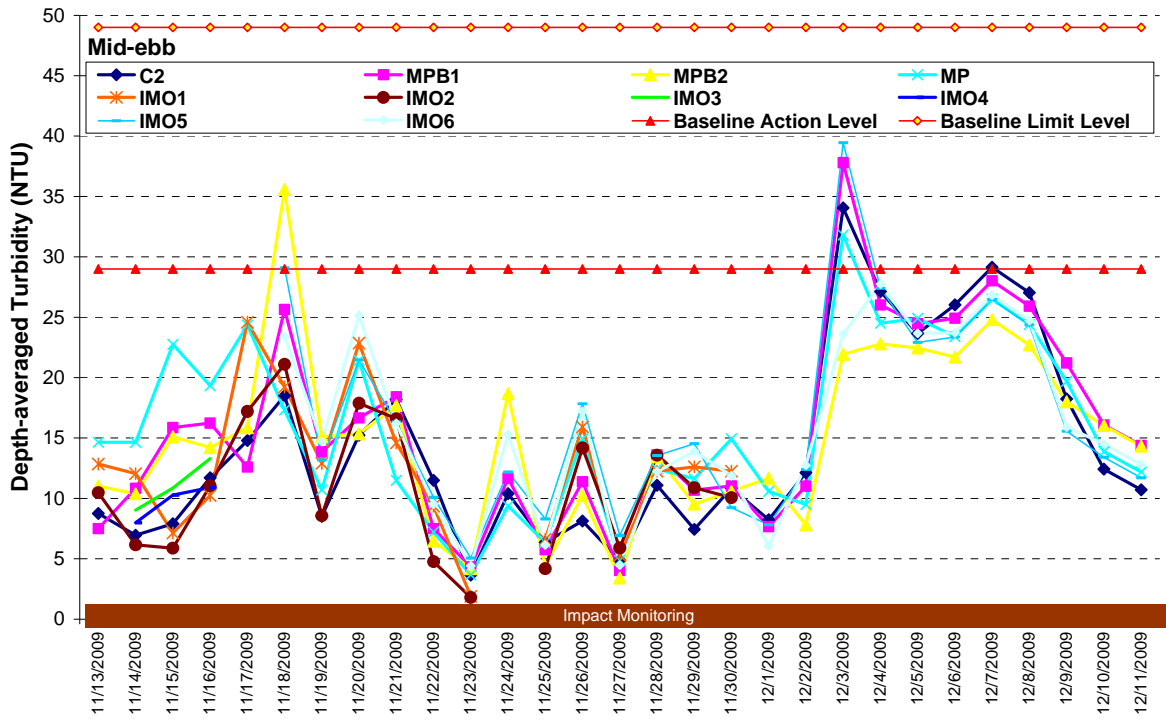


Figure F3 Depth-averaged turbidity (NTU) of water samples at mid-ebb and mid-flood between 13 November and 11 December 2009

Ref: 0018105\_Annex F\_water graphs (Nov - Dec).doc





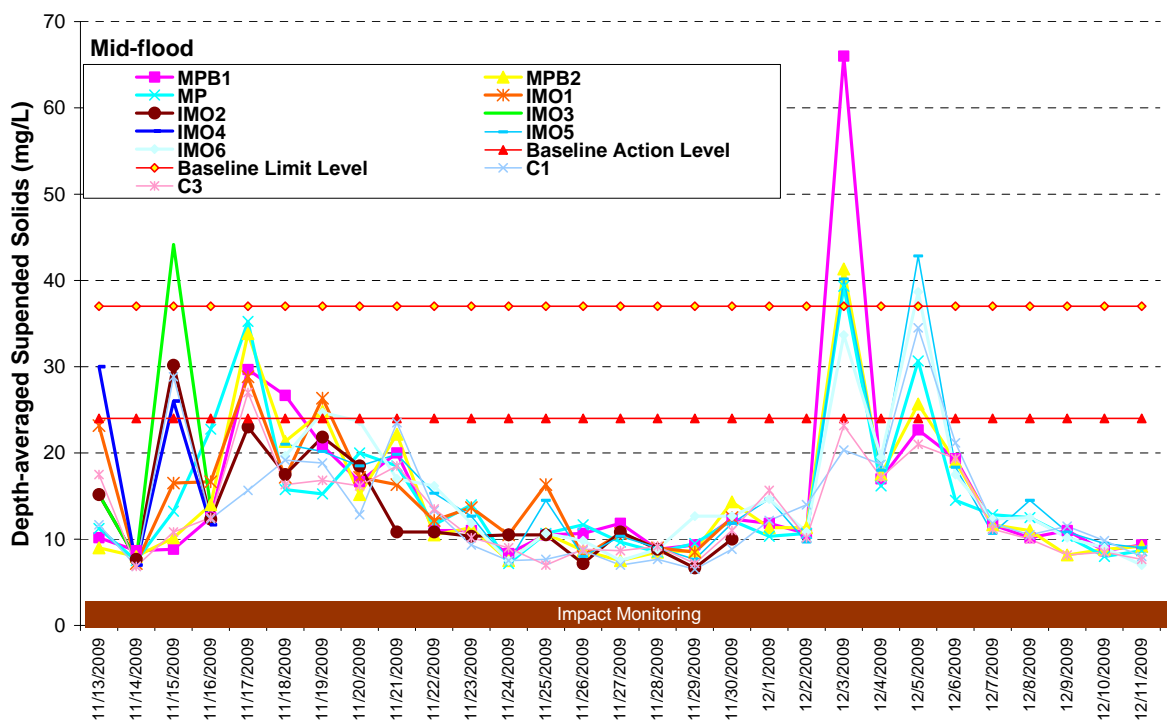
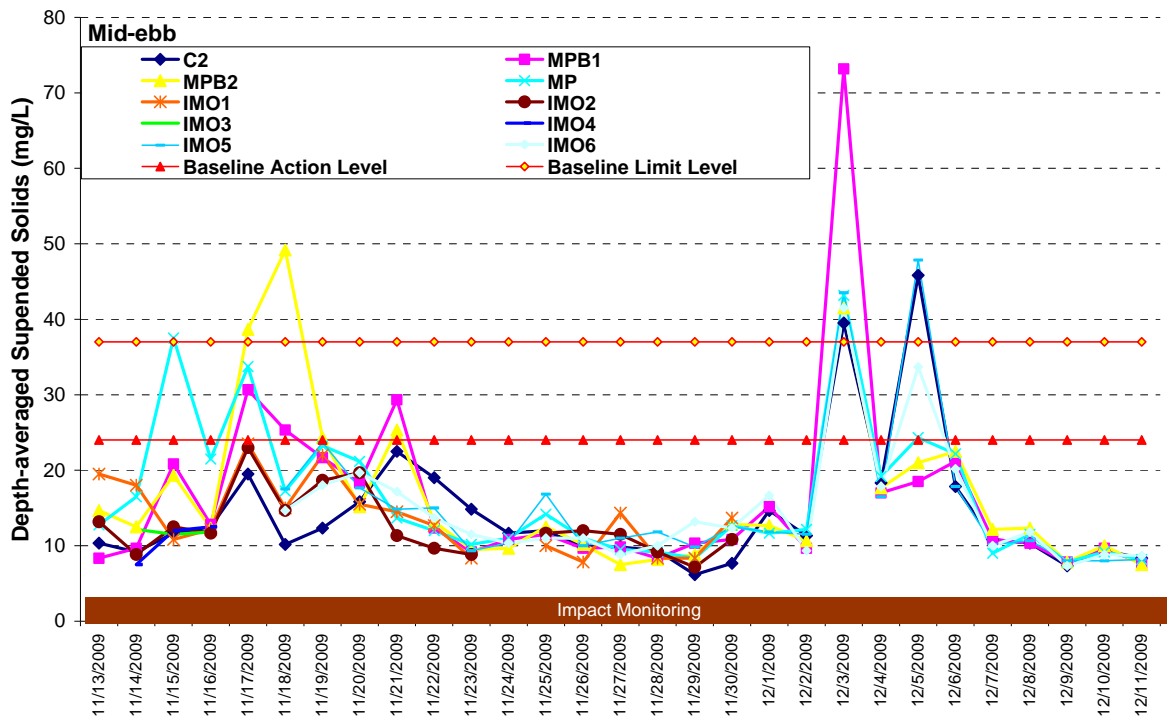


Figure F4 Depth-averaged suspended solids concentration (mg/L) of water samples at mid-ebb and mid-flood between 13 November and 11 December 2009

Ref: 0018105\_Annex F\_water graphs (Nov - Dec).doc



Annex G

## Dolphin Sighting Records

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

**Activity: Dolphin Impact Monitoring**

\*Remark: Record the number of dolphin occurrences within the 500m exclusion zone  
 (A) prior to/ outside dredging times and (B) during dredging OR (C) outside the exculsion zone

Week	Date	Derrick Lighters #38		Derrick Lighters #83		Grab dredger		Observer's Name
		No. of Dolphin Occurrence*	Sighting Sheet No.	No. of Dolphin Occurrence*	Sighting Sheet No.	No. of Dolphin Occurrence*	Sighting Sheet No.	
1	Fri 13-Nov	0	-	Not in operation		Not in operation		Alvin Lee
	Sat 14-Nov	0	-	0	0	Not in operation		Richard Huang
	Sun 15-Nov	0	-	0	0	Not in operation		Richard Huang
2	Mon 16-Nov	0	-	2 (C)	1-2	Not in operation		Alvin Lee
	Tue 17-Nov	0	-	Not in operation		0	-	Richard Huang
	Wed 18-Nov	0	0	Not in operation		Not in operation		Francesca Zino
	Thu 19-Nov	1 (C)	4	Not in operation		0	-	Richard Huang
	Fri 20-Nov	0	-	Not in operation		0	-	Alvin Lee
	Sat 21-Nov	0	-	Not in operation		0	-	Richard Huang
	Sun 22-Nov	0	-	Not in operation		0	-	Alvin Lee
3	Mon 23-Nov	Not in operation		Not in operation		0	-	Alvin Lee
	Tue 24-Nov	0	-	Not in operation		0	-	Richard Huang
	Wed 25-Nov	1 (C)	5	Not in operation		0	-	Alvin Lee
	Thu 26-Nov	0	-	Not in operation		0	-	Anson Chow
	Fri 27-Nov	0	-	Not in operation		0	-	Alvin Lee
	Sat 28-Nov	0	-	Not in operation		0	-	Richard Huang
	Sun 29-Nov	0	-	Not in operation		0	-	Alvin Lee
4	Mon 30-Nov	0	-	Not in operation		0	-	Anson Chow
	Tue 1-Dec	Not in operation		Not in operation		Not in operation [1 (A)] <sup>†</sup>		Richard Huang
	Wed 2-Dec	Not in operation		Not in operation		1 (A)	6	Anson Chow
	Thu 3-Dec	Not in operation		Not in operation		0	-	Richard Huang
	Fri 4-Dec	Not in operation		Not in operation		0	-	Anson Chow
	Sat 5-Dec	Not in operation		Not in operation		0	-	Richard Huang
	Sun 6-Dec	Not in operation		Not in operation		1 (A)	7	Alvin Lee
5	Mon 7-Dec	Not in operation		Not in operation		0	-	Anson Chow
	Tue 8-Dec	Not in operation		Not in operation		0	-	Richard Huang
	Wed 9-Dec	Not in operation		Not in operation		0	-	Anson Chow
	Thu 10-Dec	Not in operation		Not in operation		1 (B)	8	Anson Chow
	Fri 11-Dec	Not in operation		Not in operation		0	-	Anson Chow

<sup>†</sup> Dolphin monitoring was conducted, despite the Grab Dredger not operating that day

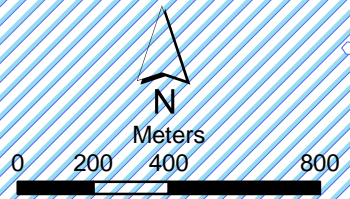
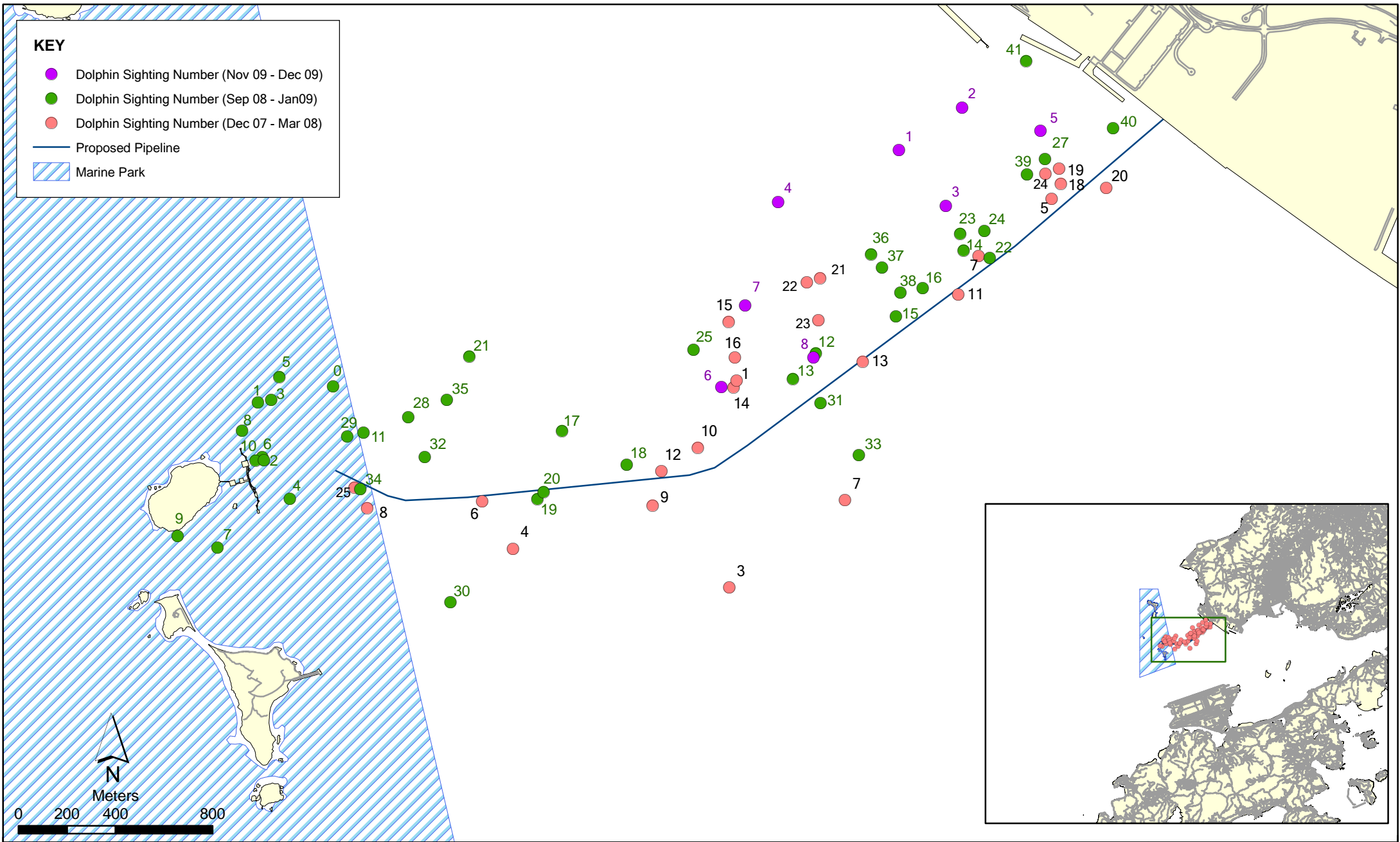
Data included in the 37th Monthly Report

Permanent Aviation Fuel Facility (PAFF) - Dolphin Sighting Records

Sighting No.	Date	Time	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	16-Nov-09	0848	825063.045	810003.667	640	278	2	Undetermined	3	None	Undetermined	Sighting at 600m during dredging
2	16-Nov-09	0939	825223.562	810220.771	600	280	1	Undetermined	3	None	Undetermined	Sighting at 640m during dredging
3	19-Nov-09	1017	825098.716	810051.912	520	250	2	1SJ, 1UA	2	None	Travelling	One sighting at 520m during dredging
4	25-Nov-09	0849	825104.661	810059.953	>1200	262	2	Undetermined	2	Shrimp	Feeding	One sighting at >1.2km from vessel during dredging
5	1-Dec-09	0820	825104.641	810060.293	166	320	1	Undetermined	2	None	Jumping	One sighting at 166m. After 20 minutes, at 560m, not during dredging. <b>NB</b> Dredger not in operation for the whole day
6	2-Dec-09	1250	824212.831	808854.207	220	260	2	Undetermined	2	None	Socializing	Sighting at 220m; after 5 minutes, at 250m. Sited during lunch break when dredger had temporarily stopped operations
7	6-Dec-09	0832	824272.284	808934.619	310	320	2	1SS, 1US	2	None	Diving	Sighting at 310m moving west and leaving exclusion zone at 0838, during pre-dredging check
8	10-Dec-09	1645	824303.921	808968.362	50	100	1	Undetermined	2	None	Spy-hopping	Sighting at 50m during dredging
*Key:			# Compass bearing is used (North = 0 degree )									
UC = Unspotted Calf												
UJ = Unspotted Juvenile												
SJ = Spotted Juvenile												
SS = Spotted Sub-adult												
SA = Spotted Adult												
UA = Unspotted Adult												
Data included in the 37th Monthly Report												

**KEY**

- Dolphin Sighting Number (Nov 09 - Dec 09)
- Dolphin Sighting Number (Sep 08 - Jan 09)
- Dolphin Sighting Number (Dec 07 - Mar 08)
- Proposed Pipeline
- ▨ Marine Park



Dolphin Sighting Locations (as of 31 December 2009)

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