

**Central Reclamation, Phase III
Environmental Monitoring & Audit
Monthly Report No. 17
December 2004**

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ACL	Atkins China Limited
CEDD	Civil Engineering and Development Department
CRIII	Central Reclamation Phase III
EIA	Environmental Impact Assessment
EIAO	Environmental Impact Assessment Ordinance
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
WMP	Waste Management Plan

Executive Summary

The Central Reclamation Phase III (CRIII) Works, Contract No. HK 12/02, was awarded to Leighton China State Van Oord Joint Venture (LCSVO-JV) by the Territory Development Department (now called the Civil Engineering and Development Department (CEDD) after the merger of the Civil Engineering Department and the Territory Development Department on 1 July 2004), Hong Kong Islands and Islands Development Office. The works under the Contract HK 12/02 commenced on 28 February 2003. Contract HK 16/03 for the CRIII Hinterland Drainage Improvement Works was awarded to Wang Kee Construction Co. Ltd. and works for this contract commenced on 17 December 2003.

Atkins China Limited (ACL) has been appointed by CEDD 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 seventeenth 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 to 31 December 2004.

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 3, 9, 16, 23 and 30 December 2004.
- Noise monitoring was interrupted between 3 December and 23 December 2004 due to external renovation works at City Hall, which caused power disruptions to the noise meter.
- Water quality monitoring was undertaken on the following days:
 - 1 December 2004
 - 3 December 2004
 - 6 December 2004
 - 8 December 2004
 - 10 December 2004
 - 13 December 2004
 - 15 December 2004
 - 17 December 2004
 - 20 December 2004
 - 22 December 2004
 - 24 December 2004
 - 27 December 2004

- 29 December 2005
- 31 December 2005

Exceedance of Action and Limit Levels

There was no environmental air quality monitoring required during the reporting period.

Noise quality exceedances were recorded on 24, 26 and 31 December 2004. However, investigations into these exceedances found that they were not due to the project works. The noise levels were attributable to passer-by activities at the drop-off area in front of City Hall. Further, there are no project works located in the vicinity of City Hall. External contractors however are still undertaking exterior renovation works at City Hall and these works have a direct influence on noise monitoring.

From the analysis of water quality monitoring results collected during the reporting period, exceedances of the Action and Limit Levels were found on several occasions. Although DO levels below the Action Level were observed at seawater intake and marine-based stations, investigations found that they were due to natural variation or changes in ambient conditions and not caused by the project marine works. It was noted that when the DO Action and/or Limit Levels were exceeded at the marine-based stations the control stations recorded similar DO levels.

Elevated concentrations of SS were recorded on 1, 3, 6, 17 and 22 December 2004. These exceedances were investigated and were found to be attributable to poor ambient conditions and/or influences not related to project works. The investigations generally found no significant gradient effects between those stations close to the project works and those more remote to the works area. However, the exceedances recorded on 17 December 2004 may have been attributed to sand filling works at IRAW. All parties were immediately informed of the exceedances and a subsequent site inspection noted that appropriate mitigation measures were implemented at the works. No further impacts at IRAW were observed.

Complaint Log

No environmental complaints were received during the 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

Environmental site inspections for the CRIII project works area were undertaken on 3, 9, 16, 23 and 30 December 2004. A joint inspection was carried out with the IEC on 9 December 2004.

Key Works for the Coming Month

Future key works are as follows:

- In-situ work for the pumping stations installed at IRAW;
- Piling works at Pier No. 8 and concreting of piles and pile caps;
- Removal of piling obstructions at Public Pier West and piling works;
- Site investigation for and the installation of pre-bored H-piles for the CTB piling works, as well as substructure / superstructure works;
- Architectural works for Pier No. 7;
- Vibro-compaction to sand fill at IRAW;
- Rock filling and sand filling works at IRAE;
- Installation of pre-cast caissons at IRAE;
- Bored-pile foundations for the Eastern Seawall;
- Temporary intake pipes installation;
- Land piling work for the Man Yiu Street Footbridge;
- Concrete repair works to Existing Culvert F;
- Cooling watermain work; and
- Maintenance and necessary repair works for seawater intake silt screens.

1. INTRODUCTION

1.1 Basic Project Information

The Territory Development Department (now called the Civil Engineering and Development Department (CEDD) after the merger of the Civil Engineering Department and the Territory Development Department on 1 July 2004) of 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. Contract HK 16/03 for the CRIII Hinterland Drainage Improvement Works was awarded to Wang Kee Construction Co. Ltd. and works for this contract commenced on 17 December 2003.

Atkins China Limited (ACL) has been commissioned by TDD (now called CEDD) 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 seventeenth monthly EM&A Report under the EIAO, which presents the results of EM&A work conducted during the period from 1 to 31 December 2004, inclusive.

2. ENVIRONMENTAL STATUS

2.1 Works Undertaken

The works undertaken during the reporting month include obstruction clearing for marine piles, sand and rock filling works at IRAW, filter layer laying at IRAW, in-situ work for pumping stations, seawall block installations, placing of armour rock and levelling stone works, dredging, surcharge material works, landside cooling watermain works, substructure works for the Central Terminal Building (CTB), land piling for the Man Yiu Street footbridge and CTB, temporary intake pipes installation and maintenance and necessary repair work for seawater intake silt screens.

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	<i>Application for Renewal of Construction Noise Permit (GW-RS0571-04) for the use of Powered Mechanical Equipment for the purpose of carrying out Construction Work other than percussive piling (Ref. H2189/U2c/11248/AT/DC/CKA/ST/ec).</i>	21 December 2004	–
2	<i>Application for Construction Noise Permit for Cooling Water Pipeline Connection Works near General Post Office (Ref. H2189/U2c/11246/AT/DC/KTY/ST/ec).</i>	21 December 2004	–
3	<i>Application for Construction Noise Permit for Unloading, Transporting and Storage of Pre-cast Caissons Units (Package 2 & 4, Repositioning C25 & C26) and Erection of Two Tower Cranes in Victoria Harbour during Night-time (Ref. H2189/U2c/11239/AT/EY/ST/ec)</i>	20 December 2004	–
4	<i>Test Report for Treated Effluent for Wastewater Discharge Licence No. EP880/W10/XX0195 9Ref. H2189/U2c/11021/MP/DC/ST/ec)</i>	8 December 2004	–
5	<i>Application for Renewal of Construction Noise Permit GW-RS0457-04</i>	2 December 2004	–

2.3 Environmental Document Submission

A summary of the status of the submissions provided during the reporting month 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>Advance Notification of Night-time Construction Work (Ref. H2189/C1/11276/AT/EY/ST/atm).</i>	-	23 December 2004
2	<i>Working Paper on Options, Evaluation and Recommendations of Temporary Storage of Precast Caissons (Ref. H2189/C1/11208/AT/ET/ST/atm).</i>	-	20 December 2004
3	<i>Temporary Noise Barrier for DSD Entrustment Works at Lung Wui Road (Ref. H2189/C1/10941/MP/DC/CKA/ST/cm)</i>	-	3 December 2004

A summary of the Environmental Certification Sheet submissions to EPD during the reporting month 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. 16 - November 2004</i>	<i>3128/M45/200/OC6722/SB/AC/al</i>	<i>13 December 2004</i>	-

2.4 Environmental Meetings

An environmental meeting was held with the Contractor, Hyder Consulting, the RE and ET on 20 December 2004 to discuss the Contractor's proposed temporary storage of pre-cast caissons units at FRAE. Comments were provided at the meeting on the proposal and the Contractor will be submitting a new proposal and report for review.

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 Annex D.

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 required 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 has installed frame type silt curtains for rock filling works to reduce SS dispersion. Further, the Contractor carried out daily visual inspection of the silt screens for seawater intakes. Floating debris in the project area was collected at least once everyday and in the water body near cooling water intakes debris was collected at least three times a day. Bi-weekly diving inspections for the silt screens were also carried out during the reporting month.

4. MONITORING RESULTS

4.1 Impact Monitoring Schedule in December 2004

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 3, 16, 23 and 30 December 2004.

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

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

Impact water quality monitoring at all monitoring stations was undertaken during this reporting month. The water quality monitoring schedule for December 2004 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 December 2004	Mid Ebb	12:37 - 15:32
	Mid Flood	07:15 - 10:50
3 December 2004	Mid Ebb	06:48 - 10:42
	Mid Flood	14:00 - 17:00
6 December 2004	Mid Ebb	07:39 - 10:55
	Mid Flood	12:36 - 16:11
8 December 2004	Mid Ebb	08:22 - 12:18
	Mid Flood	13:39 - 17:10
10 December 2004	Mid Ebb	09:43 - 13:36
	Mid Flood	14:48 - 17:33
13 December 2004	Mid Ebb	12:30 - 15:00
	Mid Flood	07:44 - 10:36
15 December 2004	Mid Ebb	13:27 - 16:03
	Mid Flood	08:48 - 12:07
17 December 2004	Mid Ebb	15:17 - 17:50
	Mid Flood	10:20 - 13:17
20 December 2004	Mid Ebb	07:37 - 10:53
	Mid Flood	12:22 - 15:02
22 December 2004	Mid Ebb	08:15 - 10:48
	Mid Flood	13:21 - 16:10
24 December 2004	Mid Ebb	09:35 - 12:35
	Mid Flood	14:21 - 17:07
27 December 2004	Mid Ebb	10:52 - 13:44

Date of Sampling	Tidal State	Timing of Sampling
	Mid Flood	15:22 - 18:11
29 December 2004	Mid Ebb	12:42 - 15:30
	Mid Flood	07:39 - 10:51
31 December 2004	Mid Ebb	13:12 - 15:53
	Mid Flood	09:09 - 11:58

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 the reporting period. 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 reporting month 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 (SLM)	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>

4.3.4 Equipment Calibration

The calibration frequencies of the monitoring equipment are provided in **Table 4.5**.

Table 4.5 - Equipment Calibration Frequencies

Equipment	Calibration Frequency	Latest Calibration Date
Dissolved Oxygen Meter	Every 6 months	26 October 2004
Turbidimeter	Every 3 months for secondary standards; meter is calibrated prior to each measurement to the secondary standards	26 October 2004
pH Meter	Prior to each sampling day	–
Psychrometer	Every 6 months	5 October 2004
Integrated SLM	Every year	20 August 2004

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 significantly dusty 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**.

Marine-Based Stations

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 to note any significant elevations in SS, turbidity or reductions in DO that may affect the marine-based impact monitoring stations.

Table 4.5 is a summary of the marine-based stations monitoring results during mid-ebb tide.

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	5.3	5.1	70.3	2.7	4
	max	6.1	6.1	80.7	8.0	7
	avg	5.7	5.6	76.1	4.3	6
	sd	0.3	0.3	3.8	1.6	1
C2	min	5.3	5.1	69.2	2.3	4
	max	6.1	6.2	81.0	6.0	7
	avg	5.8	5.6	76.3	4.2	6
	sd	0.3	0.4	3.3	1.3	1
M7	min	4.8	5.0	67.4	2.8	4
	max	6.0	6.0	79.8	6.6	6
	avg	5.4	5.5	72.6	3.9	5

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
	sd	0.3	0.4	3.4	1.3	1
M8	min	5.1	5.1	68.4	2.4	4
	max	6.3	6.3	82.7	6.4	7
	avg	5.8	5.7	76.9	4.4	6
	sd	0.4	0.4	4.6	1.2	1
M9	min	4.9	5.0	68.9	2.6	4
	max	5.9	6.2	79.5	7.3	8
	avg	5.5	5.5	73.8	4.2	6
	sd	0.3	0.4	3.7	1.4	1
M10	min	5.2	5.0	70.9	2.7	5
	max	6.2	6.1	81.9	7.2	7
	avg	5.7	5.6	75.6	4.1	6
	sd	0.3	0.3	3.2	1.3	1

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 5.0 and 6.3 mg/L with an average value of 5.7 mg/L and DO measurements in the bottom layer ranged from 5.0 to 6.3 mg/L with an average level of 5.6 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 5.3 to 6.1 mg/L with an average value of around 5.8 mg/L; DO measurements in the bottom layer ranged between 5.1 and 6.2 mg/L with an average level of 5.6 mg/L.

SS levels during mid-ebb tide ranged from 4 to 7 mg/L with an average value of 6 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 7 mg/L with an average of 5 mg/L. Generally, 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 indicates that marine works are not adversely affecting marine water quality outside the work site boundary in Victoria Harbour. Marine water quality at impact monitoring stations was found to be similar to that at the control stations also indicating that project marine works were generally not adversely affecting water quality in Victoria Harbour.

Table 4.6 is a summary of monitoring results from marine-based stations during mid-flood tide.

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	5.2	5.1	70.0	2.6	4.6
	max	6.3	5.9	83.1	6.9	9.4
	avg	5.8	5.5	76.1	4.5	6.4
	sd	0.4	0.2	4.1	1.5	1.7
C2	min	5.2	4.9	67.8	2.0	4.2
	max	6.4	5.9	83.4	6.1	10.0

Station		Parameter				
		DO (S&M) mg/L	DO (B) mg/L	DO % Sat. (DA)	Turbidity (DA) NTU	SS (DA) mg/L
	avg	5.7	5.4	74.6	4.3	6.2
	sd	0.4	0.3	4.6	1.3	1.8
M7	min	4.6	4.8	62.5	3.1	4.1
	max	6.1	6.1	79.5	6.3	9.1
	avg	5.4	5.3	71.4	4.5	6.0
	sd	0.4	0.4	4.3	1.1	1.4
M8	min	5.0	5.0	68.0	2.0	4.0
	max	6.3	6.2	83.1	6.6	10.1
	avg	5.7	5.7	76.5	4.5	6.2
	sd	0.4	0.4	4.7	1.3	1.8
M9	min	4.9	4.8	67.3	2.8	4
	max	6.2	6.3	81.8	6.5	10
	avg	5.5	5.4	73.0	4.7	6
	sd	0.3	0.4	4.2	1.3	2
M10	min	5.2	5.0	69.0	2.4	4.4
	max	6.4	6.5	84.5	6.2	9.8
	avg	5.7	5.6	76.2	4.3	6.2
	sd	0.4	0.4	4.7	1.3	1.4

During mid-flood tide, DO levels at marine-based impact stations (M8 & M10) in the surface to middle layer ranged from 5.0 to 6.4 mg/L with an average level of 5.7 mg/L while DO values in the bottom layer ranged between 5.0 and 6.5 mg/L with an average of 5.6 mg/L. Similar DO concentrations were recorded at the control stations in the surface to middle layer during mid-flood survey ranged between 5.2 and 6.4 mg/L with an average value of 5.7 mg/L and DO results in the bottom layer ranged from 4.9 and 5.9 mg/L with an average of 5.5 mg/L.

SS content ranged between 4 and 10 mg/L (for stations M8 & M10) with an average of 6 mg/L during mid-flood tide and ranged from 4 to 10 mg/L with an average value of 6 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 station results indicate that during the reporting month the dredging works were not adversely affecting water quality outside the work site boundary.

Seawater Intake Stations

Table 4.7 is a summary of monitoring results from seawater intake stations during mid-ebb tide.

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	4.3	59.6	4.1	6.3
	max	5.9	79.9	7.5	11.3
	avg	5.3	71.0	5.9	7.8
	sd	0.5	6.6	1.0	1.5
M2	min	4.1	56.9	4.4	7.9
	max	5.9	80.1	9.8	15.9
	avg	4.9	66.3	6.9	10.8
	sd	0.5	7.1	1.5	2.4
M3	min	4.0	54.2	3.7	6.6
	max	6.1	81.3	8.0	12.2
	avg	4.9	66.4	5.8	8.9
	sd	0.7	8.6	1.2	1.8
M4	min	4.3	59.6	3.3	5.9
	max	5.8	77.1	8.1	11.6
	avg	5.1	68.5	5.2	7.8
	sd	0.4	5.0	1.3	1.7
M5	min	4.4	59.4	3.7	5.7
	max	5.9	80.1	9.9	10.4
	avg	5.1	68.7	5.4	7.5
	sd	0.5	6.1	1.8	1.6
M6	min	4.2	57.4	3.8	5.1
	max	5.9	79.4	9.3	11.1
	avg	5.0	66.9	5.3	7.6
	sd	0.5	6.6	1.4	1.9
M11	min	4.3	60	3.8	5
	max	5.8	79	7.3	11
	avg	5.1	68	5.4	7
	sd	0.4	6	1.2	2
M12	min	4.3	57.8	3.5	5.4
	max	5.8	78.5	8.6	10.6
	avg	5.0	66.7	5.3	7.3
	sd	0.4	5.2	1.4	1.4

Seawater intake results during mid-ebb tide, **Table 4.7**, show that DO levels ranged from 4.0 to 6.1 mg/L with an average of 5.0 mg/L. SS ranged between 5 and 16 mg/L with an average value of 8 mg/L. Low DO levels at the intake stations were recorded during the reporting month but investigations found that they were not due to project works. Elevated SS levels were found on 3, 6 and 17 December 2004. These levels were investigated and it was found that they were generally due to ambient conditions and/or influences not related to project works.

Table 4.8 is a summary of monitoring results from seawater intake stations during mid-flood tide.

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	4.4	59.4	4.4	6.4
	max	6.2	83.3	10.1	13.8
	avg	5.3	70.9	6.7	8.9
	sd	0.6	7.7	1.7	1.9
M2	min	4.1	55.4	5.6	7.8
	max	5.9	80.4	11.1	18.7
	avg	4.9	66.2	7.3	11.6
	sd	0.6	7.5	1.5	3.0
M3	min	3.9	53.3	4.5	6.4
	max	6.1	81.9	7.8	11.4
	avg	5.0	66.8	5.8	9.1
	sd	0.6	8.1	0.9	1.6
M4	min	4.2	57.2	4.3	5.9
	max	5.9	79.7	8.6	11.7
	avg	5.1	69.1	5.7	8.4
	sd	0.5	7.0	1.0	1.6
M5	min	4.2	57	4.3	6
	max	5.8	80	8.6	12
	avg	5.0	69	5.7	9
	sd	0.5	7	1.0	1
M6	min	4.2	56	3.5	5
	max	5.9	80	8.3	11
	avg	5.0	68	5.1	7
	sd	0.6	7	1.2	2
M11	min	4.5	56	3.4	5
	max	5.9	79	7.8	10
	avg	5.1	67	5.4	8
	sd	0.5	7	1.4	2
M12	min	4.2	61	4.5	6
	max	5.7	80	9.4	14
	avg	5.0	69	6.8	9
	sd	0.4	7	1.4	2

During mid-flood survey, **Table 4.8** shows that DO levels at seawater intake stations ranged from 3.9 to 6.2 mg/L with an average of 5.0 mg/L. SS ranged from 5 to 19 mg/L with an average SS content of 9 mg/L. The above results show that water quality during mid-flood tide was also generally good. Again, low DO levels were found but these were found to be not due to project works. The elevated SS levels found on 1, 3 and 22 December 2004 were investigated and were found that to be due to ambient conditions and/or influences not related to project works.

However, the exceedance recorded on 17 December may have been attributed to sand filling works at IRAW. Subsequent monitoring and inspections found no further impacts from the sand filling works.

4.4.3 Waste Management

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

4.4.4 Landscape and Visual

As the major construction activities undertaken during the reporting month were related to marine 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 air quality monitoring work was undertaken during the reporting period.

5.1.2 Noise Quality

It should be noted that noise measurements are not available for the period between 3 December and 23 December 2004 as the external power source for the noise meter was disrupted due to the electrical and mechanical work carried out at City Hall.

Noise quality exceedances were recorded on 24, 26 and 31 December 2004. However, investigations into these exceedances found that they were not due to the project works. The noise levels were attributable to passer-by activities at the drop-off area in front of City Hall. There are no project works located in the vicinity of City Hall. It is also noted that external contractors are still undertaking exterior renovation works at City Hall.

5.1.3 Water Quality

Water quality was found to be generally good during the reporting month. The recorded exceedances of the water quality criteria were generally found not to be caused by the project works. Visual observations of the harbour during the reporting month noted the presence of floating debris in Victoria Harbour.

The DO levels below the Action and Limit Levels observed at the seawater intakes were investigated and were found to be attributed to natural variation or changes in ambient conditions. The exceedances were found not to be caused by the project marine works. Further, the results generally do not show any significant gradient effect between stations close to the marine works and stations more remote to the works area.

Elevated concentrations of SS were recorded on 1, 3, 6, 17 and 22 December 2004. These exceedances were investigated and all but one were found to be attributable to poor ambient conditions and/or influences not related to project works. The investigations generally found no significant gradient effects between those stations close to the project works and those more remote to the works area. However, the exceedances recorded on 17 December 2004 may have been attributed to sand filling works at IRAW. All parties were immediately informed of the exceedances and a subsequent site inspection noted that appropriate mitigation measures such as a silt curtain enclosing the works area were implemented. No further water quality impacts from sand filling works at IRAW were observed.

Silty discharges were observed at Outfall I, located adjacent to HSBC's seawater intake, on 15 and 16 December 2004. Investigations into these exceedances found that the discharges are not project related, as no muddy works are located in the area. Information regarding the discharges has been provided to EPD for their record and necessary actions.

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 summary of the findings from the site inspections conducted during the reporting month is provided in **Table 5.1**.

Table 5.1 - Summary of Environmental Site Inspections

Date of Inspection	Observations	Action(s)
3 December 2004	The chemical waste absorption pack was found missing at the chemical waste storage location at CR-4.	The Contractor advised that the absorption pack is located at CR-13 and will return it to the chemical waste storage area
	Dark smoke was found emitting from one large excavator at CR-12.	The Contractor agreed to undertake necessary maintenance or repairs for the equipment.
9 December 2004		
16 December 2004	A leaky hose connection from the sedimentation tank at CR-4 was observed	The Contractor was asked to make the necessary repairs.
	A small amount of fugitive dust was observed at the cement mixing area at CR-4	The Contractor was asked to improve the dust covering at the mixing area.
	Floating debris was found along the seawall near IRAW	The Contractor was asked to clear the floating debris.
	Silty discharges were observed at Outfall I, which is located adjacent to the HSBC seawater intake. Resident site staff observed similar discharges on 15 December 2004. An investigation into the incident found that the discharges are not project related, as no muddy works are located in the area.	No actions are required as discharges are not project related.
23 December 2004	Two used batteries were found discarded beside a generator at CR-12.	The Contractor was asked to transfer the used batteries to the chemical waste storage area.
	It is noted that the dust screens at the cement mixing area at CR-4 have been improved since the last site inspection.	No further actions required.
	Damaged sand bags were found placed around a drainage catch basin at CR-10.	The Contractor was asked to replace the damaged sand bags.
30 December 2004	Soil stockpiles at CR-12 were found to be uncovered.	The Contractor was reminded that soil stockpiles should be covered with impervious sheeting when they are not in use.
	Oil stained soil was found underneath one power generator at CR-4	The Contractor is reminded to properly maintain all plant and equipment and to use care during the transferring of lubricating oil.
	The damaged sand bags previously found at CR-10 have been replaced.	No further actions required.
	The discarded batteries previously found at CR-12 have been properly transferred to the chemical waste storage area.	No further actions required.

No significant sediment plumes were observed near the marine works during the site inspections.

5.2 Environmental Complaint and Prosecution

No environmental complaints and no prosecution notices or summons were received during the reporting month.

5.3 Environmental Enquiries

No environmental enquiries were received during the reporting month.

6. FORECAST AND SCHEDULE

6.1 Key Works for the Coming Month

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

- In-situ work for the pumping stations installed at IRAW;
- Piling works at Pier No. 8 and concreting of piles and pile caps;
- Removal of piling obstructions at Public Pier West and piling works;
- Site investigation for and the installation of pre-bored H-piles for the CTB piling works, as well as substructure / superstructure works;
- Architectural works for Pier No. 7;
- Vibro-compaction to sand fill at IRAW;
- Rock filling and sand filling works at IRAE;
- Installation of pre-cast caissons at IRAE;
- Bored-pile foundations for the Eastern Seawall;
- Temporary intake pipes installation;
- Land piling work for the Man Yiu Street Footbridge;
- Concrete repair works to Existing Culvert F;
- Cooling water mains work; and
- Maintenance and necessary repair works for seawater intake silt screens.

6.2 Monitoring Schedules for the Coming Months

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 significant 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 upcoming months is provided in the following table.

Table 6.1 - Water Quality Monitoring Programme

Date of Sampling	Sampling Time	
3 January 2005	12:00	17:00
5 January 2005	08:30	13:29
7 January 2005	09:30	14:45
10 January 2005	12:00	17:00
12 January 2005	08:45	13:57
14 January 2005	10:08	15:34
17 January 2005	12:00	17:00
19 January 2005	08:30	13:30
21 January 2005	10:26	17:30
24 January 2005	11:52	16:41
26 January 2005	08:30	13:30
28 January 2005	08:49	14:05
31 January 2005	10:19	16:09
2 February 2005	11:28	17:00
4 February 2005	08:30	13:30
7 February 2005	11:27	16:13
14 February 2005	10:16	16:31
16 February 2005	11:31	18:57
18 February 2005	09:08	17:30
21 February 2005	11:14	15:53
23 February 2005	12:00	17:00
25 February 2005	08:30	13:30
28 February 2005	08:52	14:53

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, exceedances of the water quality criteria occurred and most were found not to be caused by the project works. The ambient water quality throughout Hong Kong waters was found to be relatively good for most of December 2004. However, low DO levels and relatively high SS concentrations recorded at the seawater intake stations on several occasions. Visual observations of the harbour during the reporting month noted the presence of floating debris, which did not originate from the project.

Low DO levels were recorded at seawater intake stations, but investigations into these exceedances found that the low levels were not due to project works as no significant gradient effect was observed between stations located close to the works and stations located more remote to the works. Near-shore influences not related to project works might have affected DO concentrations at the seawater intake stations.

Elevated SS levels were recorded on five occasions during the month of December 2004. Investigations into these exceedances found that they were mainly attributed to ambient conditions and/or influences not related to project works. The results generally did not show any significant gradient effects between stations located near the works and stations located farther away from the works. However, the exceedances recorded on 17 December 2004 may have been attributed to sand filling works at IRAW. All parties were immediately informed of the exceedances and a subsequent site inspection noted that appropriate mitigation measures were implemented at the works. No further water quality impacts from sand filling works at IRAW were observed.

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.