

**Central Reclamation, Phase III  
Quarterly EM&A Report No. 10  
(November 2005 through January 2006)**







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ACL	Atkins China Limited
CEDD	Civil Engineering and Development Department
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**

Atkins China Limited (ACL) has been appointed by TDD (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) 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 services during the duration of the construction works.

This is the tenth quarterly EM&A Report 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 program during the reporting period from 1 November 2005 to 31 January 2006.

### ***Environmental Monitoring and Audit Progress***

Air, Noise and water quality monitoring were conducted during this quarter. Weekly environmental site inspections were also conducted during the reporting quarter.

### ***Exceedances of Action and Limit Levels***

One air quality exceedance of the Action Limit (AL) for 1 hr TSP was recorded during the reporting period (December 2005). It was concluded that while works at CRIII may contribute in some way to the elevated levels observed, regional air quality was by far the biggest factor in the exceedance of the AL.

Continuous noise monitoring was carried out during the reporting period and noise exceedances were recorded in November 2005 (Total 1 Day), December 2005 (Total 1) and January 2006 (Total 12). The exceedances were found not to be attributed to the project works but rather to be a combination of the Hong Kong Electric's Contractors laying a below ground cable directly in front of City Hall (November and December), the façade renovation works at City Hall (November 2005 to Mid January 2006), general peak bus and taxi traffic drop off flows in front of City Hall and Lunar New Year seasonal activities in January 2006.

Reduced DO levels were recorded in November 2005 along the seawall, the majority of the stations showing levels below the AL with only one exceedance of the Limit Level (LL). In December 2005 water quality along the seawall for the first part of the month was similar to that of November, showing several exceedances of the AL, however, as the month progressed overall DO concentrations increased. In January 2006, only one exceedance of the AL was recorded with most DO concentrations well above the AL.

While overall average concentrations of SS had reduced from the previous quarter, several exceedances of the AL and LL at the seawall stations were recorded for the reporting period. During November, SS levels exceeded the AL on 6 days and the LL on 2 days. During December 2005 SS was very low, with no exceedances being recorded. The general low concentration of SS was maintained in January 2006 although there were 3 days where SS concentrations spiked above the LL.

For both DO and SS these exceedances were not found to be attributable to the project works but rather natural variation in water quality across the site and beyond.

Precautionary mitigation measures implemented during the quarter included increased frequency of haul road water bowing as a consequence of the dry season, coverage of

stock piles, bunding of bore piling operations and installation of additional silt curtains in culvert J to prevent migration of silty water into Victoria Harbour.

### ***Complaint Log***

In December 2005, two noise complains were received one from a member of the public and one from the Management office for IFC both regarding construction noise along Man Yiu Street.

### ***Notifications of Summons and Prosecutions***

There were no notifications of summons or prosecutions received during this reporting quarter.

### ***Site Inspection and Audit***

Weekly environmental site inspections were carried out during this quarter. Any minor deficiencies noted during the site inspections were rectified by the Contractor upon receipt of notification.



## **1. INTRODUCTION**

### **1.1 Basic Project Information**

The Territory Development Department (TDD) (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 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 28 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. The main construction works that were identified in the EIA Report for the Project, requiring environmental monitoring and audit, have commenced.

The Contractor's works programme for the quarter is provided in **Annex E**.

### **1.2 Project Organisation and Management Structure**

Atkins China Limited (ACL) has been commissioned by TDD (now called CEDD), the employer, to undertake the environmental monitoring and audit work for the project. ACL is also the Resident Engineers for the project and LCSVO-JV is the main contractor. An Independent Environmental Checker (IEC) has been employed to audit the EM&A programme. The contacts of key management are provided in **Annex A**.

### **1.3 Works Undertaken**

The works undertaken in the project area requiring environmental monitoring and audit as identified in the EIA Report (not including Chai Wan Basin) during the quarter included:

- Architectural works for Pier 7;
- Pier 8; lower, middle and upper deck construction plus Architectural works;
- Piling work and concreting works at Public Pier West;
- Central Terminal Building (CTB) superstructure and sub-structure works including link bridge plus Architectural works;
- MYS footbridge pile cap, column construction and cross head construction;
- MYS storm drainage, sewers, watermains and roadworks to pier areas;
- MYS Laying of 800 dia. Cooling Main;
- MYS Existing Culvert F – preparation for desilting and stabilisation works for culvert and U-Trap structure
- MYS Culvert F Extension – preparation for piling for Bay 1;

- Sand filling and rock filling works at IRAE;
- Temporary seawall construction at IRAE;
- In-situ work to caisson and pumping stations at IRAE;
- Temporary diversion of Culvert J, SI works and piling;
- Deep compaction works on IRAE;
- Eastern Seawall bored piling;
- ESB (S8.1 & S9.1) – structural works;
- ESB (S11.1 & S11.2) – ABWF and E&M works;
- Maintenance and necessary repair works for seawater intake silt screens.
- Cooling water main construction;

**2. EM&A REQUIREMENTS**

**2.1 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 2-1**.

**Table 2.1 - Summary of Impact EM&A Requirements**

<b>Parameters</b>	<b>Descriptions</b>	<b>Locations</b>	<b>Frequencies</b>	<b>Duration</b>
<i>TSP</i>	<i>24-Hour TSP</i>	<i>2 Locations</i>	<i>Once every 6 days</i>	<i>During dust generating construction works</i>
	<i>1-Hour TSP</i>	<i>2 Locations</i>	<i>Three times in every 6 days</i>	<i>During dust generating construction works</i>
<i>Noise</i>	<i>Leq (30 mins), L<sub>10</sub>, L<sub>90</sub></i>	<i>1 Location</i>	<i>Continuous measurements</i>	<i>Two weeks before Construction and During Construction</i>
<i>Water Quality</i>	<i>Dissolved Oxygen; Salinity; Temp; Suspended Solids; Turbidity.</i>	<i>14 Locations</i>	<i>3 times a week, Mid-ebb/flood tides</i>	<i>During Marine Works and for 4 weeks after completion of Marine Works</i>
<i>Waste</i>	<i>On-Site Waste Audit</i>	<i>Active Work Sites</i>	<i>Periodically</i>	<i>During Construction</i>
	<i>On-Site Waste Inspection</i>			
<i>Landscape and Visual</i>	<i>Audits to ensure effective implementation of mitigation measures</i>			<i>During Construction</i>
<i>General Site Conditions</i>	<i>Environmental Site Inspection</i>	<i>Works areas and areas affected by works</i>	<i>Periodically</i>	<i>During Construction</i>

## **2.2 Environmental Quality Performance Limits**

Environmental Quality Performance Limits for air, noise and water quality have been established as part of the Baseline Monitoring Report and are provided in **Annex B**.

## **2.3 Event Action Plan**

Event Action Plans for air, noise and water quality have been developed as part of the Baseline Monitoring Report and are provided in **Annex C**.

### **3. ENVIRONMENTAL STATUS**

#### **3.1 Implementation of Environmental Measures**

The Contractor has implemented relevant mitigation measures listed in the EIA Report, EM&A Manual and Further Environmental Permit. Seawater intake silt screens have been installed prior to the start of the dredging works and a silt curtain attached to a floating steel frame is installed around the grab dredger when used.

#### **3.2 Environmental Monitoring Locations**

Drawings showing the project area and locations of the monitoring stations are provided in **Annex D**.

#### **3.3 Air Quality Monitoring Results**

Air quality monitoring commenced on 21 April 2005 at Central Barrack. Monitoring was not conducted at the City Hall monitoring station because exterior renovation works were undertaken by City Hall at the elevated walkway area. Air quality monitoring at the City Hall monitoring station will commence in February 2006. The graphical plot of air quality monitoring results is provided in **Annex F**.

#### **3.4 Noise Quality Monitoring Results**

The noise meter and microphone assembly was sent for inspection and repair at the end of December 2006 due to intermittent meter failures. In the previous quarter, the SLM had failed three times. A calibrated and certified SLM was installed as a temporary replacement (Rion NL-31 Serial No. 0032053, Calibration Certificate No. C054441-Dated 17 October 2005).

The graphical plot of noise monitoring results for this quarter is provided in **Annex G**.

#### **3.5 Water Quality Monitoring Results**

The graphical plot of water quality monitoring results for this quarter is provided in **Annex H**.

#### **3.6 Solid and Liquid Waste Management Status**

Solid and liquid waste management was implemented according to the Waste Management Plan during the reporting quarter.

#### **3.7 Landscape and Visual Audit**

As the works undertaken during the reporting quarter were mainly related to reclamation, buildings and infrastructure works, the landscape and visual impacts are considered to be minimal.

## **4. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

### **4.1 Environmental Exceedances**

There was one exceedance of air quality during the reporting quarter, this was not attributed to project works.

Noise exceedances were recorded on the 10 November 2005, 17 December 2006, 4, 5, 6, 7, 9, 17, 18, 20, 22, 29, 30 and 31 January 2006 at City Hall. The exceedances at City Hall were not attributed to CRIII project works as no major works was being carried out in the area but more from a combination of noise sources including façade restoration works at City Hall, peak busy period traffic movements, Lunar New Year seasonal activities and other periodic sources.

Elevated levels of DO and SS were found during the reporting period, particularly at the seawater intake stations along the coast.

#### Dissolved Oxygen

On 1 November 2005, exceedances of the AL were recorded at stations M1 to M6, M8, M11 to M12 during the mid-ebb tide and M1 to M6, M8, M10, M11 to M12 during the mid-flood tides.

On 3 November 2005, exceedances of the AL were recorded at stations M1 to M4A, M11 to M12 during the mid-ebb tide and M1 to M6, M10, M11 to M12 during the mid-flood tides.

On 5 November 2005, exceedances of the AL were recorded at stations M1 to M6, M12 during the mid-ebb tide and M1 to M6, M11 to M12 during the mid-flood tides.

On 9 November 2005, exceedances of the AL were recorded at stations M1 to M6, M11 to M12 and the LL at M4A during the mid-ebb tide and M1 to M6, M10, M11 to M12 during the mid-flood tides.

On 11 November 2005, exceedances of the AL were recorded at stations M1 to M6, M8, M10 and M11 to M12 and during the mid-ebb tide and M1 to M6, M8, M10, M11 to M12 during the mid-flood tides.

On 14 November 2005, exceedances of the AL were recorded at stations M2 to M6, M12 and during the mid-ebb tide and M1 to M6, M10, M11 to M12 during the mid-flood tides.

On 16 November 2005, exceedances of the AL were recorded at stations M1 and M2 during the mid-ebb tide and M1 to M6, M11 to M12 during the mid-flood tides.

On 18 November 2005, exceedances of the AL were recorded at stations M1 to M6 and M12 during the mid-ebb tide and M2 to M6, M11 and M12 during the mid-flood tides.

On 21 November 2005, exceedances of the AL were recorded at stations M10, M2, M4A to M6 and M11 to M12 during the mid-ebb tide and M4A during the mid-flood tides.

On 23 November 2005, exceedances of the AL were recorded at stations M2, M4A to M6 and M12 during the mid-ebb tide and M2 to M4A, M6 and M12 during the mid-flood tides.

On 23 November 2005, exceedance of the AL was recorded at station M12 during mid-ebb tide.

On 28 November 2005, exceedances of the AL were recorded at stations M1 to M6, M8, M10, M11 and M12 and M1 to M6, M8, M11 and M12 during the mid-ebb tide and M2 to M4A, M6 and M12 during the mid-flood tides.

On 30 November 2005, exceedances of the AL were recorded at stations M1 to M6, M11 and M12 during the mid-ebb tide and M1 to M6, M8, M11 and M12 during the mid-flood tides.

On 2 December 2005, exceedances of the AL were recorded at stations M3, M5, M10 and M12 during the mid-ebb tide and M1 to M4A, M8 and M10 during the mid-flood tides.

On 5 December 2005, exceedances of the AL were recorded at stations M1 to M6, M11 and M12 during the mid-ebb tide and mid-flood tides.

On 7 December 2005, exceedances of the AL were recorded at stations M2 to M6, and M11 during the mid-ebb tide and M2 to M6, and M12 during the mid-flood tides.

On 12 December 2005, exceedances of the AL were recorded at stations M3 during the mid-ebb tide and M4A during the mid-flood tides.

On 14 December 2005, exceedances of the AL were recorded at stations M1 during the mid-flood tide.

On 5 January 2006, exceedances of the AL were recorded at stations M6 on the mid-ebb tide.

#### Suspended Solids

On 7 November 2005, exceedances of the AL at M5 and M6, LL at M3 & M4A during the ebb-tide were observed.

On 16 November 2005, exceedances of the AL at M4A during the flood-tide were observed.

On 21 November 2005, exceedance of the AL was recorded at station M11 during mid-ebb tide.

On 23 November 2005, exceedance of the AL was recorded at station M12 during mid-ebb tide.

On 25 November 2005, exceedance of the AL was recorded at station M3 and the limit level at M4A during mid-ebb tide.

On 28 November 2005, exceedance of the AL was recorded at station M2 during mid-flood tide.

On 5 January 2006, exceedances of the LL were recorded at stations M3 on the mid-flood tide.

On 16 January 2006, exceedances of the LL were recorded at stations M5 on the mid-flood tide.

On 25 January 2006, exceedances of the LL were recorded at stations M4A on the mid-ebb tide.

None of the observed WQ exceedances were found to be directly attributed to site works, as most of the major marine dredging and reclamation works for IRAE and IRAW have been completed, the remaining marine works undertaken during the period such as diversion works for culvert J and bore piling for the eastern seawall of FRAE did not result in significant disturbance to the seabed or creation of excessive suspended solids in Victoria Harbour.

A statistical analysis (**Annex I**) of the suspended solids monitoring results found that the quarterly mean is significantly less than 1.3 times of the ambient mean recorded during the baseline period. This indicates that the Project construction works generally did not cause adverse impacts during the reporting period with respect to the baseline condition.

#### **4.2 Non Compliance**

No environmental no-compliances were reported in the quarter.

#### **4.3 Summary of Actions Taken by the Contractor**

The Contractor has implemented the following measures to prevent air, and water impacts:

- General maintenance of bunds, drainage channels, catch-pits and wheel wash bays;
- Provision of rock and sand bunds along culvert J, IRAE;
- Provision of further catch pits to collect spill over from wheel washing facilities; increased frequency of cleaning of catch-pits;
- Drivers instructed to wash down truck wheels and undercarriage before leaving site;
- Water bowing of haul roads and other areas of the site. Covering of stock piles.

#### **4.4 Environmental Enquiries**

No environmental enquiries were received during the reporting quarter.

#### **4.5 Environmental Complaints and Prosecutions**

A complaint was received by CEDD on the 12 of December 2005 from a member of the public regarding noise generated from works along Man Yiu Street. The Complaint was passed on to the ER and the ET for investigation.

In addition to the 24 hr noise monitoring carried out at City Hall by the ET, the ER also carry out ad-hoc noise monitoring twice a month on the IFC Podium (opposite Man Yiu St). Data from the IFC Podium indicate that Leq (30 min) dB(A) has remained below 70 dB(A) over the last 6 months.

The Environmental Monitoring and Audit (EM&A) Manual for CRIII sets out various noise control mitigation measures including the use of quiet plant and mufflers. These were installed on the excavation breaker so as to reduce further the nuisance to the public.

A response was issued by CEDD on the 18 of December 2005.

A complaint was received by CEDD on the 17 of December 2005 from the management office of IFC regarding noise generated from works along Man Yiu Street. The Complaint was passed on to the ER and the ET to investigate.

As discussed above, the ER carries out regular noise monitoring on the IFC Podium. In response to the complaint, the ET and ER carried out further noise monitoring during the

noisiest activities at Man Yiu Street, daily 30 minute sheet piling works, and found that levels reached 72 Leq (30 min) dB(A).

The Environmental Monitoring and Audit (EM&A) Manual for CRIII sets out various noise control mitigation measures including the use of quiet plant and mufflers. Mufflers were installed on the excavation breaker so as to reduce further the nuisance to the office works.

As the IFC is a place of work relying on closed windows and due to the daily short period of sheet piling activity, the noise level threat at IFC should be lower than the 72 Leq (30 min) dB(A) measured on the Podium.

A response to the IFC Management Office was issued by CEDD on the 28 of December 2005.

#### **4.6 Record of Environmental Complaints and Summons & Prosecutions**

The following table summarises all the complaints attributable to project works received (both written and verbal) and the liaison/consultation undertaken, and the actions and follow-up procedures taken.

**Table 4.1 - Summary of Complaints Received**

<b>Month/ Date of Complaint</b>	<b>Media</b>	<b>Complaint &amp; Action</b>	<b>Liaison/ Consultation Taken</b>	<b>Follow-up Action</b>
December 2005	Noise	Member of public submitted a complaint regarding construction noise along Man Yiu Street. Mufflers installed on construction equipment to further reduce disturbance to public. CEDD issued a response letter on the 18 December 2005.	CEDD, Contractor,, ER, IEC, ET	ER will continue to carry out twice monthly noise monitoring from the IFC podium
December 2005	Noise	IFC Management Office submitted a complaint regarding construction noise along Man Yiu Street. ER initiated on spot noise measurement at IFC podium during the nosiest activity – sheet piling. Results show that levels were within acceptable limits. Mitigation as above. CEDD issued a response letter on the 28 December 2005.	CEDD, Contractor,, ER, IEC, ET	ER will continue to carry out twice monthly noise monitoring from the IFC podium.

There were no notifications of summons and prosecutions during the reporting quarter.

## **5. CONCLUSION**

During environmental site inspections conducted during the reporting quarter, no non-compliances were noted.

No prosecutions were received during the reporting quarter.

Generally air quality measurements were within the AL for TSP indicating that the project was not having an adverse impact on local air quality. In December, one exceedance of the AL for dust (1-hr TSP) recorded at the PLA Central Barracks air quality monitoring station. It was concluded that while works at CRIII may contribute in some way to the elevated level observed, regional air quality was by far the biggest factor in the exceedance of the AL.

Noise exceedances were recorded during the reporting quarter, these exceedances were attributed to a combination of the Hong Kong Electric's Contractors laying a below ground cable directly in front of City Hall (November and December), the façade renovation works at City Hall (less than 4m from the external microphone), general peak bus and taxi traffic drop off flows in front of City Hall and seasonal activities in January 2006.

Overall water quality improved as the quarter progress with DO levels increasing and SS levels decreasing. Water quality within the project area was found to be generally good at the marine stations during the reporting period. There were occasional exceedances of the AL and LL for DO and SS along the seawall intake stations throughout the quarter but these were not directly attributed to project works rather more reflective of general water quality conditions along the seawall.



***Annex A***

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***Project Organisation /  
Contact Information***



***Annex B***

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



## ***Annex C***

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# ***Event Action Plans for Air, Noise and Water Quality***



***Annex D***

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***Monitoring Stations Locations***



***Annex E***

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***Contractor's Work Programme***



***Annex F***

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***Graphical Representation of  
Air Quality Monitoring Results***



## ***Annex G***

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# ***Graphical Representation of Noise Quality Monitoring Results***



***Annex H***

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



***Annex I***

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***Quarterly Assessment of Construction  
Impacts on Suspended Solids***