Highways Department

Route 8 (previously known as Route 9) between Cheung Sha Wan & Sha Tin

Contract No. HY/2003/10 - Environmental Team for Lai Chi Kok Viaduct and Eagle's Nest Tunnel

Quarterly EM&A Report
Part II – Eagle's Nest Tunnel and Associated Works
(Version 1.0)

June to August 2004

Approved By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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EXECUTIVE SUMMARY

- This is the third Quarterly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the "Route 8 (previously known as Route 9) between Cheung Sha Wan & Sha Tin, Lai Chi Kok Viaduct & Eagle's Nest Tunnel". This summary report documents the findings of EM&A works performed in the period between June 2004 and August 2004 for Contract No. HY/2003/02, Route 8 Eagle's Nest Tunnel and Associated Works (the Project).
- The construction activities undertaken in the reporting quarter were:
 - Slope cutting;
 - Haul road construction;
 - Probing by Jumbo;
 - Directional drill hole;
 - Soil nail installations;
 - Preparation for direction drill;
 - Canopy construction;
 - Excavation works.
 - Stepped channel and box culvert construction;
 - Site investigation; and
 - Blasting works at Portals.

Environmental Monitoring Works

- Environmental monitoring for the Project was performed regularly as stipulated in the EM&A Manuals and the results were checked and reviewed. Environmental site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
- Summary of the events and action taken in the reporting quarter is tabulated in **Table I**.

1-hr TSP Monitoring

- All 1-hr TSP monitoring was conducted as scheduled in this reporting quarter.
- One Action Level exceedance was recorded at AM3 (Garden Villa) on 12th August 2004. The exceedance was considered due to traffic dust and not related to the project works. One Limit Level exceedance was recorded at AM3 (Garden Villa) on 17th August 2004. The exceedance was considered due to poor ambient air quality and not associated with the project works.

24-hr TSP Monitoring

• All 24-hr TSP monitoring was conducted as scheduled in this reporting quarter, except that the monitoring at AM3 on 31st July 2004 was rescheduled to 2nd August 2004 due to mechanical failure of the TSP monitoring equipment.

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No Action/Limit Level exceedance was recorded in this reporting quarter.

Table I Summary Table for Events Recorded in the Reporting Quarter

Danam et en	No. of	Events	No. of Events	Action Taken			
Parameter	Action Level	Limit Level	Due to the Project				
June 2004							
1-hr TSP	0	0	0	N/A			
24-hr TSP	0	0	0	N/A			
Noise	0	0	0	N/A			
July 2004							
1-hr TSP	0	0	0	N/A			
24-hr TSP	0	0	0	N/A			
Noise	0	0	0	N/A			
August 2004							
1-hr TSP	1	1	0	N/A			
24-hr TSP	0	0	0	N/A			
Noise	0	0	0	N/A			

Construction Noise

Noise monitoring was performed at the four designated locations during the daytime period (0700 to 1900) as schedule in this reporting quarter. Restricted hours (Sunday) monitoring was conducted for 1 occasion at NM6. No Action Level (noise complaint received) / Limit Level exceedance was recorded in the reporting period.

Environmental Licensing and Permitting

Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project, Construction Noise Permits (CNPs) and Water Discharge Licenses (WDLs). The Contractor had also registered as a Chemical Waste Producer.

Key Information in the Reporting Quarter

Summary of key information in this reporting quarter is tabulated in Table II.

Table II Summary Table for Key Information in the Reporting Quarter

Event	Event Details		Action	Status	Remark	
Event	Number	Nature	Taken	Status	Kemark	
Complaint received	0		N/A	N/A		
Changes to the assumptions and key construction / operation activities recorded	0		N/A	N/A		
Status of submissions under EP	0		N/A	N/A		
Notifications of any summons & prosecutions received	0		N/A	N/A		

Future Key Issues:

Major site activities for the coming month include:

- Slope cutting;
- Haul road construction;
- Site investigation;
- Directional drill hole;
- Soil nail installations;
- Stepped channel and box culvert construction;
- Blasting works at Portals;
- Preparation for direction drill; and
- Erection of blasting door.

The anticipated environmental impacts will be mainly on dust and noise due to the slope works.

1. INTRODUCTION

- 1.1 Route 9 (Kowloon Section) (R9K) (hereinafter call the R9K-Project) forms part of the Route 9 between Cheung Sha Wan and Sha Tin (R9-CSWST) project, which will be a new expressway connecting West Kowloon and Sha Tin. It will be the fourth external link between Sha Tin and Kowloon and will form an important link between the northeast New Territories and the west Kowloon, Lantau Island and the western New Territories. R9K is being managed and implemented by the Highways Department (HyD).
- 1.2 The engineering design of R9K is covered under Agreement No. CE 50/98 "Route 9 between Cheung Sha Wan and Sha Tin Design Construction Assignment". The main consultant engaged under Agreement No. CE 50/98 is Maunsell Hyder Joint Venture (MHJV), who will act as the Engineer for the construction contracts. The works of R9K mainly comprise a 1.4km dual 3-lane Lai Chi Kok Viaduct from Lai Wan Interchange to Butterfly Valley; 0.5 km of dual 3-lane at-grade carriageway linking to the 2.1 km dual 3-lane twin-bore Eagle's Nest Tunnel with associated portal buildings; a toll plaza with an administration building located with the Sha Tin valley woodland; a ventilation building and an adit; associated noise barriers, noise enclosures, drainage, slope and landscape works; and electrical and mechanical works for the whole R9-CSWST. The remainder of the R9-CSWST forms the Sha Tin Section (R9S) of the project and is being managed and implemented separately by the Civil Engineering and Development Department (CEDD).
- 1.3 The R9-CSWST project is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 449) (EIAO). An environmental impact assessment (EIA) report has been prepared in 1998 for the R9-CSWST project (1998 R9 EIA) to consider the key issues of noise, air quality, water quality, ecological, construction waste, landscape and visual, land use and cultural impacts, and identify possible mitigation measures.
- 1.4 An Updated Final EIA report was subsequently competed in August 1999 for the R9-CSWST project (1999 R9 EIA), to cater for some changes in R9K portion as mentioned in paragraph 1 in the report. The 1999 R9 EIA was endorsed by Environmental Protection Department (EPD) in November 1999. The 1998 R9 EIA and the 1999 R9 EIA (R9 EIA Reports) were included in the EIA register under the EIAO as report no. EIA-135/BC and AEIAR-022/1999 respectively. An Environmental Monitoring and Audit (EM&A) Manuals for each of the R9 EIA Reports (EM&A Manuals) were also included as part of the EIA reports in the register.
- 1.5 Subsequent to the endorsement of the R9 EIA Reports by EPD in November 1999, the project programme was deferred to start in 2002/2003 for completion by 2006/07. The implementation of the project was then separated into the R9S and R9K portion. An Environmental Permit (EP) No. EP-103/2001 was issued on 17 September 2001 for R9K to the HyD as Permit Holder. A revised EP No. EP-103/2001/A was issued on 20 May 2003 for R9K (R9K EP) to HyD as Permit Holder.

- Eagle's Nest Tunnel and Associated Works (HY/2003/02) EM&A Quarterly Report for June to August 04
- 1.6 Two civil works contracts of the R9K project, Contract No. HY/2003/01 entitled "Route 9 Lai Chi Kok Viaduct" and Contract No. HY/2003/02 entitled "Route 9 Eagle's Nest Tunnel and Associated Works", were commenced in 15th December 2003 for completion in April 2007.
- 1.7 "Route 9" was recently re-titled as "Route 8 (previously known as Route 9)". Cinotech Consultants Limited (Cinotech) was commissioned by HyD to undertake the Environmental Monitoring and Audit works for "Route 8 (previously known as Route 9) between Cheung Sha Wan and Sha Tin Environmental Team (ET) for Lai Chi Kok Viaduct and Eagle's Nest Tunnel (Contract No. HY/2003/10)". Dr. Priscilla CHOY of Cinotech was appointed as the ET Leader under Condition 2.2 of the EP. Mr. David YEUNG of CH2M-IDC Hong Kong Ltd. was appointed as the IEC under Condition 2.1 of the EP. This is the third quarterly EM&A report summarizing the EM&A works for the ENT Project between June 2004 and August 2004.

2 PROJECT CHARACTERISTICS

Project Organization and Contacts of Key Management

An organization structure and the line of communication were set up for the Project between the Project Proponent, Engineer's Representative (ER), Independent Environmental Checker (IEC), the Contractor and Environmental Team (ET). The organization chart and contact details are shown in **Appendix A** and **Figure 2**.

Construction Programme and Synopsis of Work

2.2 The construction programme is presented in **Appendix B**. The site activities during the reporting period are summarized in **Table 2.1**.

Table 2.1 Summary of Works Undertaken in the Reporting Period

Item	Work Activity	Month		
Item	Work Activity	Jun 04	Jul 04	Aug 04
1.	Slope cutting	✓	✓	✓
2.	Haul road construction	✓	✓	✓
3.	Probing by Jumbo	✓	✓	✓
4.	Directional drill hole	✓	✓	✓
5.	Soil nail installations	✓	✓	✓
6.	Preparation for direction drill	✓	✓	✓
7.	Canopy construction	✓	✓	✓
8.	Excavation works	✓	✓	✓
9.	Stepped channel and box culvert		√	√
	construction			
10.	Site investigation			✓
11.	Blasting works at Portals		√	✓

3 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

3.1 The EM&A Manuals designated locations for the ET to monitor environmental impacts in terms of noise and air quality due to the Project. The Project area and monitoring locations are depicted in **Figures 1a** and **1b**. **Appendix C** gives details of monitoring requirements.

Monitoring Methodology and Calibration Details

3.2 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manuals. Copies of calibration certificates are attached in the appendices of the Monthly EM&A Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

3.3 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective Event Action Plans would be implemented. The Action/Limit Levels for each environmental parameter are provided in **Appendix D**.

Environmental Mitigation Measures

3.4 Relevant mitigation measures as recommended in the project EIA report have been stipulated in the EM&A Manuals for the Contractor to implement. A list of mitigation measures is given in **Appendix G**.

4 MONITORING RESULTS

Weather Conditions

4.1 The weather during monitoring sessions was mainly sunny or cloudy. The weather conditions for each individual monitoring session were presented in the field record sheets.

Air Quality

1-hr TSP Monitoring

- 4.2 All 1-hr TSP monitoring was conducted as scheduled in this reporting quarter.
- 4.3 One Action Level exceedance for 1-hr TSP monitoring was recorded at AM3 (Garden Villa) on 12th August 2004. As observed by the monitoring staff, no major dust source was identified in the nearby construction sites and the dust collected by the filter appeared black in colour. Thus, the exceedance was considered due to the traffic dust on Tai Po Road and not related to the project works. On 13th August 2004, a continual measurement was carried out with similar construction activities undertaken as on 12th August. No exceedance was recorded, which showed that the exceedance recorded on 12th August 2004 was not related to the Project works.
- 4.4 One Limit Level exceedance for 1-hr TSP monitoring was recorded at AM3 (Garden Villa) on 17th August 2004. As observed by the monitoring staff, smog was observed during the monitoring event. The results of 1-hr TSP monitoring for another EM&A Projects on the same day were also found to be abnormally high, especially in Sha Tin and Yuen Long areas. Thus, the exceedance was considered due to the poor ambient air quality but not the project works. On 19th August 2004, a continual measurement was carried out with similar construction activities undertaken as on 17th August. No exceedance was recorded, which showed that the exceedance recorded on 17th August 2004 was not associated with the Project works.
- 4.5 The exceedances recorded in the reporting quarter and the associated actions taken are summarized in **Appendix J**.

24-hr TSP Monitoring

- 4.6 All 24-hr TSP monitoring was conducted as scheduled, except that the monitoring at AM3 on 31st July 2004 was rescheduled to 2nd August 2004 due to mechanical failure of the TSP monitoring equipment.
- 4.7 No Action / Limit Level exceedance was recorded for 24-hr TSP monitoring in the reporting quarter.

4.8 The monitoring data of 1-hr and 24-hr TSP Levels are attached in the appendices of the Monthly Reports for June to June 2004. The graphical presentations of the monitoring results are shown in **Appendix E**.

Construction Noise

- 4.9 Noise monitoring was performed at the four designated locations during the daytime period (0700 to 1900 hours) as schedule in this reporting quarter. Restricted hours (Sunday) monitoring was also conducted for 1 occasion at NM6. No Limit Level exceedance was recorded in the reporting period.
- 4.10 No public complaint on noise issue was received, thus no Action Level exceedance for construction noise was recorded in the reporting quarter.
- 4.11 The major noise sources identified at the designated stations were traffic noise.
- 4.12 All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured Leq Baseline Leq = Measured CNL), in order to facilitate the interpretation of the noise exceedance. The baseline noise level at each designated noise monitoring station is presented at **Table 4.1**.
- 4.13 The monitoring data of construction noise are attached in the appendices of the Monthly Reports for June to August 2004. The graphical presentations of the monitoring results are shown in **Appendix F**.
- 4.14 Construction noise exceedances recorded in the reporting quarter and the associated actions taken are summarized in **Appendix J**.

Table 4.1 Baseline Noise Levels at Each Noise Monitoring Station

	Baseline Noise Level, dB(A)			
Station	0700-1900 on	1900-2300 on weekdays	2300-0700 on	
	weekdays	/ 0700-2300 on holidays	any days	
NM1 - Yew Chung International School / PKL Choi Kai Yau School	61.5	60.3	58.3	
NM5 – Villa Carlton	77.1	75.8	71.9	
NM6 – Government Quarters	70.1	56.1	52.8	
NM7 – Garden Villa	59.0	58.3	50.6	

5 ENVIRONMENTAL AUDIT

Implementation Status of Environmental Mitigation Measures

According to the Environmental Permit and the EM&A Manuals, the mitigation measures detailed in the documents are required to be implemented. An updated summary of the Environmental Mitigation Implementation Status (EMIS) is provided in **Appendix G**.

Site Audit Summary

- ET's weekly site audits were conducted on 2nd, 10th, 16th, 23rd and 30th June 2004, 8th, 14th, 20th and 28th July 2004, 4th, 12th, 18th and 24th August 2004. IEC's monthly site audits were conducted on 10th June 2004, 8th July 2004 and 12th August 2004 together with ET. An ad-hoc site inspection was also performed by IEC on 22nd July 2004.
- 5.3 During site inspections in the reporting period, no non-conformance was identified. The observations and recommendations are summarized in **Table 5.1**.

Table 5.1 Observations and Recommendations of the Site Audits

Parameters	Date	Observations / Recommendations	Remedial Actions
Water Quality	10-Jun-04	Exposed slope surface was observed at Mui Kong Tsuen. The Contractor was reminded to entirely cover all the slopes.	Rectification was observed during the site audit on 17-Jun-04.
	10-Jun-04	Sand / silt were accumulated in the sand traps at Mui Kong Tsuen. The Contractor was recommended to maintain the de-silting system properly.	Rectification was observed during the site audit on 17-Jun-04.
	10-Jun-04	Sand / silt were accumulated in the sand trap at South Portal. The Contractor was recommended to clear the sand in the sand trap and also the mud on the haul road to prevent muddy surface runoff discharge into the stream.	Rectification was observed during the site audit on 17-Jun-04.
	10-Jun-04	The washout of shotcrete machine was discharged on bare ground. The Contractor was reminded to collect the washout and divert to treatment system for neutralization before discharge.	Rectification was observed during the site audit on 17-Jun-04.
	17-Jun-04	The surface runoff control measures at South Portal were considered inadequate. The Contractor was recommended to entirely cover exposed slope surfaces and well stabilize / compact the haul road.	Rectification was observed during the site audit on 23-Jun-04.
	22-Jul-04	Some sand and mud accumulated in the catchpit and U-channel at the Miu Kong Tsuen site entrance.	Rectification was observed during the site audit on 28-Jul-04.

Parameters	Date	Observations / Recommendations	Remedial Actions
Water Quality	28-Jul-04	Accumulation of silt was observed in the sand trap near the ultimate discharge point at Portion H4 of Ventilation Adit. Some rubbish was also observed there. The Contractor was reminded to clear the silt and rubbish as soon as possible.	Rectification was observed during the site audit on 04-Aug-04.
	24-Aug-04	A large quantity of muddy water was noted discharging into the 3-cell box culvert at Portion A in Mui Kong Tsuen area.	Situation would be followed up in September 04.
Air Quality	02-Jun-04	Two dump trucks (LJ6884 & CF3221) were observed leaving the site of Mui Kong Tsuen without covering the transported materials.	-
	02-Jun-04	The Contractor was reminded to shelter the grout mixer at South Portal on the top and 3 sides during cement mixing operations.	Rectification was observed during the site audit on 10-Jun-04.
	10-Jun-04	The haul road at South Portal being connected to Mui Kong Tsuen was observed dry. The Contractor was reminded to enhance dust suppression measures there.	Rectification was observed during the site audit on 17-Jun-04.
	17-Jun-04	Excessive dark smoke emission from a drilling rig was observed at Mui Kong Tsuen. The Contractor was reminded to use well-maintained machinery on site.	Rectification was observed during the site audit on 23-Jun-04.
	17-Jun-04	The grout mixer at North Portal was not sheltered adequately (on the top and 3 sides) during operation. Immediate actions taken by the Contractor were observed during the audit.	Rectification was observed during the site audit on 23-Jun-04.
	17-Jun-04	The Contractor was reminded to water-spray the waste cement bags before disposal to avoid dust emission.	Rectification was observed during the site audit on 23-Jun-04.
	23-Jun-04	Excessive dark smoke emission from a drilling rig and an excavator was observed at South Portal. The Contractor was reminded to use well-maintained machinery on site.	Rectification was observed during the site audit on 30-Jun-04.
	08-Jul-04	Deposition of mud and sand was observed at the site entrance of South Portal. The Contractor was reminded to clear the mud immediately.	Rectification was observed during the site audit on 14-Jul-04.
	14-Jul-04	No dust suppression measure was provided for the concrete breaking activity in Portion D1. The Contractor was recommended to provide water spray during the breaking operation to avoid dust emission.	Immediate action was taken by the Contractor during the audit session.
	14-Jul-04	The works area in Portion D4 was observed dry. The Contractor was reminded to apply sufficient dust suppression measures in this area, especially for the haul roads and stockpiled materials.	Rectification was observed during the site audit on 20-Jul-04.

Lai Chi Kok Viaduct & Eagle's Nest Tunnel Eagle's Nest Tunnel and Associated Works (HY/2003/02) EM&A Quarterly Report for June to August 04

Parameters	Date	Observations / Recommendations	Remedial Actions
Air Quality	04-Aug-04	Fugitive dust emission was observed during the drilling operation at Portion I1, though water spray was applied by the Contractor. The Contractor was recommended to enhance the dust suppression measure for the operation.	Rectification was observed during the site audit on 12-Aug-04.
	18-Aug-04	Dark smoke emission from an excavator was observed at Portion H1 in South Portal. The Contractor was reminded to use well-maintained plants on site.	Rectification was observed during the site audit on 24-Aug-04.
Noise	22-Jul-04	No CNP was displayed at the North Portal site entrance.	Rectification was observed during the site audit on 28-Jul-04.
	12-Aug-04	No noise emission label (NEL) was affixed on the air compressor, which was not in use, in Ventilation Adit. The Contractor was reminded to affix the NEL before using the air compressor.	Rectification was observed during the site audit on 18-Aug-04.
Waste / Chemical Management	23-Jun-04	It was observed that an oil drum was placed on bare ground at Ventilation Adit. The Contractor was reminded to provide a drip tray for the drum as soon as possible.	Rectification was observed during the site audit on 23-Jun-04.
	08-Jul-04	Two oil drums were placed on bare ground in Ventilation Adit. The Contractor was reminded to provide trip tray for the drums as soon as possible.	Rectification was observed during the site audit on 14-Jul-04.
	20-Jul-04	Oil leakage was observed at Portion II. The Contractor was reminded to remove the oil and contaminated soil as soon as possible. The Contractor was also reminded to provide proper storage area for chemical / chemical waste.	Immediate action was taken by the Contractor during the audit session.
	22-Jul-04	Oily water accmualted in the drip tray and some oil stain on ground was found at the ventilation adit area.	Rectification was observed during the site audit on 28-Jul-04.
	28-Jul-04	At Portion H4 of Ventilation Adit, oil leakage from an air compressor was observed. The Contractor was recommended to use well-maintained plant on site.	Rectification was observed during the site audit on 04-Aug-04.
	30-Jun-04	Rubbish scattering was observed on the slopes at Portion I1.	Rectification was observed during the site audit on 04-Aug-04.
	18-Aug-04	At <u>Portion D1</u> in North Portal, oil leakage was observed from an excavator during maintenance. Immediate action was taken by the Contractor to rectify the problem.	Rectification was observed during the site audit on 24-Aug-04.

Status of Environmental Licensing and Permitting

5.4 Environmental licenses and permits including the Environmental Permit for the Project were in place and valid during the reporting quarter. The status of all licenses and permits obtained for the Project is summarized in Appendix H.

6

NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS (ACTION AND LIMIT LEVELS)

Summary of Exceedances

1-hr TSP monitoring

One Action Level exceedance was recorded at AM3 (Garden Villa) on 12th August 2004. The exceedance was considered due to traffic dust and not related to the project works. One Limit Level exceedance was recorded at AM3 (Garden Villa) on 17th August 2004. The exceedance was considered due to poor ambient air quality and not associated with the project works.

24-hr TSP Monitoring

6.2 No Action / Limit level exceedance was recorded in the reporting quarter.

Construction Noise Monitoring

6.3 No Action Level (noise complaint received) / Limit Level exceedance was recorded in the reporting quarter.

Review of the Reasons for and the Implications of Non-compliance

6.4 There was no non-compliance from the site audits in the reporting quarter. As mentioned previously in the Section 5.2 of this report, the observations and recommendations made in each individual site audit session were presented.

Summary of Actions Taken

- 6.5 In this reporting quarter, the following mitigation measures were implemented:
 - drip trays for oil storage of oil buckets have been provided;
 - excavated/dusty materials have been covered by tarpaulin or water sprayed:
 - wheel washing facilities have been provided; and
 - frequent watering the work area has been provided.

7 ENVIRONMENTAL COMPLAINTS

- 7.1 No environmental related complaint was received in this reporting quarter.
- 7.2 There was one complaint received since the Project commencement. The complaint has been handled in accordance with the EM&A Manuals. The implementation status of the complaint handling procedure is summarized in **Appendix I**.

8 NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

- 8.1 No notification of summon or successful prosecution was recorded in this reporting quarter.
- 8.2 There was no notification of summon or successful prosecution received since the Project commencement.

9 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

- 9.1 Major site activities for the coming month include:
 - Slope cutting;
 - Haul road construction;
 - Site investigation;
 - Directional drill hole;
 - Soil nail installations;
 - Stepped channel and box culvert construction;
 - Blasting works at Portals;
 - Preparation for direction drill; and
 - Erection of blasting door.
- 9.2 The anticipated environmental impacts will be mainly on dust and noise due to the slope works