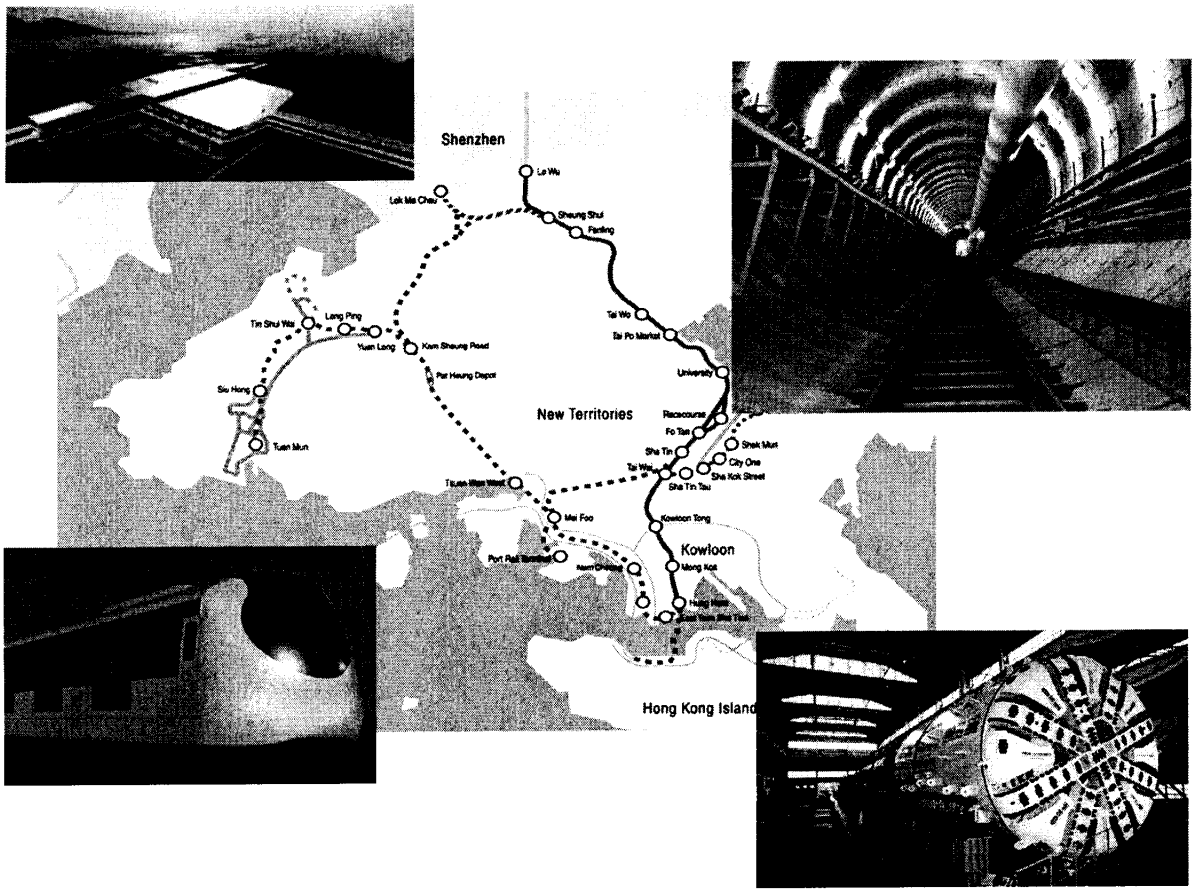
Dragages (HK) Joint Venture
法國寶嘉（香港）聯營

KCR
九廣鐵路
東鐵支線
East Rail Extensions

Contract No. LDB201
Sheung Shui to Chau Tau Tunnels

Project Environmental Monitoring and Audit
Quarterly Report – July 2003 to September 2003

LDB201/00/ENV/841/A



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EXECUTIVE SUMMARY

Before the commencement of works under the East Rail Extension Contract LDB201, Dragages (HK) Joint Venture set an environmental monitoring and audit (EM&A) programme for the construction works. The aim of the programme is to ensure that all the on-site activities should comply with the statutory guidelines and legislations. This quarterly report summarized the findings in the period from 1 July 2003 to 30 September 2003.

The construction works of LDB201 commenced from late November 2002 and this is the second quarter report. During this quarter, the main construction activities of each Works Area were summarized as follows:

- Sheung Shui Area (include San Wan Road and East Rail Area) – Shoring for pump station, watermain and drainage diversion, erection of hoardings, installation of movable protective frame rail, and platform trimming of Sheung Shui KCRC Station;
- TBM Works Area – Site installation, TBM Main Drive refurbishment, conveyor and shaft roof installation, MS plant and motor plant installation, and Tunnel boring and lining;
- East EAP Area – Diaphragm wall construction, site installation and testing;
- Kwu Tung Area – Site formation works, hoarding erection, erection of noise barriers along site boundary, DSD open channel diversion, construction of access road, guide wall and diaphragm wall construction, and shaft excavation and strut installation;
- West EAP Area – Retaining wall construction, Site installation, pre-drilling formation works and, tree felling and clearance;
- Cross Passages Area – Site installation; and
- West Approach Area – Site clearance and installation, build up platform for sheet piles and diaphragm walls, driven sheet piles and backfilling fish ponds.

During the weekly site inspections, all the Works Areas were generally in compliance with the site audit checklist, however improvement was required at the specific items during each inspection.

In this reporting quarter, no exceedance of Action or Limit Level for noise and air quality was recorded within this reporting period. However close monitoring is paid on each works areas in order to keep the site in good condition all the times.

For the water quality, one dissolved oxygen (DO) and one pH exceedance in total at the monitoring station RS1 were found; two turbidity, six pH and three suspended solids (SS) exceedances were recorded at the monitoring station RB1; and there were nine pH, one DO and two turbidities were logged at monitoring station CTC1 in this reporting quarter.

Excess excavated materials and spoils generated in this reporting quarter were disposed of by dump trucks to Kai Tak Public Filling Barging Point (KTPF). Construction and Demolition (C&D) waste was delivered to North East New Territories Landfill Site and the waste generated from site clearance and demolition was sent to Tuen Mun Public Filling Site (Area 38) in this reporting quarter.

In order to make maximum use of suitable materials available rather than go to the public fill, certain amount of excess excavated spoils were gone to the approved alternative sites for reuse. They included:

- EPD's Project of Development, Management of NENT Landfill (Contract No. EP/SP/12/92);

- DSD Contract DC/2001/09 – San Tin Eastern Main Drainage Channel;
- Another ERE Contract LCC202 – West Section Alignment and Associated Works, and
- Internal use between Works Areas under our contract for backfilling.

Two public complaints were received in this reporting quarter. The first one was received on 21 July 2003, while the second one was transferred from another KCRC ERE Contract LCC300. The complaint was received on 22 September 2003. Besides, two EPD warnings (yellow notice) were obtained from their visit on 28 July 2003 and 15 September 2003 respectively in this reporting quarter.

As per construction activities scheduled for the coming quarter, it is recommended that the appropriate mitigation measures which set out in the Environmental Management Plan (EMP) [Doc. No. LDB201/00/ENV/801] should be continual implemented on site.

1. INTRODUCTION

1.1 Background

1.1.1 Kowloon Canton Railway Corporation (KCRC) proposed a Spur Line (from Sheung Shui to Lok Ma Chau) to alleviate the over-crowding conditions at Lo Wu on peak days and provide an alternative entry point to Shenzhen. Dragages (HK) Joint Venture (DJV) has been awarded a contract (Contract No. LDB 201) of Spur Line for the construction of tunnels between Sheung Shui to Chau Tau. Under this contract, two parallel 5.2km tunnels (1.7km of cut and cover, and 3.5km of tunnel boring machine (TBM)) would be constructed. A number of Works Areas would be located along the alignment and showed in Figure 1.1.

1.2 Purpose of this Quarterly EM&A Summary Report

1.2.1 This report reviews the progress of the environmental monitoring and audit works at all Works Areas under the East Rail Extension Contract No. LDB 201 – Sheung Shui to Chau Tau Tunnels for the second quarter from July 2003 to September 2003.

1.3 Project Environmental Organization and Programme

1.3.1 Under the requirement of EM&A Manual, Environmental Permit and the Further Environmental Permit, Contractor's Environmental Team was set up, comprising an Environmental Manager, Environmental Team Leader (ETL), Environmental Engineer and the Environmental Monitoring Team. The project environmental organization chart is shown in Figure 1.2. Meanwhile the contacts of key management for this captioned project are shown in Table 1.1.

Table 1.1 Contacts of Key Management

Company	Contact Person	Position	Telephone No.
KCRC/Environmental	Simeon Cheng	Senior Env. Specialist	2684 8532
KCRC/RSS	Monte Cheung	ERep (Env.)	3476 0812
Dragages (HK) Joint Venture	Jon Eggington	Env. Manager	3476 0310
	Schroeder Tam	Env. Team Leader	3476 0315
Hyder Consulting Ltd	Dr. Gui-yi Li	Independent Env. Checker	2911 2233
Furgo Technical Services Ltd – MateriaLab Division	John Ho	Env. Monitoring Team Supervisor	2452 7136
Environmental Protection Department	Eddie Lui	Senior EPO	2411 9602

1.4 Project Construction Programme and Works in the reporting quarter

1.4.1 The construction programme commenced in late November 2002 and is anticipated to be completed in mid June 2006. The construction programme would be attached in Figure 1.3.

1.4.2 The progress (synopsis of works) in the third reporting quarter including the following activities:

- Sheung Shui Area (include San Wan Road and East Rail Area) – Shoring for pump station, watermain and drainage diversion, erection of hoardings, installation of movable protective frame rail, and platform trimming of Sheung Shui KCRC Station;
- TBM Works Area – Site installation, TBM Main Drive refurbishment, conveyor and shaft roof installation, MS plant and motor plant installation, and Tunnel boring and lining;
- East EAP Area – Diaphragm wall construction, site installation and testing;
- Kwu Tung Area – Site formation works, hoarding erection, erection of noise barriers along site boundary, DSD open channel diversion, construction of access road, guide wall and diaphragm wall construction, and shaft excavation and strut installation;
- West EAP Area – Retaining wall construction, Site installation, pre-drilling formation works and, tree felling and clearance;
- Cross Passages Area – Site installation; and
- West Approach Area – Site clearance and installation, build up platform for sheet piles and diaphragm walls, driven sheet piles and backfilling fish ponds.

1.5 Structure of the Quarterly EM&A Summary Report

1.5.1 Following the introductory section, this report is set out as follows:

- Section 2 gives a brief summary of the EM&A requirements;
- Section 3 summarized the noncompliance and their follow-up actions;
- Section 4 reported the status of the waste management;
- Section 5 concluded the complaints, summons and prosecutions received in the reporting period; and
- Section 6 presented the comments and conclusions.
- Appendix A obtained the monitoring results during the reporting quarter in graphical format.
- Appendix B provided the Event and Action Plan for Noise, Air Quality and Water Quality.
- Appendix C reviewed the updated environmental mitigation and implementation schedule (EMIS).

2. SUMMARY OF ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REQUIREMENTS

2.1 Monitoring Parameters

2.1.1 In accordance with the EM&A requirements, impact monitoring for air quality, noise and water quality should be undertaken at designated monitoring stations during the construction phase. The impact monitoring was started on early December 2002 and is on going currently. The monitored parameters are summarized in Table 2.1

Table 2.1 Summary of Monitored Parameters

Parameter	Monitored Item	No. of Monitoring Station	Frequency
Air Quality	Total Suspended Particulates (TSP) 1 no. of 24-hour sample; and 3 no. of 1-hour samples	 2 3	Once every six days
Noise	Noise level of Leq (30 mins) 6 consecutive no. of Leq (5-min) between 0700 and 1900 hours during the normal weekdays	12	Once per week
Water Quality	In-situ measurements: • Dissolved Oxygen (DO) • pH • Water Temperature • Turbidity	6	Twice per week
	Laboratory Analysis: • Suspended Solids (SS) • Oil and Grease	6	Once per week Biweekly

2.2 Action and Limit Levels

2.2.1 The Action and Limit Levels are established based on the data from the Baseline Report (Issue 00), which was issued in August 2002. The monitoring results should be audited for the compliance of the Action and Limit Levels for noise, air quality and water quality. The Action and Limit Levels for each parameter are summarized in Tables 2.2 to 2.4. Should the monitoring results indicate any noncompliance of Action and Limit Levels, action according to the Event and Action Plan in Appendix B should be followed and appropriate mitigation measures should be implemented to rectify the situation.

2.2.2 The Action and Limit Noise Levels are based on the number of independently documented complaints received during the construction in weekly basis and the specific noise limits, if applicable.

Table 2.2 Action and Limit Levels of Daytime, Evening and Night-time Noise Monitoring

Time Period	Action Level	Limit Level (Leq (30-min)), dB(A)
0700-1900 hrs on normal weekdays	On receipt of more than one independently documented complaints about construction noise in a one week period.	75*dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days		60/65/70**dB(A)
2300-0700 hrs of next day		45/50/55**dB(A)

*: *Reduce to 70 dB(A) for schools and65 dB(A) during school examination periods*
**: *To be selected based on Area Sensitive Rating.*

2.2.3 The Action and Limit Levels for Total Suspended Particulates (TSP) are formulated based on the pooled baseline monitoring data at the selected monitoring stations.

Table 2.3 Action and Limit Levels for 1-hour Average TSP and 24-hour TSP Monitoring

Monitoring Location	1-Hr TSP Concentration, $\mu g/m^3$		24-Hr TSP Concentration, $\mu g/m^3$	
	Action Level	Limit Level	Action Level	Limit Level
AM1	382	500	181	260
AM2	354	500	149	260

2.2.4 The Action and Limit Levels for water quality monitoring are derived from the baseline monitoring data at the selected monitoring stations.

Table 2.4 Action and Limit Levels for Water Quality Monitoring

Parameter, Unit		Water Quality Monitoring Stations		
		Mid-Ebb Tide		
		RS1	RB1	CTC1
DO, mg/L	Action	1.63	2.16	4.41
	Limit	1.61	1.97	4.35
Turbidity, NTU	Action	115.0	79.0	25.2
		or 120% of upstream control station's Turbidity at the same tide of the same day		
	Limit	115.4	110.6	29.2
		or 130% of upstream control station's Turbidity at the same tide of the same day		
pH	Action	<6.8 or >7.7	<6.7 or >7.7	<7.5 or >8.9
	Limit	<6.0 or >10.0	<6.0 or >10.0	<6.0 or >10.0
Total Suspended Solid (TSS), mg/L	Action	129.3	60.3	73.4
		or 120% of upstream control station's TSS at the same tide of the same day		
	Limit	161.9	62.5	92.3
		or 130% of upstream control station's TSS at the same tide of the same day		
Oil & grease, mg/L	Limit	17.8	10.5	32.0
Upstream Control Station		URS	URB	UCTC

Notes:

- *For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the Action/Limit Levels.*
- *For Turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the Action/Limit Levels.*
- *For pH, non-compliance of the water quality limits occurs when results is outside the range of Action/Limit Levels.*
- *The Limit Level for Oil & grease is the average value of the baseline monitoring results.*

2.3 Monitoring Stations

2.3.1 In the third reporting quarter, twelve noise monitoring stations, three air quality monitoring stations (two stations for 24-hr TSP and three stations for 1-hr TSP) and six water quality monitoring stations (two at River Sutlej, two at River Beas and two at Chau Tau Channel) were selected to carry out the monitoring. The detailed locations of the monitoring stations are presented in Tables 2.5 to 2.7 and Figure 1.1.

Table 2.5 Construction Noise Monitoring Locations

Station ID	Equivalent NSRs in EIA	Description
NM1	1	Moon Wah Building, Sheung Shui
NM2	3	Choi Ying House, Sheung Shui
NM3	4	Village house, Tsung Pak Long (near the River Sutlej)
NM4	5	Village house, Long Valley (near the River Beas)
NM5	8	Village house, Kwu Tung
NM6	9	Sheung Shui Pui Yau Kindergarden, Kwu Tung
NM7	11	Kwu Tung Public Oi Wai School, Kwu Tung
NM8	14	Village House, Kwu Tung
NM9	16	Village, Pak Shek Au
NM10	18	Village House, Chau Tau
NM11	19	Village House, Chau Tau
NM12 *	-	Village House, Chau Tau

Notes: * *denotes the noise monitoring station was relocated due to the refusal of the owner of the original one.*

Table 2.6 1-hr / 24 hr Dust Monitoring Locations

Station ID	Equivalent ASRs in EIA	Description
AM1	4	In front of Village House in Tsung Pak Lung
AM2	14	In front of Village House in Kwu Tung
AM3 #	-	In front of Village House in Chau Tau

Notes: # *denotes the 1-hr TSP was conducted at this station since the proposal is still under review by EPD.*

Table 2.7 Monitoring Locations for Water Quality

Station ID	Description
URS	River Sutlej – upstream of the River
RS1	River Sutlej – downstream of the River
URB	River Beas – upstream of the River
RB1	River Beas – downstream of the River
UCTC	Chau Tau Channel – upstream of the channel
CTC1	Chau Tau Channel – downstream of the channel

Notes: URS, URB and UCTC are used as the control stations for the water quality monitoring.

2.4 Environmental Mitigation and Implementation Schedule (EMIS)

2.4.1 Under the requirement of environmental permit, an EMIS should be prepared for each Works Area before commencement of works and the mitigation measures should be

fully implemented throughout the whole construction period. The condition would be checked by the Contractor's Environmental Team (CET) at the weekly site inspection and the Independent Environmental Checker (IEC) at the monthly audit and would be reported in the monthly EM&A reports. The updated EMIS would be presented in Appendix C for easy reference.

3. SUMMARY OF NONCOMPLIANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS AND FOLLOW-UP ACTIONS TAKEN IN THE EVENT OF NONCOMPLIANCE

3.1 Noise

3.1.1 No noise exceedance was noted in this reporting quarter, however the site team was reminded to the mitigation measures in respect of noise should be well implemented at all works areas.

3.2 Air Quality

3.2.1 In this reporting quarter, there was no 1-hour TSP exceedances and 24-hour TSP exceedances recorded according to the Action and Limit Levels established from the baseline monitoring results. Even though there was no exceedance recorded, the site team was reminded to fully implement the mitigation measures in order to minimize the impacts to the vicinity sensitive receivers.

3.3 Water Quality

3.3.1 For the water quality, one dissolved oxygen (DO) and one pH exceedance in total at the monitoring station RS1 were found in this reporting quarter. At the monitoring station RB1, two turbidity, six pH and three suspended solids (SS) exceedances were recorded in this reporting quarter. And nine pH, one DO and two turbidity exceedances were logged in this reporting quarter.

3.3.2 The main attributes were the natural variations since there were no significant activities observed at the upstream of the rivers or channel. The wastewater generated from the works areas was treated properly before discharge. Therefore the site was concluded in good conditions within the reporting quarter.

3.3.3 Besides, all the monitoring results for Oil & grease were complied with the Action and Limit Levels.

3.4 Summary

3.4.1 Exceedances were found on most of the monitored parameters for water quality, however the conditions were recovered and reported in the follow-up actions. But the site team were advised to continue and maintain all recommended mitigation measures as stated in the EMIS in order to alleviate the potential impact incurred from the ongoing construction activities. The graphical plots of the trends of the monitored parameters in this reporting period would be included Appendix A.

4. WASTE MANAGEMENT

4.1 Summary of Spoil Disposal

4.1.1 Excess excavated materials and spoils of 11,310m^3 were disposed by dump truck to Kai Tak Public Filling Barging Point (KTPF) in this reporting quarter. This designated dumping point is agreed with Civil Engineering Department (CED) during the discussion in late December 2002.

4.1.2 On the other hand, in order to make maximum use of suitable materials available rather than go to the public fill, approximate 9,200m^3 excess excavated spoils were went to the EPD's project of Development, Management of NENT Landfill (Contract No. EP/SP/12/92). About 27,500m^3 of excavated spoil was delivered to DSD Contract DC/2001/09 – San Tin Eastern Main Drainage Channel, 20,000m^3 of excavated spoil was transported to another ERE Contract LCC202 – West Section Alignment and Associated Works.

4.1.3 In addition, around 3,700m^3 of excavated spoil was transported to the Works Areas under our contract for backfilling.

4.2 Other wastes

4.2.1 Approximate 700m^3 of construction and demolition (C&D) waste was delivered to North East New Territories Landfill Site (NENT); and waste generated from the site clearance and demolition of 20m^3 was sent to Tuen Mun Public Filling Site (Area 38) in this reporting quarter.

4.2.2 Finally, about 10,500L chemical waste (mainly lubricant) was collected and disposed of by our employed licensed chemical waste collector in this reporting quarter.

4.2.3 All the above- captioned figures are up to 30 September 2003 and summarized in Table 4.1 for easy reference.

Table 4.1 Summary of Waste Disposed of in the reporting quarter (July to September 2003)

Type of disposal	Quantity during the reporting period	Handling Method	Remarks
Excavated Spoil	11,310 m^3	Delivered to public barging point for the government approved public filling barging point	
	56,700 m^3	Delivered and reused at approved alternative sites	
	3,700 m^3	Delivered and reused at our own works areas	
C & D Waste (inert waste)	700 m^3	Delivered to public barging point for the government approved public filling barging point	
C & D Waste (non inert waste)	20 m^3	To be collected by licensed waste collector for disposal	
Chemical Waste	10,500 L	Collected by licensed waste collector for disposal	
Contaminated Spoil	0 m^3	To be collected by licensed waste collector for disposal to the government approved landfill site	

5. SUMMARY OF COMPLAINTS, SUMMONS AND PROSECUTIONS

5.1 Complaints

5.1.1 Two public complaints were received in this reporting quarter. Details of the complaint and the follow up action undertaken were summarized as follows:

i. The first public complaint was received on 21 July 2003 from a resident in Kwu Tung complained that the muddy water was flowed into the storm drainage along the road at the site access near the football playground (near the Elderly Homes). Immediate improvement was acted that all vehicles should not allow washing the vehicle outside the site entrance and instruction was given to all frontline workers.

ii. The second public complaint was transferred from ERE Contract LCC300. The complaint was received on 22 September 2003 from a resident in Chau Tau complained that the dust emission from construction site at Lok Ma Chau Road due to heavy traffic load from dump trucks. However due to the investigation by LCC300, the potential cause of problem was the disposal of spoils from dump trucks from LDB201 to LCC202. But all mitigation measures, such as covered well the dump trucks with tarpaulin, passing through the wheel wash facilities and manual wash the wheel again before leaving the site, were fully implemented. Moreover the condition will monitor and proper measures would be provided to minimize the impact from our activities, if necessary.

5.2 EPD Warnings

5.2.1 Two EPD warnings (yellow notice) were obtained from their visit on 28 July 2003 and 15 September 2003 respectively and summarized in the following. Besides the follow up action undertaken to solve the problem was presented in the following as well.

i. The first warning regarded the improper storage of chemicals and chemical wastes in the TBM Workshop Area, however proper storage area was set up and corrected labeling was given to all oil drums which stored in the storage area one week after the problem raised.

ii. The second warning regarded that the surface runoff with high SS overflowed from reception tank of two AquaSed System. As checked, the visit was conducted under the heavy rain. However appropriate mitigation measures would be implemented on site to minimize the impacts when the same condition occurs in the future. For example, cover the exposed surface once with tarpaulin involving the stockpiles and slope surface when raining or properly when not in use; pump the water to the temporary storage tanks and clean the channel regularly.

6. COMMENTS AND CONCLUSIONS

6.1.1 The monitoring results in this reporting quarter revealed that 100% of the noise measurements, 1-hour TSP and 24-hr TSP results complied with the Action and Limit Levels. The compliance rate on the water quality monitoring was 71%. The exceedances were mainly caused by the natural variations since there were no significant activities observed at the upstream of the rivers or channel and the wastewater generated from the works areas was treated properly before discharge.

6.1.2 However, in general, the third quarterly construction activities were not found to create too much nuisance to the adjacent sensitive receivers. All recommended mitigation measures and preventive actions as stated in the EMP were effective and fully implemented on site continually.