

**Central Reclamation, Phase III
Environmental Monitoring & Audit
Monthly Report No. 3
October 2003**

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ACL	Atkins China Limited
CRIII	Central Reclamation Phase III
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EPD	Environmental Protection Department
ER	Engineer’s Representatives
ET	Environmental Team
IEC	Independent Environmental Checker
LCSD	Leisure and Cultural Services Department
LCSVO-JV	Leighton China State Van Oord Joint Venture
TDD	Territory Development Department
TSP	Total Suspended Particulates

Executive Summary

The Central Reclamation Phase III Works, Contract No. HK 12/02, was awarded to Leighton China State Van Oord Joint Venture (LCSVO-JV) by the Territory Development Department (TDD), Hong Kong Islands and Islands Development Office. The works under the Contract HK 12/02 commenced on 28 February 2003.

Atkins China Limited (ACL) has been appointed by TDD to implement the Environmental Monitoring and Audit (EM&A) programme that was identified in the EIA Report for the CRIII Project and is providing Environmental Team (ET) services during the duration of the construction works.

This is the third Monthly EM&A Report under the EIAO for the works specified in Section 1.3 of the CRIII EIA Report. This report summarises the monitoring results and audit findings of the EM&A programme during the reporting period from 1 October to 31 October 2003.

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. A summary of the monitoring activities performed in this reporting month is listed below:

- Environmental site inspections were undertaken on 2, 9, 16, 23 and 30 October 2003.
- Noise monitoring was performed continuously for 24 hours.
- Water quality monitoring was undertaken on the following days:
 - 1 October 2003
 - 3 October 2003
 - 6 October 2003
 - 8 October 2003
 - 10 October 2003
 - 13 October 2003
 - 15 October 2003
 - 17 October 2003
 - 20 October 2003
 - 22 October 2003
 - 24 October 2003
 - 27 October 2003
 - 29 October 2003
 - 31 October 2003

Exceedance of Action and Limit Levels

There were no environmental exceedances of air quality during the reporting period.

The noise monitoring carried out during the reporting did not find any exceedances that were attributable to the project works. Although the continuous monitoring data indicated several instances where the Leq (30 minutes) exceeded 75 dB(A), investigations into these levels found that they were due to local noise conditions at the City Hall monitoring location and were not due to the project. An off-site inspection carried out by the IEC on 21 October 2003 confirmed these findings (**Annex L**). The IEC's observations noted that the main sources of noise near City Hall were from helicopter and vehicle traffic in the area.

From the analysis of water quality monitoring results collected during the reporting period, no exceedances were found to be attributable to the project marine works. Although the monitoring data indicated that levels of dissolved oxygen (DO) and suspended solids (SS) beyond the water quality criteria were found, investigations into these exceedances determined that they were due to natural variation in ambient conditions and/or local influencing factors in proximity of the affected monitoring stations, and they were not due to the project. The investigations considered the conditions from baseline monitoring, which was conducted during February to April 2003, and results from the control stations located outside the project's influence. A review of the monitoring results showed that control stations located outside the project's influence had similar values as marine impact stations. Seawater intake monitoring data showed variable results and exceedances were found to be localised near existing stormwater outfalls. These findings were similar to the conditions observed during baseline monitoring. Further, silty discharges from outfalls within the project area were documented during the reporting month. Based on the investigations and analyses of the water quality data, it was confirmed that the project marine works did not cause any of the breaches of the water quality criteria.

Complaint Log

There were no environmental complaints received during this reporting period.

Notifications of Summons and Prosecutions

There were no notifications of summons or prosecutions received with regard to the environment during this reporting period.

Site Inspection and Audit

Site inspections for the CRIII project works area were undertaken on 2, 9, 16, 23 and 30 October 2003. During the site inspections no environmental non-compliances were found. However, one deficiency was recorded during a site inspection in the reporting period and the Contractor subsequently rectified the deficiency after being notified.

Future Key Issues

Future Key Issues are as follows:

- The Contractor submitted a proposal for variation of FEP Condition 3.2(a) dated 22 October 2003 and was received on 27 October 2003. The Contractor is requesting to perform concurrent dredging at IRAW and IRAE to avoid delays to the overall programme. The ER will provide comments on the proposal after review.
- Marine works are currently limited to marine site investigations at the Eastern Seawall, dredging and reclamation (up to the original seabed only) in area IRAW. Other marine works including marine piling and reclamation above the original seabed level have been suspended until 16 December 2003.

- Large quantities of silty discharge, from outfalls within the project area, which were unrelated to project works, have been observed and documented during October 2003. The situation has been reported to EPD and they are currently investigating the issue. It is expected that these discharges will continue and may adversely impact water quality in the area.
- Dredging at IRAE is scheduled to commence in early November 2003. The dredging work for IRAE will be limited to an area 100 m outside the heliport as the restriction applies until its relocation. Marine site investigation within this "Heliport Exclusion Zone" has not commenced and will begin after the heliport is relocated.

1. INTRODUCTION

1.1 Basic Project Information

The Territory Development Department (TDD) of the Hong Kong Special Administrative Region (HKSAR) is constructing the Central Reclamation Phase III Project (CRIII).

The Main Works Contract HK 12/02 for CRIII commenced on 28th February 2003. Leighton-China State-Van Oord Joint Venture (LCSVO-JV) was awarded the Contract No. HK 12/02 for the construction of the CRIII Engineering Works. Selected construction works recommenced on 8 October 2003 following a temporary suspension beginning on 28 September 2003. The works that were allowed to resume were marine site investigations at the Eastern Seawall, dredging works and reclamation works at IRAW, which were limited to filling to the original seabed level only.

Atkins China Limited (ACL) has been commissioned by TDD to undertake the environmental monitoring and audit work for the project in accordance with the Environmental Permit (EP No. EP-122/2002) issued to TDD on 7 March 2002. The CRIII Project Organisation is shown in **Annex A**.

This is the third monthly EM&A Report under the EIAO, which presents the results of EM&A work conducted during the period from 1 October to 31 October 2003, inclusive.

2. ENVIRONMENTAL STATUS

2.1 Works Undertaken

Selected construction works for the project recommenced on 8 October 2003. The works undertaken during the reporting month were limited to dredging at IRAW, marine site investigation at the Eastern Seawall, demolition of Pier No. 7, temporary traffic and pedestrian diversion arrangements near Pier No. 7, site investigation works for the Man Yiu Street Footbridge and rock filling at IRAW. Additionally, traffic diversions, trial pits and detection of underground services for cooling water mains have commenced at Lung Wui Road.

2.2 Environmental Permits

A summary of the status of all environmental permits, license, and/or notification to EPD for this project during the reporting period are presented in **Table 2.1**.

Table 2.1 - Summary of the Environmental License / Permit Status

Item	Item Description	Date of Application	Permit Status
1	LCSVO-JV submitted an Application for a Permit to Dump Material (Contaminated Sediment) at Sea under the Dumping at Sea Ordinance (Ref. H2189/U2c/3761/AT/CST/EY/ST/cm)	24 October 2003	Pending
2	LCSVO-JV submitted a Renewal of Construction Noise Permit GW-TS0372-03 (Ref. H2189/U2c/3675/AT/CST/EY/ST/ec)	20 October 2003	Pending
3	LCSVO-JV submitted an Application for Construction Noise Permit for the use of power mechanical equipment (PME) for the purpose of carrying out construction work other than percussive piling at Initial Reclamation Area East (Ref. H2189/U2c/3538/MP/CST/EY/ST/cm)	14 October 2003	Pending
4	LCSVO-JV submitted an Application for Construction Noise Permit for the use of power mechanical equipment (PME) for the purpose of carrying out the demolition of Link Bridge of General Post Office (Ref. H2189/U2c/3512/MP/ATA/CKA/ST/cm)	13 October 2003	Pending

2.3 Environmental Document Submission

A summary of the status of the submissions provided during the month of October 2003 is presented in **Table 2.2**.

Table 2.2 - Summary of the Contractor's Environmental Related Document Submissions to the Engineer's Representatives (ER)

Item	Document Title	Version	Date of Submission to ER
1	<i>Test Report for Marine Sediment (Ref. H2189/C1/3721/AT/CST/EY/ST/cm)</i>	0	22 October 2003
2	<i>Proposal for Variation of FEP Condition 3.2(a) (Ref. H2189/C1/3725/AT/CST/EY/ST/cm)</i>	0	22 October 2003
3	<i>IRAE - Commencement of Dredging Work (Ref. H2189/C1/3631/MP/CST/EY/atm)</i>	0	17 October 2003
4	<i>Disposal Programme for C&D Material to be Generated from Demolition of GPO Walkway (Ref. H2189/C1/3599/MP/ATA/CKA/ST/cm)</i>	0	16 October 2003
5	<i>Disposal of Chemical Waste (Trip Ticket for the disposal of chemical waste)</i>	0	7 October 2003
6	<i>Review of the Efficiency and Installation of HSBC Silt Screen (Ref. H2189/C1/3366/MP/CST/EY/atm)</i>	0	7 October 2003

A summary of the Environmental Certification Sheet submissions to EPD for the Month of October 2003 is presented in **Table 2.3**.

Table 2.3 - Summary of Environmental Certification Sheet Submissions to the Environmental Protection Department (EPD)

No	Certification Subject	Letter Ref.	Date of Submission to EPD	Approved Status
1	<i>Certification of Monthly Environmental Report No. 2 - September 2003</i>	3128/M45/200/OC5329/AC/al	15 October 2003	-

2.4 Environmental Meetings

During the reporting period the following environmental meetings were held:

- 17 October 2003 – a presentation on Water Quality Monitoring Results for August & September 2003 was provided by ACL to EPD's Local Control Office (Territory South) and site staff involved with environmental aspects of the CRIII project.

2.5 Environmental Monitoring Locations

The environmental monitoring locations are provided in **Annex C**.

3. EM&A REQUIREMENTS

3.1 Summary of Impact EM&A Requirements

The EM&A programme requires environmental monitoring for air quality, noise, water quality, waste management and landscape and visual aspects as specified in the CRIII Project EIA. The EM&A requirements for each issue area are described in subsequent sections including:

- All required monitoring parameters;
- Action and Limit Levels; and
- Event-Action Plans.

A summary of impact EM&A requirements is presented in **Table 3-1**.

Table 3.1 - Summary of Impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies	Duration
TSP	24-Hour TSP	2 Locations	Once every 6 days	During dust generating construction works
	1-Hour TSP	2 Locations	Three times in every 6 days	During dust generating construction works
Noise	Leq (30 mins), L ₁₀ , L ₉₀ .	1 Location	Continuous measurements	Two weeks before Construction and During Construction
Water Quality	Dissolved Oxygen; Salinity; Temp; Suspended Solids; Turbidity.	14 Locations	3 times a week, Mid-ebb/flood tides	During Marine Works
Waste	On-Site Waste Audit	Active Work Sites	Periodically	During Construction
	On-Site Waste Inspection			
Landscape and Visual	Audits to ensure effective implementation of mitigation measures			During Construction
General Site Conditions	Environmental Site Inspection	Works areas and areas affected by works	Periodically	During Construction

3.2 Environmental Quality Performance Limits

Environmental Quality Performance Limits for air, noise and water quality as provided in the Baseline Monitoring Report (Final) are shown in the following table.

Table 3.2 - Summary of Impact EM&A Requirements

Parameter	Station	Action Level		Limit Level	
Air Quality					
1-Hour TSP Level in $\mu\text{g}/\text{m}^3$	City Hall	460 $\mu\text{g}/\text{m}^3$		500 $\mu\text{g}/\text{m}^3$	
1-Hour TSP Level in $\mu\text{g}/\text{m}^3$	PLA	432 $\mu\text{g}/\text{m}^3$		500 $\mu\text{g}/\text{m}^3$	
24-Hour TSP Level in $\mu\text{g}/\text{m}^3$	City Hall	163 $\mu\text{g}/\text{m}^3$		260 $\mu\text{g}/\text{m}^3$	
24-Hour TSP Level in $\mu\text{g}/\text{m}^3$	PLA	154 $\mu\text{g}/\text{m}^3$		260 $\mu\text{g}/\text{m}^3$	
Noise Quality					
07:00-19:00 hrs on normal weekdays	City Hall	When one documented complaint is received		75 dB(A)	
07:00-23:00 hrs on holidays; and 1900-2300 hrs on all other days	City Hall	When one documented complaint is received		60/65/70* dB(A)	
23:00-07:00 hrs of next day	City Hall	When one documented complaint is received		45/50/55* dB(A)	
Marine Water Quality - Marine Based Stations ^A					
DO (mg/L)	Surface & Middle	4.7 mg/L		4.0 mg/L	
	Bottom	Wet	Dry	Wet	Dry
		3.2	4.9	2.0	2.0
SS (mg/L)	Depth-avg	Wet	Dry	Wet	Dry
		10	11	12	14
Turbidity (NTU)	Depth-avg	Wet	Dry	Wet	Dry
		11	14	13	18
Marine Water Quality - Seawater Intakes ^B					
DO (mg/L)	All	4.6 mg/L		3 mg/L	
SS (mg/L)	M1	11 mg/L		14 mg/L	
	M2	23 mg/L		27 mg/L	
	M3	13 mg/L		16 mg/L	
	M4	10 mg/L		12 mg/L	
	M5	12 mg/L		17 mg/L	
	M6	11 mg/L		14 mg/L	
	M11	11 mg/L		13 mg/L	
	M12	11 mg/L		12 mg/L	

Notes: A - Only for Stations M8 & M10

B - Although the majority of the intake stations are located within close proximity of each other, separate Action and Limit Levels have been established due to the number of influencing factors affecting the stations (i.e. outfalls and storm drains).

3.3 Event Action Plan

The Event Action Plans for air, noise and water quality as provided in the Baseline Monitoring Report (Final) are shown in **Annex E**.

3.4 Implementation of Environmental Measures

The Contractor is expected to implement mitigation measures listed in the EIA Report, EM&A Manual and Further Environmental Permit. During routine site inspections, the Contractor's implementation of mitigation measures is reviewed. With regard to mitigation measures for water quality, the Contractor carried out daily visual inspection of the silt screens for seawater intakes. Bi-weekly diving inspections for the silt screens were also carried out in October 2003. During the month of October, there were no records of the Contractor not implementing relevant mitigation measures.

4. MONITORING RESULTS

4.1 Impact Monitoring Schedule in October 2003

Regular site inspections were carried out to assess whether the project's environmental protection and pollution control measures are in compliance with the contract specifications. Inspections were conducted on 2, 9, 16, 23 and 30 October 2003.

Air quality monitoring has not commenced yet as no work areas or construction activities with the potential to impact air quality are within range of the closest air quality sensitive receivers.

Continuous 24-hour noise monitoring was conducted during this report period.

Impact water quality monitoring at all monitoring stations was undertaken during this reporting month. The water quality monitoring schedule for October 2003 is presented in **Table 4-1**.

Table 4.1 - Water Quality Monitoring Programme (Seawater Intakes Stations)

Date of Sampling	Tidal State	Timing of Sampling
1 October 2003	Mid Ebb	14:15 - 17:19
	Mid Flood	09:16 - 12:03
3 October 2003	Mid Ebb	07:43 - 11:07
	Mid Flood	15:32 - 18:23
6 October 2003	Mid Ebb	08:46 - 11:40
	Mid Flood	15:18 - 17:55
8 October 2003	Mid Ebb	10:00 - 12:49
	Mid Flood	15:18 - 17:51
10 October 2003	Mid Ebb	10:52 - 13:37
	Mid Flood	15:43 - 18:23
13 October 2003	Mid Ebb	12:55 - 16:22
	Mid Flood	07:43 - 10:40
15 October 2003	Mid Ebb	13:25 - 16:14
	Mid Flood	07:42 - 10:52
17 October 2003	Mid Ebb	07:14 - 10:23
	Mid Flood	14:50 - 17:34
20 October 2003	Mid Ebb	07:27 - 10:08
	Mid Flood	15:55 - 18:45
22 October 2003	Mid Ebb	08:25 - 11:38
	Mid Flood	15:25 - 18:09
24 October 2003	Mid Ebb	09:45 - 12:10
	Mid Flood	15:38 - 18:35
27 October 2003	Mid Ebb	12:24 - 14:58
	Mid Flood	07:03 - 10:52

Date of Sampling	Tidal State	Timing of Sampling
29 October 2003	Mid Ebb	13:53 - 16:34
	Mid Flood	08:41 - 12:23
31 October 2003	Mid Ebb	06:57 - 10:52
	Mid Flood	15:03 - 17:48

4.2 Monitoring Methodology

4.2.1 Air Quality Monitoring

Air quality monitoring will be performed in accordance with the methodology described in the EM&A Manual once construction activities requiring air quality monitoring commence. The locations of the monitoring stations at City Hall and PLA Headquarters are shown in **Annex C**.

4.2.2 Noise Quality Monitoring

Continuous 24-hour noise monitoring was performed in accordance with the methodology described in the EM&A Manual in October 2003. The location of the noise monitoring station at City Hall is shown in **Annex C**.

4.2.3 Water Quality Monitoring

Water quality monitoring was performed in accordance with the methodology described in the EM&A Manual. Monitoring for the month of September was conducted at all stations, which comprises of 6 marine-based stations and 8 seawater intake stations. The locations of the monitoring stations are shown in **Annex C**.

4.3 Monitoring Equipment

4.3.1 Air Quality

The equipment that is used for air quality monitoring is listed in **Table 4-2**.

Table 4.2 - Equipment for Air Quality Monitoring

Parameter Measured	Equipment
24-Hour Sampling	High Volume Sampler Model GS2310 by Anderson Instruments to be used for both monitoring stations.
1-Hour Sampling	MicroDust pro Aerosol Monitoring System to be used for both monitoring locations.

4.3.2 Noise Quality

The equipment used for continuous noise quality monitoring is listed in **Table 4-3**.

Table 4.3 - Noise Monitoring Equipment

Equipment	Model
Integrated Sound Level Meter	B&K 2238
Calibrator	B&K 4231, Class 1

4.3.3 Water Quality

The equipment that was used for water quality monitoring is listed in **Table 4-4**.

Table 4.4 - Equipment Used for Marine Water Quality Monitoring

Parameter Measured	Equipment
Dissolved Oxygen and Temperature Measuring Equipment	<p>A Dissolved Oxygen meter YSI model 58 was used.</p> <ul style="list-style-type: none"> • This instrument was portable and weatherproof and used a DC power source. The equipment was capable of measuring: • DO levels in the range of 0-20 mg/l and 0-200% saturation; and • Temperature of between 0 - 45 degree Celsius. • The equipment had a membrane electrode with an automatic temperature compensation complete with a cable. In addition, a Wirling Psychrometer was used as a reference thermometer during the sampling.
Turbidity Measurement Instrument	<p>A Turbidimeter, HACH model 2100P was used for determining turbidity levels. The instrument is portable and weatherproof and uses a DC power source. The instrument includes a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.</p>
PH	<p>A MP125 pH Meter from Mettler Toledo was used to measure pH.</p>
Salinity / Conductivity Meter	<p>A Salinity / Conductivity meter YSI model 63 and model 30 was used for determining salinity concentrations.</p>
Sample Containers and Storage	<p>Water samples for SS analysis were stored in high density polythene bottles with no preservative added, packed in ice and delivered to the laboratory, and analysed as soon as possible after collection.</p>

4.4 Impact Monitoring Results

4.4.1 Air Quality & Noise Monitoring Results

No air quality monitoring work was undertaken during the reporting period as no work areas or construction activities with the potential to impact air quality are within range of the closest air quality sensitive receivers.

Noise quality monitoring work was undertaken during the reporting period. The noise monitoring results are provided in **Annex F**. Graphical representation of the noise monitoring data is provided in **Annex G**.

4.4.2 Water Quality Monitoring Results

Water quality monitoring was undertaken at all water quality monitoring locations during the reporting period. The water quality monitoring results from this reporting period are presented in **Annex H**. Graphical representation of the water quality data is provided in **Annex I**. Summaries of the results are provided in Tables 4.5 to 4.9.

Table 4.5 - Summary of Mid-Ebb Results for Marine-Based Stations

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
C1	min	4.3	4.4	66.2	3.0	4
	max	5.9	5.9	84.6	12.6	11
	avg	5.3	5.1	76.4	6.4	8
	sd	0.5	0.5	6.0	2.3	2
C2	min	4.0	4.2	61.5	3.4	5
	max	5.8	5.8	85.3	6.4	8
	avg	5.1	5.0	74.3	4.9	6
	sd	0.5	0.5	5.3	0.9	1
M7	min	4.0	3.7	59.2	4.2	5
	max	5.3	5.2	79.7	9.8	11
	avg	4.7	4.5	68.4	6.4	8
	sd	0.4	0.4	5.4	1.4	2
M8	min	3.8	3.7	58.4	4.3	5
	max	5.5	5.4	80.0	7.8	9
	avg	4.7	4.6	69.0	5.8	7
	sd	0.5	0.5	6.1	1.0	1
M9	min	3.8	3.9	59.5	4.5	6
	max	5.3	5.4	81.3	8.2	10
	avg	4.8	4.7	70.1	6.4	8
	sd	0.4	0.4	6.2	1.0	1
M10	min	3.7	3.8	57.3	4.4	5
	max	5.5	5.6	81.9	8.3	10
	avg	4.9	4.8	70.7	6.0	8
	sd	0.4	0.5	6.0	1.0	1

Monitoring stations M8 and M10 were selected as the marine-based impact stations as they are located outside the predicted influence of the dredging and reclamation works. The detection of water quality degradation at these two stations may indicate that project marine works are adversely affecting water quality in Victoria Harbour. Stations M7 and M9 are within the expected influence of the reclamation activities and are located along the works area boundary (or extent of the predicted sediment plume). As such, M7 and M9 are used as indicator stations only. They are used to note any significant elevations in SS, turbidity or reductions in DO that may affect the marine-based impact monitoring stations.

As Table 4.5 shows, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer during mid-ebb survey ranged between 3.7 and 5.5 mg/L with an average value of 4.8 mg/L and DO measurements in the bottom layer ranged from 3.7 to 5.6 mg/L with an average level of 4.7 mg/L. Similar DO levels were recorded at the control stations at which DO levels in the surface to middle layer during mid-ebb survey ranged from 4.0 to 5.9 mg/L with an average value of around 5.2 mg/L; DO measurements in the bottom layer ranged between 4.2 and 5.9 mg/L with an average level of 5.1 mg/L.

SS levels during mid-ebb tide ranged from 5 to 10 mg/L with an average value of 7 mg/L at the marine-based impact stations (M8 & M10), which is comparable to results from the control stations in which SS content ranged from 4 to 11 mg/L with an average of 7 mg/L. The results showed no clear gradient effect (high SS and low DO levels from near-field stations M7 and M9 to far-field stations M8 and M10), which indicated that dredging works are not adversely affecting marine water quality outside the work site boundary in Victoria Harbour. Based on these analyses, it was determined that marine water quality at impact monitoring stations was similar to that at the control stations. Therefore, the marine-based water quality results during the reporting period did not indicate that project marine works were adversely affecting water quality in Victoria Harbour.

Table 4.6 - Summary of Mid-Flood Results for Marine-Based Stations

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
C1	min	4.0	3.8	60.4	4.1	5
	max	6.2	5.9	88.2	12.6	13
	avg	5.3	5.1	77.1	6.4	8
	sd	0.6	0.7	8.3	2.1	2
C2	min	3.6	3.7	54.7	3.3	5
	max	5.6	5.4	83.6	7.2	9
	avg	4.9	4.7	71.2	5.6	7
	sd	0.5	0.5	7.1	1.2	2
M7	min	3.5	3.7	54.5	4.2	5
	max	5.3	5.2	79.7	9.8	12
	avg	4.5	4.4	65.6	7.0	8
	sd	0.4	0.4	6.1	1.6	2
M8	min	3.9	3.9	58.8	3.6	6
	max	5.6	5.3	80.2	10.5	13
	avg	4.8	4.7	69.8	6.8	8
	sd	0.4	0.4	5.5	1.6	2
M9	min	3.6	3.8	56.0	4.7	6
	max	5.0	5.1	73.1	8.1	11
	avg	4.5	4.5	66.5	6.9	8
	sd	0.3	0.4	4.9	1.0	2

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
M10	min	3.9	3.8	58.4	3.6	5
	max	5.4	5.2	76.0	10.3	14
	avg	4.8	4.6	69.4	7.1	9
	sd	0.4	0.4	4.8	1.9	3

During mid-flood tide, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer ranged from 3.6 to 5.6 mg/L with an average level of 4.8 mg/L while DO values in the bottom layer ranged between 3.8 and 5.3 mg/L with an average of 4.7 mg/L. Similar DO concentrations were recorded at the control stations in the surface to middle layer during mid-flood survey ranged between 3.6 and 6.2 mg/L with an average value of 5.1 mg/L and DO results in the bottom layer ranged from 3.7 and 5.9 mg/L with an average of 4.9 mg/L.

SS content ranged between 5 and 14 mg/L (for stations M8 & M10) with an average of 9 mg/L during mid-flood tide and ranged from 5 to 13 mg/L with an average value of 7 mg/L at the control stations. Again, the results showed no clear gradient effect and no significant difference between control stations and marine-based impact stations. Therefore, the marine-based results indicated that the dredging works are not adversely affecting water quality outside the work site boundary.

Table 4.7 - Summary of Mid-Ebb Results for Seawater Intake Stations

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M1	min	3.6	55.1	6.2	6
	max	4.5	66.8	12.4	16
	avg	4.1	62.5	8.0	9
	sd	0.2	3.6	1.7	3
M2	min	3.5	53.5	6.5	10
	max	4.4	67.8	15.7	32
	avg	4.0	61.1	9.1	15
	sd	0.3	4.5	2.4	6
M3	min	3.3	49.9	3.9	6
	max	4.7	72.0	14.1	27
	avg	4.1	62.1	7.7	12
	sd	0.4	6.4	2.8	6

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M4	min	3.5	50.8	4.0	6
	max	4.8	71.1	10.4	15
	avg	4.2	63.4	6.5	9
	sd	0.4	5.8	2.0	3
M5	min	3.7	57.2	4.6	6
	max	5.2	79.4	8.7	15
	avg	4.4	66.5	6.6	9
	sd	0.4	6.6	1.2	2
M6	min	3.2	48.8	4.3	6
	max	4.8	73.2	8.4	14
	avg	4.2	62.8	6.2	9
	sd	0.4	6.3	1.1	3
M11	min	3.6	54.8	5.2	7
	max	4.6	67.8	9.7	11
	avg	4.2	62.5	6.7	9
	sd	0.2	3.5	1.4	1
M12	min	3.0	46.1	4.1	5
	max	4.4	65.0	9.7	14
	avg	4.0	59.8	6.1	9
	sd	0.3	4.8	1.7	2

Seawater intake monitoring stations M1 to M6, M11 and M12 are located within the works area boundary to monitor water quality at the sensitive receivers. These stations are used to detect DO and SS levels at the specific intake locations and do not reflect the general water quality condition within Victoria Harbour. The intake stations are used to monitor any significant elevations in SS or reductions in DO that may adversely affect seawater intake operations.

Seawater intake results during mid-ebb tide, Table 4.7, show that DO levels ranged from 3.3 to 5.2 mg/L with an average of 4.2 mg/L. SS ranged between 5 and 32 mg/L with an average value of 10 mg/L. The above results show that water quality at seawater intake stations, particularly at M2 and M3, was generally poorer than that at marine-based stations. Such an effect is expected as the baseline monitoring results have demonstrated similar conditions. The low DO levels are attributable to adverse influencing factors such as discharges from outfalls in proximity to the monitoring points and poor seawater flushing in the area. Localised high SS levels were also recorded at distant stations M6 and M12, which are outside the influence of project marine works at the current stage, on several occasions. The poor water quality at M6 is also due to adverse impacts from outfalls located adjacent to the station. During the reporting month large quantities of silty discharges from outfalls were observed and documented near stations M5 and M6 on various occasions. Observations noted that the large patches of brown silty water generally dispersed westwards after discharge from the outfall. A figure showing the location of various outfalls along the seawall within the project area is shown in **Annex C**.

Table 4.8 - Summary of Mid-Flood Results for Seawater Intake Stations

Station		Parameter			
		DO mg/L	DO % Sat.	Turbidity NTU	SS mg/L
M1	min	3.6	56.4	4.8	6
	max	4.9	74.1	9.9	14
	avg	4.3	65.3	8.1	9
	sd	0.4	5.2	1.4	2
M2	min	3.3	50.5	6.7	9
	max	4.7	69.4	19.2	43
	avg	4.1	61.5	9.3	15
	sd	0.4	5.7	2.9	9
M3	min	3.3	50.0	5.1	8
	max	5.0	73.6	11.4	23
	avg	3.9	59.2	8.3	13
	sd	0.5	6.5	2.0	4
M4	min	3.2	49.3	4.6	6
	max	4.7	70.5	11.4	14
	avg	4.2	64.0	7.6	10
	sd	0.4	5.9	2.1	2
M5	min	3.5	53.2	3.8	6
	max	5.1	74.9	9.7	10
	avg	4.3	64.8	6.8	8
	sd	0.5	7.9	1.5	1
M6	min	2.6	39.8	4.3	7
	max	5.8	85.7	13.5	17
	avg	4.0	59.7	8.3	11
	sd	0.7	10.3	2.8	3
M11	min	3.5	52.6	3.8	7
	max	4.7	70.4	12.9	18
	avg	4.3	64.1	8.0	11
	sd	0.4	5.7	2.4	4
M12	min	3.3	50.7	4.6	6
	max	4.6	67.7	15.2	17
	avg	4.1	61.2	7.6	10
	sd	0.3	4.8	2.9	3

During mid-flood survey, Table 4.8 shows that DO levels at seawater intake stations ranged from 2.6 to 5.8 mg/L with an average of 4.2 mg/L. SS ranged from 6 to 43 mg/L with an average SS content of 11 mg/L. The above results show that water quality at seawater intake stations, particularly at M2 and M3, was generally poorer than that at marine-based stations. Such an effect is expected as the baseline monitoring results have demonstrated similar conditions. The low DO levels are attributable to adverse influencing factors such as discharges from outfalls in

proximity to the monitoring points and poor seawater flushing in the area. Station M11 recorded high SS levels on a few occasions but investigations into the levels determined that they were not due to project works as other stations near the dredging works recorded significantly lower levels during the same sampling time. Localised high SS levels were also recorded at distant stations M6 and M12, which are outside the influence of project marine works at the current stage, on several occasions. The poor water quality at M6 is due to adverse impacts from outfalls located adjacent to the station. As mentioned previously, large quantities of silty discharges from outfalls near stations M5 and M6 have been observed and documented on various occasions during the reporting month. A figure showing the location of various outfalls along the seawall within the project area is shown in **Annex C**.

4.4.3 Waste Management

No waste management audit was scheduled within this reporting period. The arrangement of waste management audit will be detailed in the Waste Management Plan.

4.4.4 Landscape and Visual

As the works undertaken during the reporting month were related to site investigation works, minor demolition works and dredging works, the landscape and visual impacts are considered to be minimal.

5. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

5.1 Environmental Exceedances

The total number of exceedances for air, noise and water quality are presented in following sections.

5.1.1 Air Quality

No exceedances of air quality were observed as no air quality monitoring work was undertaken during the reporting period.

5.1.2 Noise Quality

No exceedances of noise quality attributable to project works were observed during the reporting period. Although there were 4 instances where the Leq (30 minutes) was found to be above 75 dB(A), these levels were determined to be not due to project works. The noise monitoring station situated at City Hall is under the influence of a variety of noise sources in the area that include helicopter traffic and vehicle movement at the drop off area in front of City Hall. Pedestrian activity in the area is another contributor of noise and tour groups are also frequently dropped off in the area. Additionally, it was noted that no discernible noise above the ambient level from project works could be heard during site visits. This finding has been confirmed by the IEC during similar site visits in the reporting period (**Annex L**).

5.1.3 Water Quality

Based on investigations and analyses of water quality monitoring results collected during the reporting month, it was found that no exceedances of the Action and Limit Levels were attributable to the project marine works. Although DO levels below the Action Level were observed, investigations found that they were due to natural variation or changes in ambient conditions and not caused by the project marine works. The October 2003 monitoring results indicated occasional elevated concentrations of SS above the Action and/or Limit Level at localised seawater intake stations. Investigations into these monitoring results found that the high SS levels may be due to discharge influences from outfalls located in proximity of seawater intake monitoring stations. All of the high SS concentrations recorded were shown to be localised conditions as no sediment plumes were detected at marine-based impact stations and no unusual concentrations were measured at adjacent monitoring stations during the same time. For example, there were on occasion high SS levels at station M4 while considerably lower levels were recorded at stations M1 and M11, which are closer to the dredging area. Additionally, these high SS levels were often recorded at locations (stations M1 to M6) with outfalls and stormwater culverts that discharge into the harbour. Such occasional localised elevated concentrations have been demonstrated during baseline monitoring.

It was noted that during the reporting month, water quality at marine-based impact monitoring stations (M8 and M10) was similar to the control stations. The DO concentrations of less than 4.7 mg/L commonly recorded during this period was also consistent with EPD's routine water quality monitoring results during the month of September in recent years (see **Annex K**). As the Contractor's works were not responsible for the elevated levels of SS, no remedial actions were required.

5.1.4 Waste Management

No non-compliances with regard to waste management were recorded in the reporting month.

5.1.5 Landscape and Visual

No non-compliance with regard to landscape and visual aspects were recorded in the reporting month.

5.1.6 Site Environmental Audit

No environmental non-compliances were found during environmental site inspections conducted during the reporting period. A joint site environmental inspection with the IEC was conducted on 30 October 2003.

During the inspection carried out on 30 October 2003, a small grease patch was found on the decking of the marine site investigation barge Wharf. The Contractor was notified of this deficiency and agreed to clean the grease patch during the site inspection.

5.2 Environmental Complaint and Prosecution

No environmental complaints were received during the reporting period. Further, no environmental prosecution notices or summons were received during the reporting period.

6. FORECAST AND SCHEDULE

6.1 Key Issues for the Coming Month

The key issues to be considered in the coming month include the following:

- The Contractor has proposed to commence dredging at IRAE in November before completion of dredging at IRAW as they are unable to dredge in a small area near the Star Ferry berthing zone during ferry operation hours. The Contractor has also proposed to carry out alternate dredging at IRAE and IRAW to complete the remaining part of IRAW within the Star Ferry operation zone. Comments on the proposals have been provided by the ET and the Contractor is in the process of making amendments to the proposal;
- The demolition of Pier No. 7 is progressing in-line with the Contractor's work programme. However, the postponement of the reconstruction work is being considered following discussions between TDD, Atkins and the Contractor.

6.2 Monitoring Schedules for the Next 3 Months

The construction works scheduled in November 2003 include dredging at IRAE, demolition of Pier No. 7, marine site investigation for the Eastern Seawall and site investigation works. Based on the Contractor's programme, the Environmental Monitoring Programme for the next three months is planned as follows:

TSP (24 hr and 1 hr monitoring)

Upon commencement of dust generating activities within range of the closest air quality sensitive receiver, dependent upon the Contractor's programme.

Noise (Continuous Measurements)

The noise monitoring programme throughout the entire construction period is 24-hour continuous.

Water Quality Monitoring

The water quality monitoring schedule for the next 3 months is provided in the following table.

Table 6.1 - Water Quality Monitoring Programme

Date of Sampling	Sampling Time	
3 November 2003	08:30	15:48
5 November 2003	09:56	16:40
7 November 2003	11:17	17:00
10 November 2003	12:00	17:30
12 November 2003	08:30	14:00
14 November 2003	09:30	14:53
17 November 2003	08:30	17:00
19 November 2003	08:30	15:18

Date of Sampling	Sampling Time	
21 November 2003	09:58	16:14
24 November 2003	12:00	17:30
26 November 2003	08:30	14:00
28 November 2003	09:30	15:18
1 December 2003	08:30	14:10
3 December 2003	08:30	15:18
5 December 2003	10:03	16:12
8 December 2003	11:30	17:00
10 December 2003	12:00	17:30
12 December 2003	09:00	14:30
15 December 2003	08:00	16:01
17 December 2003	12:00	17:30
19 December 2003	08:30	14:48
22 December 2003	11:23	16:38
24 December 2003	08:00	13:30
26 December 2003	09:00	14:38
29 December 2003	12:00	17:30
31 December 2003	08:30	14:00

6.3 Construction Programme for the Next 3 Months

The construction programme for the next 3 months is provided in **Annex B** and will be updated by the Contractor.

The ET will follow the Contractor's proposed programme to ensure the compliance of environmental performance and proper implementation of all necessary mitigation measures.

7. CONCLUSION

During the reporting period, no exceedances of environmental performance criteria were found to be caused by the project works. For water quality monitoring, low DO levels and elevated SS concentrations recorded were investigated and have been attributed to either ambient conditions or adverse influencing factors unrelated to project marine works. It was found that discharges from outfalls and stormwater culverts located near seawater intake monitoring stations are major influencing factors that adversely impact water quality within the works site area.

The marine-based impact monitoring stations established to monitor the overall impact of the reclamation activities on water quality in Victoria were shown to have similar results as the control stations which are located outside the influence of project works. As such, the water quality monitoring results did not indicate that the marine works were adversely affecting water quality outside the works boundary in Victoria Harbour.

One deficiency was recorded on an environmental site inspection during the reporting period. The Contractor subsequently rectified the deficiency after being notified.

The monitoring work for this reporting month has been independently verified by the Independent Environmental Checker (IEC) and has been found to be in compliance with the requirements of the EM&A programme.

Annex A

Project Organisation/ Contact Information

Annex B

Contractor's Work Programme

Annex C

Location of Monitoring Stations & Outfalls

Annex D

***Environmental Quality Performance Limits
for Air, Noise and Water Quality***

Annex E

***Event and Action Plan for Air, Noise and
Water Quality***

Annex F

Noise Monitoring Results

Annex G

***Graphical Representation of Noise
Monitoring Results***

Annex H

Water Quality Monitoring Results

Annex I

***Graphical Representation of Water Quality
Monitoring Results***

Annex J

Water Quality Exceedance Review

Annex K

EPD Water Quality Monitoring Data

Annex L

IEC Site Inspection Reports